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The role of knowledge management approaches for enhancing and supporting education

Mansour Alosaimi

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Mansour Alosaimi. The role of knowledge management approaches for enhancing and supporting education. Business administration. Université Panthéon-Sorbonne - Paris I, 2016. English. NNT : 2016PA01E064 . tel-01816021

HAL Id: tel-01816021

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Université Paris 1 PANTHÉON-SORBONNE

**Ecole de MANAGEMENT DE LA SORBONNE –
GESTION & ECONOMIE D'ENTREPRISE**

ECOLE DOCTORALE DE MANAGEMENT PANTHÉON-SORBONNE

**The Role of Knowledge Management Approaches for
Enhancing and Supporting Education**

Thèse pour l'obtention de DOCTORAT en Sciences de Gestion

Présentée et Soutenue le 12/7/2016

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DEDICATION

This research thesis is dedicated to my Father, Daifallah ALOSAIMI, who passed away quite a long time ago but his unending love and support have always stayed with me. Also to my mother, Norah ALOSAIMI, without the determination, strength and energy she has given me, I might not have been able to overcome all difficulties to successfully complete the thesis. I should not forget my sincere wife, Zakiah ALOSAIMI, who stands behind every success I have in my life. My sons and daughters also support me a lot.

ACKNOWLEDGEMENT

I would like to acknowledge the people whose contribution and assistance have made this research possible. First, I wish to express my immense gratitude to Dr. Farouk HEMIC for his invaluable advice, encouragement and support not only in completing this research project but also in developing my research career. Dr. Farouk, thank you very much for assisting me to conduct different activities to complete my research.

Second, I would like to sincerely thank Prof. Alain KOKOSOWSKI for his comments on my data collection, research methodology and review of my data analysis. I am also very grateful to Prof. Mohamed JEMNI for his valuable assistance and enthusiasm that have given me the support and the feeling to tolerate a number of obstacles specially the technical ones. I am deeply grateful to Dr. Suzanne GRANT LEWIS who is chairing the jury, I am sure her guidance and suggestions are of great value. Many others should not be forgotten for their support and advices and one of them is Ms Virginia DURTERTRE, *ED Secretariat - DU CGPP Manager*, for her valuable assistance and friendliness.

In addition, I must say thanks to the Saudi Ministry of Education which facilitated the implementation of the research instruments to pursue this doctoral thesis. I would like to thank the Delegation of Saudi Arabia to UNESCO in Paris, Dr. Ziad ALDREES for his kind assistance and support. Thanks also extended to Dr. Sulaiman ALKRAIDA and Mohammad ALKURAIZI who assisted me in implementing the research instruments in Saudi schools and finalizing the logistics affairs in Saudi Arabia while I am away from the country, based here in Paris.

Finally, I would like to acknowledge the emotional support of my mother, and my brothers and my sisters. I must particularly thank my wife for her patience and allowing me the time and efforts to do all requirements of the research in a lively atmosphere. Her consistent, strong belief in my ability instilled in me the self-confidence and great motivation to achieve success. But my greatest debt of gratitude is to our sons and daughters who have always been my companion through the ups and downs of the long and tough journey. I have vented my frustrations and stresses on them many times but they have always been there for me with their unending love and support and I will always be thankful.

ABSTRACT

(English)

The New Economy is characterized by properties such as globalization, intangibility and inter-connectivity. Educational organizations are required to overcome the new challenges, especially the changing nature of the enhanced dynamism and complexity of the requirements from the educational organizations. One of the current strategic philosophies assisting educational organizations to develop strategic capabilities dealing with uncertainty is knowledge management (KM). Through the systematic acquisition, creation, sharing, and use of knowledge, organizations develop, renew and exploit their knowledge-based resources, thereby allowing them to be proactive and adaptable to external changes and attain competitive success.

Emerging as a powerful means for sustaining organizational competitiveness, KM has been widely investigated from different perspectives. However, only a limited number of researches have adopted the resource based view of the educational organizations to empirically examine the relationships between KM infrastructure and the different strategies for investing human assets. Meanwhile, research on KM approaches from a dynamic capability approach has been mostly conceptual in nature. It is proposed here that a failure to apply KM approaches may hinder the potentially valuable integrated contribution to organizational strategies for enhancing education of the major components that constitute KM approaches. In addition, a review of the literature shows that most empirical evidence has been obtained in the context of developed countries. The possibility that such models might be adopted in educational organizations to fit the specificities of the developing countries has received very little attention to date.

Relying on social learning theory extended by the knowledge and dynamic capability based approaches, this research develops an integrative theoretical model of KM capability. Empirical examination of the hypothesized relationships among variables is conducted by means of questionnaire surveys in Saudi Arabia. For the pilot study, 30 draft questionnaires

were directly distributed to senior managers participating in the *Global Knowledge Society Forum 2013* took place in *King Abdul Aziz Center for World Culture, ARAMCO* Saudi Arabia, during the period of 9-10 December 2103. The responses returned with complete data were assessed, using factor analysis and reliability testing, to refine and finalize the questionnaire administered in the main survey. Next, final questionnaires were posted to 200 knowledge workers selected from the Saudi Schools. Only 143 returned and then they were analyzed. The processes of data collection for the pilot and main surveys were conducted by the researcher.

The data collected from the main survey were initially assessed for missing values, sample descriptive and normality testing using SPSS version 15.0. SPSS allows the researcher to assess the contribution of each scale item, incorporate how well the scale measures the concept and estimate the relationship between the independent and dependent variables. The results of the analyses indicated that the proposed measurement model and structural model satisfied the necessary fit conditions. Therefore, the four research hypotheses were tested to address the research problem.

The empirical evidence confirms that the model is workable in the educational context. The findings confirm that the KM capability is a multi-dimensional construct composed of social KM infrastructure capability, technical KM infrastructure capability, and KM process capability. Social KM capability is identified by three dimensions: organizational culture, organizational structure and people (or T-shaped skills). KM process capability is identified by four dimensions, namely knowledge acquisition, conversion, application and protection processes. While social and technical KM infrastructure capabilities are strongly correlated, they are both enablers for KM process capability with social elements having a dominant influence. KM processes as dynamic capabilities take the central role with application process as the most important contributor to firm competitiveness. As a result, the indirect effects of social and technical infrastructure capabilities on organizational CA are fully mediated through KM process capability.

The research attempts to provide a variety of practical recommendations for manager in different levels, especially those operating in educational organizations, to

be successful in applying KM projects to the attainment of strategic objectives. Management, on the one hand, should follow and develop a holistic approach by starting with the development of social and technical KM infrastructure which, in turn, will provide the platform necessary for increasing the effectiveness and efficiency of KM processes. The correlated and complementary factors of KM capability should not be considered in isolation but rather should be integrated and combined to leverage, exploit, improve and sustain organizations competitiveness. On the other hand, knowledge worker need to keep in mind that while social aspects, especially cultural attributes, have the most influence on knowledge-oriented processes, the major source of organization competitiveness rests in its ability to effectively exploit and apply integrated knowledge based resources. Therefore, more effort should be applied to developing and utilizing these factors. Within the context of Saudi Arabia, the study also suggests a number of specific implications for a supportive infrastructure of KM activities. Some limitations of the study are also indicated, suggesting opportunities for future research.

ABSTRAIT

(Français)

Dans la nouvelle économie caractérisée par des propriétés telles que la mondialisation, l'intangibilité et l'interconnectivité, les organisations éducatives sont nécessaires pour surmonter les nouveaux défis, en particulier la nature changeante du dynamisme accru et de la complexité des exigences des organisations éducatives. L'une des philosophies stratégiques actuelles aidant les organisations éducatives à développer des capacités stratégiques traitant de l'incertitude est la gestion des connaissances (GC). Grâce à l'acquisition systématique, la création, le partage et l'utilisation des connaissances, les organisations développent, renouvèlent et exploitent leurs ressources fondées sur le savoir, leur permettant ainsi d'être proactifs et adaptables aux changements extérieurs et d'atteindre le succès concurrentiel.

Apparaissant comme un moyen puissant de maintien, de la compétitivité de l'organisation, GC a été largement étudiée et ce à partir de différentes perspectives. Toutefois, seul un nombre limité de recherches ont visé les ressources des organisations éducatives pour examiner empiriquement les relations entre l'infrastructure GC et les différentes stratégies pour investir les actifs humains. Pendant ce temps, la recherche sur les approches GC à partir d'une approche dynamique a été la plupart du temps de nature conceptuelle. Il est proposé ici que l'omission d'appliquer le processus GC peut entraver la contribution intégrée, potentiellement utile aux stratégies organisationnelles afin d'améliorer l'éducation des principaux éléments qui constituent les approches GC. En outre, un examen de la littérature montre que les preuves les plus empiriques ont été obtenues dans le cadre des pays développés. La possibilité que ces modèles pourraient être adoptés dans les organisations éducatives pour répondre aux spécificités des pays en développement a reçu très peu d'attention à ce jour.

En se basant sur la théorie de l'apprentissage social prolongé par les approches basées sur la capacité des connaissances dynamiques, cette recherche développe un modèle théorique d'intégration de la capacité GC. L'examen empirique des relations hypothétiques entre les variables est réalisé au moyen de questionnaires de sondage en Arabie Saoudite. Pour l'étude pilote, 30 projets de questionnaires ont été distribués directement aux cadres supérieurs participants au forum « société Global Knowledge

2013 » qui a eu lieu au centre du Roi Abdulaziz pour la Culture Mondiale du groupe ARAMCO Arabie Saoudite, le 9-10 Décembre 2103.

Les réponses renvoyées avec des données complètes ont été évaluées, en utilisant l'analyse des facteurs et des tests de fiabilité, pour but d'affiner et de finaliser le questionnaire utilisé dans l'enquête principale. Des questionnaires définitifs ont été publiés par la suite à 200 cadres sélectionnés par des écoles saoudiennes. Seuls 143 ont été retournés et analysés.

Le processus de collecte des données pour les enquêtes pilotes et les enquêtes principales ont été menées à terme par des chercheurs.

Les données recueillies à partir de l'enquête principale ont d'abord été évaluées pour les valeurs manquantes, descriptives de l'échantillon et la normalité de test en utilisant SPSS version 15.0. SPSS permet aux chercheurs d'évaluer la contribution de chaque élément d'échelle, et d'incorporer dans quelle mesure l'échelle mesure le concept et d'estimer la relation entre les variables indépendantes et dépendantes. Les résultats d'analyse ont indiqué que le modèle de mesure proposé et le modèle structurel remplissaient les conditions d'ajustement nécessaires. Par conséquent, les quatre hypothèses de recherche ont été testées pour répondre aux problèmes de recherche.

Les données empiriques confirment que le modèle est réalisable dans le contexte éducatif. Les résultats confirment que la capacité GC est une construction multidimensionnelle composée de : GC capacité et infrastructures sociales et de GC capacités et infrastructures techniques, et la capacité des processus GC.

La capacité de GC social est identifiée par trois dimensions: la culture organisationnelle, la structure organisationnelle et les ressources humaines. La capacité des processus GC est identifiée par quatre dimensions, à savoir l'acquisition de connaissances, la conversion, l'application et les processus de protection.

Alors que les capacités d'infrastructures sociales et les capacités d'infrastructures techniques de GC sont fortement corrélées, elles sont les deux catalyseurs pour la capacité des processus GC avec des éléments sociaux ayant une influence dominante. Le processus GC traite que des capacités dynamiques et prend le rôle central avec le processus de demande comme étant le facteur le plus important

pour assurer la compétitivité. En conséquence, les effets indirects des capacités d'infrastructures sociales et techniques sur CA organisationnelle sont entièrement médités par la capacité des processus GC.

La recherche tente de fournir une variété de recommandations pratiques pour gérer dans différents niveaux, en particulier ceux qui œuvrent dans les organisations éducatives, pour le succès des projets GC. La gestion, devrait, suivre et développer une approche globale, en commençant par l'amélioration des infrastructures de GC social et GC technique. Ces derniers fourniront la plate-forme nécessaire pour accroître l'efficacité des processus GC. Les facteurs corrélés et complémentaires GC ne devraient pas être considérés séparément, mais plutôt intégrés et combinés afin d'exploiter, d'améliorer et de soutenir au mieux la compétitivité des organisations. D'autre part, les professions intellectuelles doivent garder à l'esprit que, bien que les aspects sociaux, en particulier les aspects culturels, ont la plus grande influence sur les processus axés sur le savoir, la principale source de la compétitivité des organisations repose sur sa capacité à exploiter et appliquer de façon effective les ressources fondées sur le savoir. Par conséquent, plus d'efforts devraient être déployés pour développer et utiliser ces facteurs. Dans le contexte de l'Arabie Saoudite, l'étude suggère également un certain nombre d'implications spécifiques pour une infrastructure de soutien des activités de GC. Certaines limites de l'étude sont également indiquées, pour suggérer des possibilités pour la recherche future.

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Introduction

With the growing importance of the knowledge economy, knowledge management (KM) has been recognized as a facilitated tool for sharing and utilizing knowledge in educational organizations: universities or colleges and elementary or secondary schools. We could ask whether this popularity is in spite of uncertainties about the idea of knowledge management and how it can be applied to foster professional learning. Its uses in different organizations show that it means different things according to different authors and is used in different ways. KM is the field that is concerned with the analysis and technical support of practices used in an organization to identify, create, store, share and use knowledge to adopt and leverage good practices embedded in collaborative settings in organizational knowledge processes. (Sallis & Jones, 2002)¹. *"The international trend affects economies at all levels of development. For countries in the vanguard of the world the balance between knowledge and resources has shifted so far towards the former that knowledge has become perhaps the most important factor determining the standard of living. ... Today's most technologically advanced economies are truly knowledge-based"*. (World Bank, 1998: p. 68)

Jackson, Hitt & DeNisi (2003) argue that in any competitive organization intangible resources are likely to produce knowledge, among which human capital is usually the most important because it is the most difficult to imitate. Moreover, in today's dynamic environment with its rapid and unpredictable changes, tangible assets have become easily accessible, imitable, and substitutable. As such, the foundations of organizational competitiveness have been shifting to an emphasis on knowledge (Riahi-Belkaoui 2003). According to Walters, Halliday and Glaser (2002), knowledge is considered to be the only strategic asset which increases with use rather than diminishing. The competitive edge of individuals,

¹ Edward Sallis and Gary Jones have written a book entitled: *Knowledge Management in Education*. This references deal with the technique of(KM) using the information and knowledge that is supplied to, generated by and inherent in any organization or institution, to improve its performance. It demonstrates how KM can be used in education to improve learning.

organizations, and even nations has increasingly become dependent on their ability to apply knowledge and leverage it in a continuous way (Dimitriadis 2005). In accordance with the knowledge-based view of the organization, Grant stated that "*managing knowledge-based resources has become the key for sustaining competitive advances and superior performance*" (Grant 1996: p. 33). In other words, knowledge management has emerged as a strategic philosophy assisting organization to develop strategic capabilities to deal with the enhanced dynamism and uncertainty of the business environment. Through the systematic acquisition, creation, sharing, and use of knowledge, organizations develop, renew and exploit their knowledge-based resources, thereby allowing them to be proactive and adaptable to external changes and attain competitive success.

In later formulation of knowledge management the emphasis shifts from documentation to sharing and utilizing of knowledge that has become an important tool for enhancing and supporting education. However, a critical challenge whether an educational organization can succeed or not in the transformation to knowledge societies is its ability to efficiently acquire and apply knowledge, transfer and preserve knowledge, or furthermore, create knowledge (Drucker, 1986). For example, Czuchry and Yasin emphasized that idea that "*some teachers face problems when dealing with certain educational situations due to the paucity of information available to them, not necessarily the information does not exist but because information is not easily accessible or carefully managed*". (Czuchry and Yasin, 2003: p. 42).

Given the critical role of KM in education for adding value and attaining strategic objectives for the transformation to knowledge society, this research will review relevant issues of different disciplines to draw a comprehensive picture of KM capability-based. In addition, to place the research issues in a specific context, Saudi Arabian old nation's city Qunfudah Educational Zone, was selected for analyzing the educational context. This focus has been chosen because there is a lack of studies investigating KM practices in Saudi Arabia. It has also been chosen to find out whether there is a linkage between the different KM approaches.

Currently in the process of transforming from a traditional educational school to a more knowledge-based education, Saudi Arabia has experienced the increased learning economic cooperation and integration policies that have created a more intensive and dynamic competition landscape in the country. This situation provides both great opportunities and daunting challenges for education. To develop, education should consider developing a proactive strategy towards new resources and capabilities to achieve a well-coherent transformation to knowledge society.

Educational organizations, in the meantime, have been transformed from traditional organizations to learning organizations. Information communication technology (ICT) provides the potential for enhanced access to knowledge combined with the challenge of how to manage the access to knowledge (Hawkins, 2000). Furthermore, ICT promises improvements in the quality, efficiency, and effectiveness of education process; and draws solutions from and contributes to multiple disciplines including management, information retrieval, artificial intelligence, and organizational behavior.

The Statement of the Problem

There is a consensus among researchers that KM is an evolving discipline that can be affected by new technologies and best practices. KM should be implemented systematically to have a successful implementation (Liebowitz, 1999). KM must be also integrated into an existing discipline such as community of practices, to make educational organizations as learning organizations (Wiig, 1999b; Rus and Lindvall, 2002).

Research in the field of KM is still inconclusive, especially in the area of implementing KM. A number of KM frameworks and methodologies have been suggested in the literature to provide organizations with guidance and direction of how KM should be done. However, many of these frameworks and methodologies have been criticized in the literature for suffering shortcomings; hence, there is neither a universally accepted KM framework nor methodology (Maier and Remus, 2003).

An analysis of KM failures revealed that many organizations which failed did not determine their goals and strategy before implementing KM systems

(Rus and Lindvall, 2002). Moreover, Lawton (2001) argues that more than 50 % of KM developments failed because organizations did not have a well-developed KM methodology or process. Rus and Lindvall mentioned that *"Some organizations ended up managing documents instead of meaningful knowledge. This is an easy mistake to make, because many tools advertised as KM tools address document management rather than knowledge management"*. (Rus and Lindvall, 2002: p. 231).

The importance of deploying a methodology that provides a systematic and specified process for acquiring, storing, organizing, and communicating knowledge has been recognized by an increased number of organizations. However, despite the growing interest in KM and the number of KM frameworks and methodologies proposed in the literature, which tend to emphasize different aspects of KM, yet there is a lack of commonly agreed procedures and methods to guide KM implementation. The lack of clear guidelines led to considerable confusion, especially among practitioners, regarding the question of what exactly they would have to do in order to implement KM (Maier and Remus, 2003). Thus, there is a need for a structured methodology and a framework that guide organizations in successfully implementing KM.

The problem of this study is a two-fold: first, to evaluate the practical implementation of knowledge management on creating and sharing of knowledge in the learning organizations; second to analyze the techniques for collecting, organizing and distributing knowledge.

The Proposition of the Research

As discussed above, KM is a small field for which there is no commonly agreed framework or established methodology to guide organizations in successfully implementing KM. In order to fully understand and contribute to the field of KM, a complete picture of the different KM approaches, frameworks and methodologies needs to be presented along with the various key factors affecting KM implementation and their interrelationships. This research aims to fulfil this need by analyzing the KM processes coming up with a model for the successful implementation of KM in educational organizations which integrates the various approaches and key factors to implementing KM. The KM models provide frameworks that identify the different

types of knowledge available in educational organizations, the KM cycle which is needed to manage this knowledge through the process of transferring information into knowledge , and the key factors that facilitate the transformation is the KM cycle. The model also provides management with guidance for implementing KM in their organizations.

The proposed KM model provides management in organizations with a tool that highlights the various aspects affecting KM implementation. Such a tool would assist organizations in identifying their knowledge needs as well as the current status of the various key factors affecting the successful implementation of KM in their organization. These factors are: strategy, organizational culture, people, technology, and organizational structure. This provides management with effective guidance that contributes to meeting their business objectives by achieving the critical success factors (Rockart, 1979). Management would then be in a better position to develop plans for implementing KM focusing on the weak areas and according to the organization's knowledge needs; thus, increasing the likelihood of KM success.

The Significance of the Research

The field of knowledge management has received a wider discussion to identify factors that add up to 'optimal conditions'. Townley pointed out that "*KM is an emerging area of IT practice that developed from the disciplines of computer science, library information science, organizational psychology, and management*" (Townley, 2003: p.350). KM concerns with collecting, organizing and distributing information. Ion (1999) on the other hand, argues that the development in IT domain supports KM. The significance of the study is exemplified in that it can help the:

1. KM workers through increasing storing facilities and updating of the information to facilitate knowledge management not only in education domain but to be involved in wide areas such as: cognitive sciences, organization sciences, information sciences, document management, and decision support systems as integrated to education.
2. KM workers contribute to knowledge management on creating and sharing of knowledge and to analyze the techniques of collecting, organizing and distributing knowledge in learning organizations.

The Objectives of the Research

The objective of this research is to create knowledge of a great value to the profession, to improve the professional theme and to encourage more discussion and implementation within the framework of a holistic approach for determining the goals of enhancing and supporting education. This research purports to:

1. Sharing the best-practices from both formal and informal education that are relevant to learning organizations;
2. Converting tacit knowledge of individuals into corporate knowledge assets to the maximum extent possible;
3. Providing visibility to knowledge society transformation;
4. Facilitating the above purposes through ICT, collaboration, proactive plans, knowledge-sharing activities and encouraging the formation of learning organizations fulfilling the knowledge competences that are essential to education.

The Methodology of the Research

In order to achieve the objectives of this research, a non-experimental approach is adopted using a qualitative approach; a structured interview to be used twice during writing the related literature review and building up the questionnaire and after conducting the questionnaire to elaborate some of the essential points. This is followed by a quantitative approach with the use of a questionnaire to further validate and generalize the proposed KM model. In constructing the KM model a thorough review of previous related literature from different disciplines was conducted. The literature reviewed included various issues relating to KM, such as KM approaches, perspectives, frameworks, and methodologies as well as strategic planning, human resources, instructional design theories, organizational learning, information technology and other related issues.

Definition of Terms of the Research

- **Communicative Competence:** Communicative competence is defined as the ability to use language correctly in differing social situations for various purposive functions.
- **Community of Practice (CoP)** is, according to cognitive anthropologists Jean Lave and Etienne Wenger, a group of people who share a craft and/or a profession. The group can evolve naturally because of the members' common interest in a particular domain or area, or it can be created specifically with the goal of gaining knowledge related to their field. It is through the process of sharing information and experiences with the group that the members learn from each other, and have an opportunity to develop themselves personally and professionally.
- **Data** are values of qualitative or quantitative variables that belong to a set. Data in computing (or data processing) are represented in a structure that is often tabular (represented by rows and columns) a tree (a set of nodes with parent-children relationship) or a graph (a set of connected nodes). Data are typically the results of measurements and can be visualized using graphs or images.
- **Information**, in its most restricted technical sense, is a sequence of symbols that can be interpreted as a message. Information can be recorded as signs, or transmitted as signals. Information is any kind of event that affects the state of a dynamic system that can interpret the information.
- **Knowledge** is a familiarity with someone or something, which can include facts, information, descriptions, or skills acquired through experience or education. It can refer to the theoretical or practical understanding of a subject. It can be implicit (as with practical skill or expertise) or explicit (as with the theoretical understanding of a subject); it can be more or less formal or systematic.
- **Knowledge** is a mix of framed experience, value, contextual data and expert opinion that gives an environment for evaluating and incorporating new information and experiences.

- **Knowledge management (KM)** is the process of capturing, developing, sharing, and effectively using organizational knowledge. It refers to a multi-disciplined approach to achieving organizational objectives by making the best use of knowledge.
- **Knowledge Management System (KMS)** is an IT system that store and retrieves knowledge, locate and collaborate with knowledge sources, mines repositories for hidden information, captures and uses knowledge, and enhances KM process.
- **Motivation:** motivation is defined as the factors that determine a person's desire to something. In foreign language learning, learning may be affected by motivation.
- **Task:** a unit of activity that can be used for lesson planning and evaluation, and which will also work as a unit of analysis in research by teachers or researchers coming to classroom.

Chapter I

Theoretical Studies of Knowledge management

1. Introduction

This chapter will explore the nature of knowledge management and present a proposed perspective definition from an interdisciplinary field. The terms '*data*', '*information*', and '*knowledge*' are used synonymously and the distinction between these terms is explored. Knowledge management is a relatively new discipline. It is rooted in philosophy and psychology, as well as business and management theory. It has its origin in the organizations/ companies to harness the scientific, human and intellectual capital in their disposal. The term KM in education is used to describe the application of new technology to harness the intellectual capital of the organization. Yet, Sallis and Jones draw our attention that *"KM concept is built around the idea of learning to know what they know in order to use such knowledge creatively and productively"* (Sallis & Jones, 2002: p. 4). Furthermore, Hislop adds that *"KM is considered to be an effective way to enhance the creation and sharing of knowledge within the organization. It consists of individuals collaborating to acquire knowledge suitable for the educational organizations to enhance educational programs and professional development"*. (Hislop, 2013: p 13)

KM facilitates opportunities to share visions, approaches, innovative practices, research results and analytical studies. It also facilitates institutional capacity building identified by educators in the field (Dalkir, 2011)². KM can be used also in other activities such as the piloting of new programs or setting up of database of experience of different learning situations to support competency-based reforms in education. (Wiig, 1993).

The chapter shall proceed to explore the different approaches of knowledge, taking abroad perspective and including the vital role managing knowledge in different organizations. The influence organizational culture is explained together

² See, Kimiz Dalkir (2011). Knowledge Management in Theory and Practice. Donald Hislop (2013). Knowledge Management in Organization: a critical introduction. These references deal with the depth and range of KM utilization, the key factors affect educational environments and the practice of disseminating knowledge.

with the emergence of knowledge management systems as a person-oriented initiative. Knowledge creation and dissemination is explained.

2. Knowledge

Although the three terms data, information and knowledge are different in literature, yet they are often used interchangeably in conversation. This misunderstanding may lead to sloppy thinking on the subject of knowledge. It is argued that data is located in the world and knowledge is located in agents, while information is taking place between them. Child and Ihrig view data as a "*discernible difference between different energy states valuable information for agents/ organizations*" (Child and Ihrig 2013: p. 243). Bateson (1972), on the other hand, defined such information as "the difference that makes a difference" to someone. Therefore, data is informative and it will modify an agent's expectations and dispositions to act in particular ways. The required measure to be "*knowledgeable*" is that its internal dispositions to act can be modified upon receipt of data that has some information value (Latour and Woolgar, 1986).

Based on the aforementioned arguments, it is never knowledge as such that flows between agents, but data. Some measure of resonance can be achieved between the knowledge states of two agents that are sharing the same data. But because of differences in their prior experiences as well as differences in the way that they will process the data, two agents can never achieve identical dispositions to act and hence identical knowledge states. Hence, knowledge sharing will refer to some degree of resonance being achieved between the knowledge states of two or more agents following some sharing of data among them.

Devenport and Prusak described knowledge as "*a personalized information related to facts, processes, procedures, concepts, ideas, interpretations, observations and judgments*" (Devenport and Prusak, 2000: p. 113). It is organized, collected and embedded in a context of application in a meaningful way. It is more related to doing and implying know-how and understanding of information. Meanwhile information is a contextualized, a calculated and a condensed data with relevance and purpose.

Churchland (1989) believed that knowledge is dispositional and rooted in organization, so it is not a single "thing" with easily traced contours . It is more like a set of complex activation patterns that can vary greatly from agent to agent, or from moment to moment within a single agent. Thus, how easily knowledge can be "shared," in the sense that the activation patterns of different agents can be made to resonate, they will vary from case to case as a function of its complexity. If two persons deal with the incident, there will be some overlap in the patterns of neurons that are activated in their brains. But significant differences will also occur, if one of them had some prior experiences with such incident.

Knowledge is typically divided into two types: *tacit* and *explicit*. *Tacit knowledge* is difficult to articulate and it cannot be converted into words easily. *Explicit knowledge* is the content captured and stored in tangible forms such as words, audio or video recording, images etc. Examples of explicit knowledge may be customer feedbacks, customer reactions, e-mail conversation, frequently asked questions, weak signals leading to innovation. The table below summarizes the difference between these two types of knowledge.

A comparison of Tacit and Explicit Knowledge (Dalkir 2005).

Properties of Tacit Knowledge	Properties of Explicit Knowledge
<ul style="list-style-type: none"> •Ability to adapt and deal with new and different situations. •Know-how, Know-why and care-why (Expertise). •Ability to collaborate, to share a vision, to transmit a culture. •Mentoring to transfer experimental knowledge on face-to-face basis. 	<ul style="list-style-type: none"> •Ability to disperse, to reproduce, and to reapply throughout the organization. •Ability to teach, train. •Ability to organize, to translate a vision into a mission, into operational guidelines. •Transfer of knowledge via tangible forms of method e.g. Products, services,

Child and Ihrig mentioned that the articulation of knowledge are of two kinds of cognitive efforts: *abstraction* and *codification*. "*Abstraction creates the minimum number of cognitive categories through which an individual makes sense of events*" (Devenport and Prusak, 2000: p. 268). The fewer the categories the individual needs, the more abstract its recognition the larger the number of categories it requires, the

more concrete its recognition. For example, a mathematical problem has more abstract character than a business problem. "*Codification, by contrast, refines the categories that the individual creates to use them efficiently and discriminatively*" (Devenport and Prusak, 2000: p. 269). The fewer data the individual has to process to distinguish between categories, the more codified the categories that it has to draw upon. For example, the black and white surfaces on a wall are separated by a thin straight line in which the individual has no difficulty to establish point lies within the black or the white area. If the black surface gradually fades into the white surface, then many points will lie in a gray zone that will be hard to assign to either the black or the white category. Hence, the individual will have to engage in further data processing in order to make an accurate judgement. A problem arises when much of the knowledge that is of potential value to other individual is of a more tacit nature. Knowledge resides in the heads or the behaviors of individuals, working singly or in groups

Arthur (1994) believed that most of the new knowledge today is generated in groups. The individual members of such groups may take part of the group's knowledge. He argued that the generation of much of the new knowledge is nonlinear in its effects, that is, small inputs of individual *know-how* can produce disproportionately large outputs of new knowledge and also more new knowledge created by a group than for new knowledge created by an individual. Thus, knowledge creation is sometimes subject to increasing returns.

Edvinsson particularly argued that from an intellectual capital perspective, knowledge management is about the capture, storage, and retrieval of knowledge located either in the heads or behaviors of individuals. He defined such knowledge as "*the embodiment, empowerment, and supportive infrastructure of human capital*" (Edvinsson, 1997: p. 179). Where the structural capital is the value added by the nonlinearities of the knowledge creation processed.

Knowledge management practices make organizations the natural location for knowledge creation within its boundaries. These practices aim to help the organizations appropriate an individual or group's knowledge, tacit or otherwise, by having it systematically articulated and stored. Tacit knowledge faces the challenge that the process of articulation of such knowledge can never be complete. As the

philosopher Michael Polanyi put it, "*we always know more than we can say*" (Polanyi 1958: p. 359). The abstraction and codification processes of tacit knowledge are highly selective because its nature . Only a small part of a tacit knowledge can ever be subject to articulation and structuring. Hence, much tacit knowledge inevitably stays with its possessors whatever efforts at codifying and abstracting, since tacit knowledge is derived from experience, inherited practice and implied values and beliefs (Polanyi, 1958).

For mobilization tacit knowledge, Nonaka (1995) developed a model for converting tacit knowledge to explicitly one. Individuals can create new knowledge through combining their tacit knowledge with the knowledge of others. The new knowledge is generated through reading documents from many sources which enable individuals to know what others previously learned; and also through discussing meetings, conversation, and storytelling. These efforts enable individuals to exchange their knowledge and get benefits from others' experience, and then reformulate all these activities into an explicit knowledge.

One can conclude that knowledge is what individuals know which involve the mental processes namely comprehension, understanding and learning that go on in the mind and can be enhanced by interaction with the world outside the mind, and interaction with others.

3. Knowledge Management

Knowledge management is treated differently according to different perspectives. Gambel and Blackwell argued that "*KM is a systematic management of knowledge assets of an organization with the purpose of creating value for it. Extracting novel patterns from the managed knowledge is a creative activity*" (Gambel and Blackwell, 2001: p. 71). The result of such a process meets the strategic and tactical requirements of the organization. Consequently, KM consists of the initiatives, processes and strategies and system that sustain and enhance the creation, storage, analysis, sharing and reuse of knowledge.

Moreover, Wiig (1993) argued that KM is characterized as a systematic, explicit and deliberate building, renewal and application of knowledge to maximize the organization's knowledge-related effectiveness and returns from its

knowledge assets. Such a process requires imagination and independent thought. Imagination allows individuals to see what is tentative and possible as well as what is probable and obvious. New insights often reside in the gap between these two poles (Klein 1998). Furthermore, Leonard-Barton considered KM is *"essential for enterprises to determine where they are going and for organizational survival in the long run, given that knowledge creation is the core competency of any organizations"* Leonard-Barton (1995: p. 38). Quinn *et al.* (1996) emphasize the importance of the establishment of an efficient KM process to meet the demands of improved organization performance. Consequently, it is the management of organizational knowledge for creating value and generating a competitive advantage. It consists of the processes required to effectively manage knowledge. It is a key requirement to future successful enterprises and is rapidly being recognized by organizations to be of major strategic importance (Dyer, 2000).

Consequently, KM is a process of leveraging knowledge as means of achieving innovation in process and products/services, effective decision-making, and organizational adaptation to the market for creating business value and generating a competitive advantage to organizations. This will vary from organization to organization but it will always intensify the existing arrangements as well as creative.

4. Knowledge Management in Education

Koch (2003) considered KM in education as management activities that frame and guide knowledge creation in educational organizations. The knowledge creation process is of retrieval, combination, creation and erasing of knowledge. Knowledge creation discards of old knowledge, yet whatever is discarded, it will always be partial of the new created knowledge. KM in education has two main dimensions. First, knowledge creation practices are carried out within a frame of management, information systems, organizational and human resource policies and practices. The knowledge creation resides in several organizational cultures and takes the form of political processes of negotiating knowledge claims. Second, knowledge creation relies not only on information systems, but several systems supporting finance and accounting, document handling, educational practices,

internet communication (Intranet) and Web based projects which all need to be integrated together to support the knowledge creation process.

Although educators might assert that they have been managing knowledge, this has traditionally been on a personal level rather than an organizational basis. The knowledge has normally been managed in an incomplete manner allowing knowledge loss (e.g. key members of the design team leave and people remaining in the organization do not know why a certain aspect of the practice has been designed in a particular way). "*Organizations embrace vast amounts of knowledge in various areas, such as knowledge that is critical to achieve certain goals*" (Rus and Lindvall, 2002: p. 29). Some of these knowledge areas are:

- a) **Acquiring knowledge:** The development of new technologies makes product development more efficient only if educators (users) are proficient with the new technology and they understand its impact. When educators use a technology that they are unfamiliar with, they often resort to the learning by doing approach, which can result in serious delays. So, organizations must quickly acquire knowledge about new technologies and master them.
- b) **Sharing knowledge** Every organization has its own policies, practices, and culture, which are not only technical but also managerial and administrative. This knowledge is usually transferred to new educators informally from experienced educators. Passing knowledge informally is an important aspect of a knowledge sharing culture that should be encouraged. Nonetheless, formal knowledge capturing and sharing ensures that all educators access it. So, organizations must formalize knowledge sharing while continuing informal knowledge sharing.
- c) **Capturing knowledge** Educational organizations depend heavily on knowledgeable educators. Knowing what educators know is necessary for organizations to create a strategy for preventing valuable knowledge from disappearing. Knowing *who knows what* is also a requirement for efficiently staffing projects, identifying training needs, and matching educators with training offers.
- d) **Collaborating and sharing knowledge** Group members are often geographically scattered and work in different time zones. Nonetheless, they

communicate, collaborate and coordinate. Communication in educational organization is often related to knowledge transfer. Collaboration is related to mutual sharing of knowledge. Group members can coordinate independently of time and space if they can easily access their work artifacts.

Shankar et al. (2003) categorized organizational knowledge engrossed across the various value propositions, measurable objectives to achieve business goals, for an educational organization into:

- knowledge related to learning environment development leading to learning and teaching;
- knowledge related to process integration leading to practical excellence;
- knowledge sharing with members leading to strategic alliances with those members;
- learners demand and transactional knowledge leading to learners intimacy;
- tacit knowledge of educators leading to employee capability; and
- knowledge related to the development of environmentally friendly products leading to environmental concern.

Can we translate the theory of knowledge management that developed as an explanation of how knowledge is created as a well-developed model for enhancing professional performance. Disterer, (2002), Lytras and Pouloudi (2003), Szymczak and Walker (2003), emphasized the importance of managing knowledge in educational organizations as these organizations are learning oriented. The focus is to reuse experience gained from one teaching practice in future teaching practice and to link between KM and educational organizational management.

Rus and Lindvall (2002) suggested that organizations can view KM as a risk prevention strategy, because KM explicitly addresses risks that are too often ignored, such as:

- Loss of knowledge due to attrition;

- Lack of knowledge and an evenly longtime to acquire it due to steep learning curves;
- People repeating mistakes and performing rework because they forget what they learned from previous projects;
- individuals who own key knowledge becoming unavailable.

Rus and Lindvall also suggested that *"KM can help educational organizations in saving efforts and time and increasing quality. This is achieved by avoiding mistakes and reducing rework. Repeating successful processes increases productivity and the likelihood of further success"* (Rus and Lindvall, 2002: p. 29). So, organizations need to apply process knowledge gained in previous learning and teaching practices to future ones. Unfortunately, the reality is that the development teams do not benefit from existing experience and they repeat mistakes even though some individuals in the organization have the necessary know-how to avoid them. Educators acquire valuable individual experience with each learning and teaching practices. The organization and individuals could gain much more if they could share knowledge. (why? The knowledge is shared.)

Furthermore, Rus and Lindvall argued that KM can also help organizations in making better decisions. *In educational organizations, technical and managerial decisions are taken constantly. Most of the time, individuals make decisions based on personal knowledge and experience or knowledge gained using informal contacts.* (Rus and Lindvall, 2002: p. 33) This could be feasible in small organizations but as organizations grow and handle a larger volume of information, this process becomes inefficient. Large organizations cannot rely on informal sharing of educators' personal knowledge. Individual knowledge must be shared and managed at organization levels. Organizations need to define formal methodology for sharing knowledge so that educators throughout the organization can improve their decision making process.

Lucier and Torsilieri (2001), believe that educational organizations lead the way in KM initiatives and efforts realizing the potential of KM to improve organization performance and support organization's strategies. Scarbrough and

Swan (1999), argue that a number of organizations have tried and failed to implement KM. Rubenstein et al., (2001) think that the majority of such failures go unreported in the literature as organizations are much more likely to report their successes. These failures have been linked to the lack of a generally accepted framework and methodology to guide successful implementation of KM in organizations (Maier and Remus, 2003).

In conclusion, the presented arguments would specify the factors of the failure of the implementation of KM as follows. Factors refer to fundamental problems within the organization. These factors are the lack of performance indicators and measurable benefits, inadequate management support, improper planning, design, coordination, and evaluation, inadequate skill of knowledge managers and workers, problems with organizational culture, improper organizational structure. Consequently, they lead to lack of widespread contribution, lack of relevance, quality, and usability, overemphasis on formal learning, systematization, and determinant needs, improper implementation of technology, improper budgeting and excessive costs, lack of responsibility and ownership, loss of knowledge from staff defection and retirement.

5. Approaches of Knowledge Management

5.1. Knowledge Management Models

The KM activities must have a conceptual framework to operate, otherwise the activities will not be coordinated and will not produce the expected KM benefits. Few managers and information professionals understand how to manage knowledge in knowledge-creating organizations. One of the reasons that KM has now established itself more credibly as both an academic discipline of study and a professional field of practice is the work that has been done on theoretical or conceptual models of knowledge management. A more holistic approach to KM has become necessary as the complex, subjective, and dynamic nature of knowledge has developed. Cultural and contextual influences further increased the complexity involved in KM. This holistic approach is one that encompasses all the different types of content to be managed, from data, to information, to knowledge, but also conversions from tacit to explicit and back to tacit knowledge types. The KM models presented are an attempt

to address knowledge management in a holistic and comprehensive manner. (Dalkir, 2011).

Davenport and Prusak distinguish among data, information, and knowledge as operational, and they argue that *"people can transform information into knowledge by means of comparison, consequences, connections, and conversation. They stress that knowledge-creating activities take place between people and within each human being"* (Davenport and Prusak, 1998: p. 112) .

Nonaka and Takeuchi, on the other hand, provide a more philosophical distinction. They define knowledge as *"a dynamic human process of justifying personal belief toward the truth"* (Nonaka and Takeuchi (1995: p. 58)." The contend that it is necessary to create knowledge in order to produce innovation. They also believe that the organizational knowledge creation is *"The capability of an organization as a whole to create new knowledge, disseminate it throughout the organization and embody it in products, services, and systems"* (Nonaka and Takeuchi (1995: p. 58).

The researcher presents the major theoretical KM as they are considered holistic approaches to knowledge management. These KM models are comprehensive and include people, process, organization and technology dimensions. Dalkir (2011) argues that these models have been reviewed, critiqued, and discussed extensively in the KM literature by practitioners, academics, and researchers. He also contends that these models have been implemented and field tested with respect to reliability and validity.

5.1.1. Von Krogh and Roos Model

In 1995, Von Krogh and Roos has presented a KM model to distinguish between individual knowledge and social knowledge. They take an epistemological approach to managing organizational knowledge. Varela (1992) proposes that the cognitive perspective is a cognitive system that creates representations of reality and learning occurs when these representations are manipulated. Hence, a cognitive organizational epistemology views organizational knowledge as a self-organizing system in which humans are transparent to the information from the outside, that is, people take in information through their senses and use such information to build their

mental models. The brain is an instrument based on logic and deduction and it does not allow any contradictory propositions. The organization thus picks up information from its environment and processes it in a logical way.

The connectionist approach, on the other hand, is more holistic than reductionist in nature. *"The brain perceives symbols in a wholeness manner, global properties, patterns, synergies, and gestalts. Learning rules govern how the various components of these whole networks are connected. Information is not only taken in from the environment but also generated internally"* (Dalkir 2011: p. 54). Hence, familiarity and practice lead to learning. Individuals form nodes in a loosely connected organizational system and knowledge is an emergent phenomenon that stems from the social interactions of these individuals. Based on the aforementioned argument, knowledge resides not only in the minds of individuals, but also in the connections among these individuals. A collective mind is formed as the representation of this network; and it is this mind that lies at the core of organizational knowledge management.

Von Krach and Roos adopt the connectionist approach. In their organizational epistemology KM model, knowledge resides in both the individuals of an organization and at the social level in the relations between the individuals. *"Knowledge is characterized as "embodied" that is, "everything known is known by somebody"* (Von Krach and Roos, 1995: p. 93). Connectionists maintain that there cannot be knowledge without a knower. Similarly, tacit knowledge is difficult to abstract out of someone and make more concrete. It also reinforces the strong need to maintain links between knowledge objects and those who are knowledgeable about them.

In 1998, von Krogh, Roos, and Kleine examine the fragile nature of KM in organizations. They describe this fragility in terms of the mindset of the individuals, communication in the organization, the organizational structure, the relationship between the members, and the management of human resources. These five factors could impede the successful management of organizational knowledge for innovation, competitive advantage, and other organizational goals. For example, if individuals do not perceive knowledge to be a crucial competence of the firm, then the organization will have trouble developing knowledge-based competencies. If there is no legitimate

language to express new knowledge in the individual, then contributions will fail. If the organizational structure does not facilitate innovation, then KM will fail. If individual members are not eager to share their experiences with their colleagues on the basis of mutual trust and respect, then there will be no generation of social, collective knowledge within that organization. Finally, if those contributing knowledge are not evaluated highly and acknowledged by top management, they will lose their motivation to innovate and develop new knowledge for the organization.

One can conclude that the connectionist approach provides a solid theoretical cornerstone for a knowledge model. It appears to be more appropriate to underpin a theoretical model of knowledge management, due to the fact that the linkage between knowledge and its users is viewed as an unbreakable bond.

5.1.2. Nonaka and Takeuchi Model

Nonaka and Takeuchi (1995) studied how Japanese companies were successful in achieving creativity and innovation. They found out that organizational innovation often stemmed from highly subjective insights that can best be described in the form of metaphors, slogans, or symbols. The Nonaka and Takeuchi KM model has its roots in a holistic model of knowledge. *"The key factor behind the successful track record in innovation of Japanese enterprises stems from the more tacit-driven approach to knowledge management"* (Nonaka and Takeuchi, 1995: p. 85). It follows that the Japanese managers could be engaged in the process of *indwelling*, a term used by Polanyi (1966) to define the involvement of the individuals with objects through self-involvement and commitment, in order to create knowledge. In such a cultural environment, knowledge is principally "group knowledge," easily converted and mobilized and easily transferred and shared. They emphasize the necessity of integrating the cultural, epistemological and organizational points of view to acquire new cultural and operational tools to build better knowledge-creating organizations.

Knowledge creation always begins with the individual. An individual's personal private knowledge is translated into valuable, public organizational knowledge. Making personal knowledge available to others in the organization is at the core of this KM model. This type of knowledge creation process takes place

continuously and it occurs at all levels of the organization. In many cases, the creation of knowledge occurs in an unexpected or unplanned way.

Organizational knowledge creation should be understood as a process that organizationally amplifies the knowledge created by individuals and crystallizes it as a part of the knowledge network of the organization. Knowledge creation consists of a social process between individuals in which knowledge transformation is not simply a unidirectional process but it is interactive and spiral. There are four modes of knowledge conversion, as follows:

- a) From tacit knowledge to tacit knowledge: process of socialization.
- b) From tacit knowledge to explicit knowledge: process of externalization.
- c) From explicit knowledge to explicit knowledge: process of combination.
- d) From explicit knowledge to tacit knowledge: process of internalization.

Dalkir (2011) describes socialization (tacit-to-tacit) as a process that consists of the sharing of knowledge in face-to-face, natural, and typically social interactions. He adds that participants arrive at a shared understanding via the sharing of mental models, brainstorming to come up with new ideas, mentoring interactions ...etc. Socialization is a daily activity for exchanging knowledge. It is an instinctive process that takes place when individuals gather at the café or engage in impromptu corridor meetings. Dalkir (2011) argues that the greatest advantage of socialization is its greatest drawback because knowledge remains tacit and it is rarely captured, noted, or written down. It remains in the minds of the original participants. Socialization is a very effective means of knowledge creation and sharing but it is a time-consuming exercise to disseminate all knowledge gained. Davenport and Prusak (1998), on the other hand, point out that tacit, complex knowledge, developed and internalized by the knower over a long period of time, is almost impossible to reproduce in a document or a database. Hence, the process of acquiring tacit knowledge is not tied to the use of language but to experience and to the ability to transmit and to share it. It should not be confused with the idea of a simple transfer of information because there is no knowledge creation. Socialization consists of sharing experiences through observation, imitation, and practice.

One can clarify the process of socialization in practicing "*brainstorming*" in which there are detailed discussions to solve existing problems. Sometimes, these

informal meetings are usually held outside the workplace, where everyone is encouraged to contribute to the discussion with no reference to the status and qualification of the participants. Such meetings are not allowing simple criticism followed by constructive suggestions, they are only open discussions to develop new ideas and also to improve its managerial systems. They form creative dialogues and shared experience exercises followed by sharing tacit knowledge. Participants create harmony among themselves, they feel engaged as part of a whole, and they feel themselves allied by the same goal.

Nonaka and Takeuchi (1995) contend that externalization (tacit-to-explicit) is a process that gives a visible form to tacit knowledge and converts it to explicit knowledge. They define it as *"a quintessential knowledge creation process in that tacit knowledge becomes explicit, taking the shapes of metaphors, analogies, concepts, hypotheses, or models"* (Nonaka and Takeuchi 1995: p. 147). In this context, individuals are able to articulate the knowledge- *"know-how"*, and *"know-why"*. Since, it is difficult to transform tacit knowledge into explicit one, a knowledge worker can interview knowledgeable individuals in order to extract, model, and synthesize his knowledge about a particular topic in a different way in order to increase its scope. Consequently, knowledge becomes tangible and can be shared more easily with others and leveraged throughout the organization. Thus, organizations can make future decisions about archiving, updating and retiring externalized knowledge content. This involves codifying metadata or information about the content along with the actual content.

Nonaka and Takeuchi model next stage of knowledge conversion in the of combination (explicit-to-explicit), the process of recombining discrete pieces of explicit knowledge into a new form. Some examples would be a synthesis in the form of a review report, a trend analysis, a brief executive summary, or a new database to organize content. No new knowledge is created, it is a new combination of existing explicit knowledge. *Combination takes place when concepts are sorted and systematized in a knowledge system. For instance, when we teach, we really combine existing explicit knowledge in developing a university course, that is, knowledge would be recombined into a form that better lends itself to teaching and to transferring this content* (Dalkir, 2011: p. 87).

Finally, the last conversion process, internalization (explicit-to-tacit) takes place through the diffusion and embedding of newly acquired behavior and newly understood or revised mental models. Internalization is very strongly linked to "*learning by doing*." Internalization converts or integrates shared and/or individual experiences and knowledge into individual mental models. Once new knowledge has been internalized, it is then used by individuals who broaden it, extend it, and reframe it within their own existing tacit knowledge bases. For instance, an organization can develop a system for inquiries to be accessed by all its employees. This system allows the employees to find answers to new questions much more quickly because it facilitates the sharing of employees' experiences in problem solving. This system helps the workers to internalize others' experiences in answering questions and solving problems.

Nonaka and Takeuchi (1995) argue that knowledge (experiences, best practices and lessons learned) goes through the conversion processes of socialization, externalization and combination. In this situation, knowledge is continuously acquired. The reason is that knowledge is internalized into individuals' tacit knowledge bases in the form of shared mental models or technical know-how. Hence, knowledge becomes a valuable asset to the individual, to their community of practice, and to the organization. In order for organizational knowledge creation to take place the entire conversion process has to begin all over again: the tacit knowledge accumulated at the individual level needs to be brought into contact with other organizational members, thereby starting a new spiral of knowledge creation. When experiences and information are transferred through observation, imitation, and practice, then we are back in the socialization quadrant. This knowledge is then formalized and converted into explicit knowledge, through the use of analogy, metaphor, and model, in the externalization quadrant. This explicit knowledge is then systemized and recombined in the combination quadrant-whereupon it once again becomes part of individuals' experience. In the internalization quadrant, knowledge has once again thus become tacit knowledge.

Dalkir (2011) knowledge creation is not a sequential process, but depends on a continuous and dynamic interaction between tacit and explicit knowledge throughout the four quadrants. Organizations articulate, organize, and systematize individual tacit

knowledge, produce and develop tools, structures, and models to accumulate it and share it to create new knowledge through the knowledge spiral as illustrates in figure

The knowledge spiral is a continuous activity of knowledge flow, sharing and conversion by individuals, communities, and the organization itself. Nonaka and Takeuchi argue that the two steps that are *"the most difficult are those involving a change in the type of knowledge (i) externalization, which converts tacit in to explicit knowledge, and (ii) internalization, which converts explicit knowledge into tacit"*. (Nonaka and Takeuchi, 1995: p. 93) These two steps require a high degree of personal commitment and they will typically involve mental models, personal beliefs, and values, and a process of reinventing oneself, one's group, and the organization as a whole. They emphasize that a metaphor is a good way of expressing this "inexpressible" content. Usually, metaphors are often used to convey two ideas in a single phrase and may be defined as a phrase that "accomplishes in a word or phrase what could otherwise be expressed only in many words, if at all". For example, a slogan, a story told and an analogy can encapsulate complex contextual meanings. The higher the successful implementation of a knowledge spiral, the better and the more coherent the model.

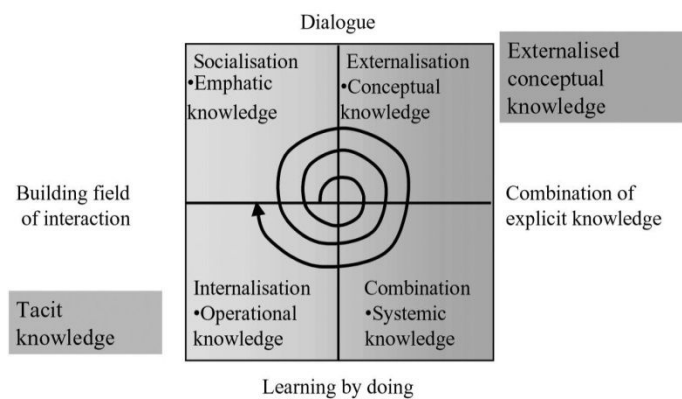


Figure (1): Nonaka and Takeuchi model. Source (Dalkir, 2011)

Dalkir (2011) contends that it is possible to structure metaphors in an organizational KM design. Knowledge works need to build a redundancy to make sure that there is overlapping information. Consequently, redundancy will make it easier to articulate content, to share content, and to make use of it.

Nonaka and Takeuchi (1995) believe that knowledge sharing occurs through the *knowledge spiral* that, "starting at the individual level and moving up through expanding communities of interaction. Moreover, Nonaka and Takeuchi argue that an organization has to promote a facilitating context in which both the organizational and the individual knowledge-creation processes can easily take place, acting as a spiral. They describe the following "*enabling conditions for organizational knowledge creation*" (Nonaka and Takeuchi, 1995: p. 95):

- *Intention* An organization's aspiration to its goals (strategy formulation in a business setting)
- *Autonomy* To allow individuals to act autonomously, according to the "minimum critical specification" principle, and involved in cross-functional self-organized teams
Fluctuation and creative chaos To stimulate the interaction between the organization and the external environment and/or create fluctuations and breakdowns by means of creative chaos or strategic "equivocality"
- *Redundancy* Existence of information that goes beyond the immediate operational requirements of organizational members; competing multiple teams on the same issue; strategic rotation of personnel.
- *Requisite variety* Internal diversity to match the variety and complexity of the environment; to provide to everyone in the organization the fastest access to the broadest variety of necessary information; fiat and flexible organizational structure interlinked with effective information networks

In conclusion, one can argue that the Nonaka and Takeuchi model has proven to be one of the more robust in the field of KM and it continues to be applied in a variety of settings. The simplicity of the model-both in terms of understanding the basic tenets of the model and in terms of being able to quickly internalize and apply the KM model make simple to be used. But on the other hand, the major shortcomings of the model is that while it is valid, it does not appear to be sufficient to explain all of the stages involved in managing knowledge. It focuses on the knowledge transformations between tacit and explicit knowledge, but the model does not address larger issues of how decision making takes place by leveraging both these forms of knowledge.

5.1.3. Choo Model

Chao (1998) has applied different strategies to build a new model of knowledge management that stresses sense making. He has based his model on Weick (2001) Nonaka and Takeuchi (1995) for knowledge creation and has based it on Simon (1957), among others, for decision making. The model focuses on how information elements are selected and subsequently fed into organizational actions. Organizational action results from the concentration and absorption of information from the external environment into each successive cycle. Each of the phases, sense making, knowledge creation, and decision making, has an outside stimulus or trigger.

The sense-making stage is the one that attempts to make sense of the information streaming in from the external environment. Priorities are identified and used to filter the information. Common interpretations are constructed by individuals from the exchange and negotiation of information fragments combined with their previous experiences. Weick proposed a theory of sense making to describe how chaos is transformed into sensible and orderly processes in an organization through the shared interpretation of individuals. *A loosely coupled system is a term used to describe systems that can be taken apart or revised without damaging the entire system.* (Weick, 2001: p. 78) For example, a human being is tightly coupled, but the human genome is loosely coupled. Loose coupling permits adaptation, evolution, and extension. Sense making can be thought of as a loosely coupled system where individuals construct their own representation of reality by comparing current with past events.

Weick (2001) claims that sense making in organizations consists of four integrated processes :

- *Ecological change* is the phase where a change in the environment that is external to the organization-one that disturbs the flow of information to participants;
- *Enactment* is the phase where people try to construct specific elements of content and objective features are more orderly through the creation of own rules to clarify the content for selection process;
- *Selection* is the phase where individuals attempt to interpret the rationale for the observed and enacted changes by making selections.

- *Retention* is the process which furnishes the organization with an organizational memory of successful sense-making experiences. This memory can be reused in the future to interpret new changes and to stabilize individual interpretations into a coherent organizational view of events and actions to reduce any uncertainty and ambiguity associated with unclear or poorly defined information .

Consequently, knowledge creating is seen as the transformation of personal knowledge between individuals through dialog, discourse, sharing, and storytelling and it is directed by a knowledge vision. Knowledge creation widens the spectrum of potential choices in decision making through the provision of new knowledge and new competencies. The result feeds the decision-making process with innovative strategies that extend the organization's capability to make informed, rational decisions. Choo (1998) draws upon the Nonaka and Takeuchi (1995) model for a theoretical basis of knowledge creation.

Decision making is situated in rational decision-making models that are used to identify and evaluate alternatives by processing the information and knowledge collected to date. Simon (1957) suggested that people faced with ambiguous goals and unclear means of linking actions to those goals seek to fulfill short-term subgoals. These subgoals are objectives that the individual believes can be achieved by allocating resources under his control. They are generally not derived from broad policy goals, but rather from experiences, education, the community, and personal needs. Bounded rationality theory was first proposed by Simon (1976) as a limited or constrained rationality to explain human decision-making behavior. When confronted with a highly complex world, the mind constructs a simple mental model of reality and tries to work within that model. The model may have weaknesses, but the individual will try to behave rationally within the constraints or boundaries of that model. Individuals can be bound in a decisional process by a number of factors, such as:

- Limits in knowledge, skills, habits, and responsiveness;
- Availability of personal information and knowledge;
- Values and norms held by the individual that may differ from those of

the organization.

Organizational and management sciences accept this theory. Bounded rationality theory is characterized by individuals' use of limited information analysis, evaluation, and processing.

In conclusion, one can argue that one of the strengths of the Choo KM model is the *holistic treatment* of key KM cycle processes extending to organizational decision making, which is often lacking in other theoretical KM approaches. This makes the Choo model one of the more realistic or feasible models of KM as the model represent organizational actions with high fidelity. The Choo KM models particularly well suited to simulations and hypothesis or scenario-testing applications.

5.1.4. Wiig Model

Wiig approached KM with the emphasis on the principle of the knowledge to be useful and valuable. "*Knowledge should be organized differently depending on what the knowledge will be used for. Usually, individuals tend to store our knowledge and know-how in the form of semantic networks*".(Wiig, 1993: p. 64)

Knowledge is organized in a semantic network way can be accessed and retrieved using multiple entry paths that map onto different knowledge tasks to be completed. Some useful dimensions to consider in Wiig's KM model include:

1. *Completeness* addresses the question of how much relevant knowledge is available (i.e., tacit or explicit knowledge). There should be a full recognition of the availability of knowledge and also the ability of using it
2. *Connectedness* refers to the close linkages between the different elements of knowledge. Sometimes, knowledge elements are disconnected, yet the greater the number of interconnections in the semantic network the more coherent the content and the greater its value.
3. *Congruency* refers to the consistency of knowledge elements: facts, concepts, perspectives, values, judgments, and associative and relational links between the knowledge objects are consistent. Most knowledge content will not meet such ideals where congruency is concerned. However, concept definitions should be consistent and the knowledge base as a whole needs to be constantly fine-tuned to maintain congruency.

4. *Perspective and purpose* refer to the phenomenon of a known situation from a particular point of view or for a specific purpose. Individuals organize much of their knowledge using the dual dimensions of perspective and purpose.

Semantic networks are useful ways of representing different perspectives on the same knowledge content. Wiig's approach can be seen as a further refinement of the fourth Nonaka and Takeuchi quadrant of internalization. In general, there is a continuum of internalization, starting with the lowest level, the novice, who "does not know he does not know," that is, who does not even have an awareness that the knowledge exists, to the mastery level, where there is a deep understanding not just of the know-what, but the know-how, the know-why, and the care-why (i.e., values, judgments, and motivations for using the knowledge).

Wiig (1993) also defines three forms of knowledge: public knowledge, shared expertise, and personal knowledge. *Public knowledge* is explicit, taught, and routinely shared knowledge that is generally available in the public domain. An example would be a published book or information on a public web site. *Shared knowledge/expertise is proprietary knowledge assets that are exclusively held by knowledge workers and shared in their work or embedded in technology*" (Wiig, 1993: p. 66) This form of knowledge is usually communicated via specialized languages and representations. Shared knowledge would be common in communities of practice, informal networks of likeminded profession who interact and share knowledge to improve the practice of their profession. Thirdly, personal knowledge is the least accessible but most complete form of knowledge. Personal knowledge is typically more tacit than explicit knowledge, and is used unconsciously in work and daily life.

In addition to the three previous major forms of knowledge, Wiig (1993) defines four types of knowledge (*factual, conceptual, expectational, and methodological*). *Factual knowledge* deals with data, measurements, readings directly observable and verifiable content. *Conceptual knowledge* deals with systems, concepts, and perspectives. *Expectational knowledge* concerns judgments, hypotheses, and expectations held by knowers (e.g. preferences, and heuristics that we make use of in our decision making). Finally, *methodological knowledge* deals with reasoning,

strategies, decision-making methods, and other techniques (e.g. learning from past mistakes or forecasting based on analyses of trends).

To summarize, Wiig (1993) proposes a hierarchy of knowledge that consists of public, shared, and personal knowledge forms. The major strength of the Wiig model is the organized approach to categorizing the type of knowledge to be managed remains a very powerful theoretical model of KM. It is believed to be the most pragmatic of the models in existence today and can easily be integrated into any of the other approaches. Wiig KM model enables practitioners to adopt a more detailed or refined approach to managing knowledge based on the type of knowledge, but going beyond the simple tacit/explicit dichotomy. The major shortcoming is that very little has been published in terms of research and/or practical experience in implementing this model.

5.1.5. Boisot I-Space Model

The Boisot KM model is based upon the key concept of an "information good" that differs from a physical asset. Boisot distinguishes information from data by emphasizing that *"information is what an observer will extract from data as a function of his or her expectations or prior knowledge. The effective movement of information goods is very much dependent on senders and receivers sharing the same coding scheme or language"* (Boisot, 1998: p. 49). A "knowledge good" is a concept that in addition possesses a context within which it can be interpreted. Effective knowledge sharing requires that senders and receivers share the context as well as the coding scheme.

Boisot (1998) proposes the following two key points:

- The more easily data can be structured and converted into information, the more diffusible it becomes.
- The less data that has been so structured requires a shared context for its diffusion, the more diffusible it becomes.

Together, they underpin a simple conceptual framework, the information space or I-Space KM model. The data are structured and understood through the processes of codification and abstraction. Codification refers to the creation of content categories- the fewer the number of categories, the more abstract the codification

scheme. The assumption is that well-codified abstract content is much easier to understand and apply than highly contextual content. Boisot's KM model does address the tacit form of knowledge by noting that in many situations, *"the loss of context due to codification may result in the loss of valuable content. This content needs a shared context for its interpretation and that implies face-to-face interaction and spatial proximity- which is analogous to the socialization quadrant "* (Nonaka and Takeuchi 1995, p: 53).

The I-Space model can be visualized as a three-dimensional cube with the following dimensions:

1. Codified-uncodified
2. Abstract-concrete
3. Diffused-undiffused

The activities of coding, abstracting, diffusing, absorbing, impacting, and scanning all contribute to learning. Where they take place in sequence-and to some extent they must-together they make up the six phases of a social learning cycle (SLC).

The strength of the Boisot model is that it incorporates a theoretical foundation of social learning. The Boisot model serves to link together content management, information management, and knowledge management in a very effective way. In a very approximate sense, the codification dimension is linked to categorization and classification; the abstraction dimension is linked to knowledge creation through analysis and understanding; and the third diffusion dimension is linked to information access and transfer. There is a strong potential to make use of the Boisot I-Space KM model to map and manage an organization's knowledge assets as an SLC-something that is not directly addressed by the other KM models. However, the Boisot model appears to be somewhat less well known, less accessible, and as a result has not had widespread implementation. More extensive field-testing of this KM model would provide feed- back regarding its applicability as well as provide more guidelines on how best to implement the I-Space approach.

Consequently, the previous arguments presented the researcher with this conclusion, knowledge creation is initiated with the individual efforts then translated

into valuable public organizational knowledge to make personal knowledge available to others in the organization as a response to the core aim of KM. This type of knowledge creation process happens continuously at all levels of the organization and in an unexpected or unplanned way. For example, Nonaka and Takeuchi model has proven to be one of the more robust in the field of KM and it continues to be applied in a variety of settings. The simplicity of the model-both in terms of understanding the basic tenets of the model and in terms of being able to quickly internalize and apply the KM model make simple to be used. But it does not explain all of the stages involved in managing knowledge. It concentrated on the knowledge transformations strategies between tacit and explicit knowledge, but it does not address issues of how decision making takes place.

On the other hand, Choo KM model is the holistic treatment of key KM cycle processes extending to organizational decision making, which is often lacking in other theoretical KM approaches which makes the model more feasible and well suited to simulations the applications. Meanwhile, Wiig proposes a hierarchy of knowledge that consists of public, shared, and personal knowledge forms. The major strength is the organized approach to categorizing the type of knowledge to be managed. It is believed to be the suitable for educational organizations today and can easily be integrated into other approaches. It enables practitioners to adopt a more detailed approach to managing knowledge based on the type of knowledge. The researcher recommend R& D in education should invest in this model since there is little efforts have been done.

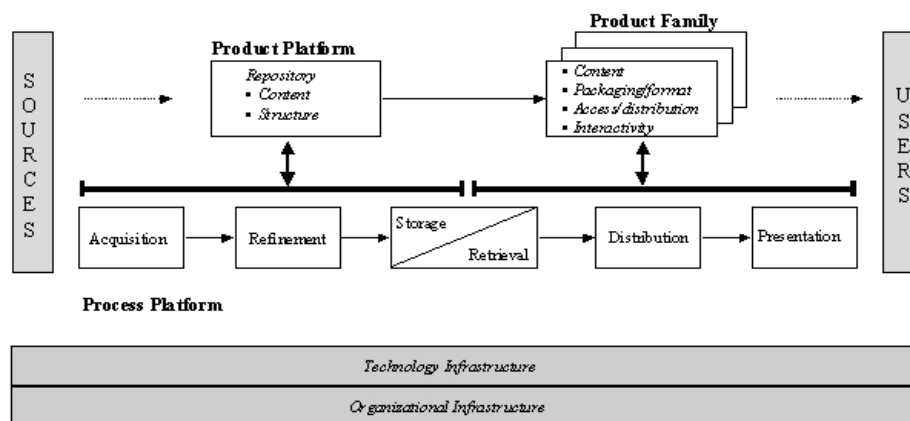
5.2. Knowledge Management Cycles

The knowledge management cycles provide a good basis for considering the effectiveness of various information and knowledge development and sharing processes. Km cycles pinpoint areas of strength and weaknesses, and hence what skills or systems need improvement , create dialogue over how different people and different parts of the organization manage their information and knowledge, identify particular bottlenecks in information and knowledge processing, and they can highlight opportunities to capture and disseminate best practice in information and knowledge management.

5.2.1. Meyer and Zack KM Cycle

Meyer and Zack (1996) proposed KM cycle derived from work on the design and development of information products. They believed that research and knowledge about the design of physical products could be extended into the intellectual realm to serve as the basis for a KM cycle. This approach provides a number of useful analogies such as the notion of a product platform (the knowledge repository) and the notion of information process platform (the knowledge refinery) to emphasize the notion of value-added processes required in order to leverage the knowledge of an organization. They echoed other authors in stressing "*the importance of managing the evolution and renewal of product architecture for sustained competitive success to meet the needs of distinct individuals through profiling and personalization value-added activities.*" (Meyer and Zack, 1996: p. 54)

The Architecture of Information Products



Source : Meyer and Zack, 1996

Figure 2

©Michael H. Zack, 1998

This KM cycle is aiming at creating a higher value-added to knowledge product at each stage of knowledge processing. For instance, values can be added by extracting trends from the available data. So, the original information has been repacked to provide trend analyses that can serve as the basis for new implementation within the organization. It composed of technologies, facilities, and processes. The information products are best viewed as a repository comprising information content and structure. Information content is the data held in the

repository that provides the building blocks for the resulting information products. In addition to the actual content, the overall structure and approach as to how the content is stored, manipulated, and retrieved are important elements to consider. The information unit is singled out as the formally defined atom of information to be stored, retrieved, and manipulated. This notion of a unit of information is a critical concept that should be applied to knowledge items as well. A focus at the level of a knowledge object distinguishes KM from document management.

A document management system (DMS) is storing, manipulating and retrieving documents as integral body, while KM deals with identifying, extracting and managing a number of different knowledge items -referred to as- "knowledge objects" within the same document. This is to assure the argument that KM is not about the exhaustive collection of voluminous content but rather more selective sitting and modification of existing captured content (Dalkir, 2011).

On the other hand, a well-designed repository will include schemes for labeling, indexing, linking and cross-referencing the information units that together comprise its content. In this model, the information product is addressed more broadly, whereas knowledge possesses unique attributes not found in information. This is true when managing explicit knowledge but with tacit knowledge, new management approaches need to be used to build on solid content management processes. The greater the scope, depth and complexity, the greater the flexibility for deriving products and thus the greater the potential variety within the product family. Such repositories often form the first kernel of an organizational memory (Meyer and Zack, 1996).

The major developmental stages of a knowledge repository as identified by Meyer and Zack were *acquisition, refinement, storage/retrieval, distribution, and presentation/use*.

- a) Acquisition of data or information addresses the issues such as scope, breadth, depth, credibility, accuracy, timeliness, relevance, cost, control, exclusivity, and so on. The data must be of the highest quality, otherwise the intellectual products produced downstream will be inferior.

- b) Refinement is the primary source of added value. This refinement may be physical or logical. This stage of the Meyer and Zack cycle adds value by creating more readily usable knowledge by storing the content more flexibly for future use.
- c) Storage/retrieval forms a bridge between the upstream acquisition and refinement stages that feed the repository and downstream stages of product generation . Storage may be physical or digital.
- d) Distribution describes how the product is delivered to the end user and encompasses not only the medium of delivery but also its timing, frequency, form, language, and so on.
- e) The final step is presentation or use. It is here that context plays a very important role. The effectiveness of each of the preceding value-added steps is evaluated here, if the user has sufficient context to be able to make use of such content. If not, the KM cycle has failed to deliver value-to the individual and ultimately to the organization.

The Meyer and Zack model is considered to be one of the most complete descriptions of the key elements involved in the knowledge management models. Its strength derives primarily from its comprehensive information -processing paradigm that is completely adaptable to knowledge-based content. In particular, the notion of refinement is a crucial stage in the KM cycle and one that is often neglected.

5.2.2. Bukowitz and Williams Cycle

Bukowitz and Williams (2000) described a knowledge management process framework that outlines how organizations generate, maintain and deploy a strategically correct stock of knowledge to create value. In this framework, *"knowledge consists of knowledge repositories, relationships, information technologies, communications infrastructures , functional skill sets, process know-how, environmental responsiveness, organizational intelligence, and external sources, among others"* (Bukowitz and Williams, 2000: p. 55). The three phases "get," "learn," and "contribute" are tactical in nature . They are triggered by market-driven opportunities or demands and result in day-to-day use of knowledge to respond to these demands. The phases "assess," "build/sustain," and "divest" are

more strategic in nature, triggered by shifts in the macro environment. These focus on more long range processes of matching intellectual capital to strategic requirements.

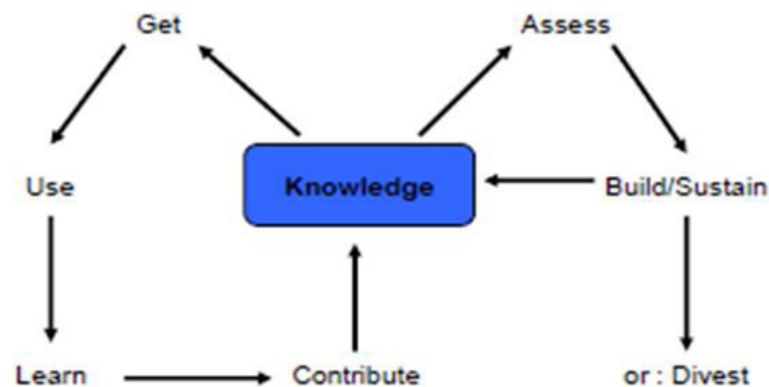


Figure (3) Bukowitz and Williams Cycle, Source Dalkir 2011

- a) The first stage "*get*" consists of seeking out information needed, but the challenge is not in finding information, it is in dealing effectively with the enormous volume of information that can be obtained. Technology has created great steps in providing access to such information which identifies the knowledge of value and to manage that knowledge effectively and efficiently. The information must not only be connected to content, but also to content experts where most of the valuable tacit knowledge resides.
- b) The second stage "*use*" deals with how to combine information in new and interesting ways in order to foster organizational innovation. The focus is primarily on individuals, and then on groups. The narrow focus on innovation is limiting in this KM cycle. Hence, the notion of promoting the most fluid flow of knowledge is a worthwhile pursuit, than the uses of knowledge are much wider in scope than mere innovation.
- c) The third stage "*learn*" refers to the formal process of learning from experiences as a means of creating competitive advantage. An

organizational memory is created so that organizational learning becomes possible—from both successes (best practices) and failures (lessons learned). The links between learning and creating value are harder to establish than those of getting and using information. Learning in organizations is important because it represents the transition step between the application of ideas and the generation of new ones. Consequently, there should be a strong link between organizational strategy and organizational learning activities. Learning is absolutely essential after the getting and using of content—otherwise, the content is simply warehoused somewhere and not making a difference in how things are done within the organization .

- d) The fourth stage "*contribute*" of the KM cycle deals with getting employees to post what they have learned to the communal knowledge base (e.g., a repository). This is to make individual knowledge visible and available across the entire organization—where appropriate and necessary. The goal of this exercise is not to post everything on the organization intranet, but to select those experiences from which others in the organization may benefit. This implies that the experience has potential to be generalized. Consequently, a great deal of content to be shared organization-wide should be provided in a generic format in order to be of use to a wider audience .

For example, the individuals should be encouraged to post what they have learned "*best practices*" to apply the successful results gained from experience OR "*lessons learned*" to avoid less successful outcomes so that the same mistakes are not repeated. *Knowledge sharing does not happen with a direct pay-per-contribution scheme, and also does not happen if there is a punish-the-withholders mentality.* (Bukowitz and Williams, 2000: p. 61). Hence, knowledge sharing takes place as follows: (i) the benefits of sharing for both the organization and the individuals must be clearly perceived; (ii) the recognition of the successful deployment of knowledge brokers—professionals who assume the responsibility of gathering,

repackaging, and promoting knowledge nuggets throughout the organization. (iii) the maintenance of the results of organizational learning (a good organizational memory management system). Part of good organizational memory management practice should be to maintain attribution, require authorization for dissemination, provide feedback mechanisms, and keep track of knowledge reuse. One of the best rewards of contributing is for the user to be notified of how popular his/her contributions were.

- e) The fifth stage "*assess*" deals more with the group and organizational level. Assessment usually refers to the evaluation process of intellectual capital defined by the organization. The definition of the critical knowledge and the mapping of the current intellectual capital against future knowledge is very essential. Also the development of organizational metrics is needed to demonstrate the growth of organizational knowledge to profit from its investments in intellectual capital. Moreover, the impact of knowledge on organizational performance should be visible in identifying competencies, technology infrastructure, values, norms, and culture. Hence, the assessment must take into account these new types of assets and focus on how easily and flexibly the organization can convert its knowledge into products and services of value to the individual.
- f) The sixth stage "*build and sustain*" in the KM cycle makes the future intellectual capital of the organization valid and competitive. The tangible and intangible resources must be allocated to increase the growth and maintenance of knowledge.
- g) The stage "*divest*" in the Bukowitz and Williams KM cycle is the final step. The organization should not hold on to assets (physical/intellectual) if they are no longer creating value. In this step, organizations need to examine the intellectual capital in terms of the resources required to maintain, that is, to the why, when, where, and how of formally divesting parts of the knowledge base. This cost

analysis is necessary to understand the validity of the knowledge and its necessity for sustaining competitive advantage.

Usually, divestiture decisions regarding knowledge include obtaining patents, spinning off organizations, outsourcing work, terminating a training program and/or employees, replacing/upgrading technologies, and ending partnerships, alliances, or contracts. Hence, KM requires a planned and purposeful form of divesting.

In conclusion, the Bukowitz and Williams KM cycle introduces two new critical phases: the learning of knowledge content and the decision as to whether to maintain such knowledge or divest the organization of that knowledge content. This KM cycle is more comprehensive than the Meyer and Zack cycle as the notion of tacit as well as explicit knowledge management has been incorporated.

5.2.3. McElroy Cycle

McElroy (1999) described a knowledge life cycle that consists of the knowledge processes of knowledge production and integration, with a series of feedback loops to organizational memory, beliefs, claims, and the business-processing environment.

McElroy (1999) emphasized that organizational knowledge is held both subjectively in the minds of individuals and groups and objectively in explicit forms. Together, they comprise the distributed organizational knowledge base of the organization. Argyris and Schon (1978) argued that knowledge use in the business-processing environment results in outcomes that either match expectations or not matching. McElroy argues that "*knowledge matches organization's expectations reinforce the existing knowledge, leading to its implementation, whereas mismatches lead to adjustments in business processing behavior via single loop learning. Successive failures from mismatches will lead to doubt and ultimately rejection of existing knowledge, which will in turn trigger knowledge processing to produce and integrate new knowledge, this time via double loop learning*" (McElroy, 1999: p. 167).

The term *problem claim formulation* represents an attempt to learn and state the specific nature of the detected knowledge gap. Meanwhile, the term *knowledge claim* formulation follows as a response to validated problem claims via information

acquisition and individual and group learning. New knowledge claims are tested and evaluated via knowledge claim evaluation processes. Evaluation of knowledge claims lead to surviving knowledge claims which will be integrated as new organizational knowledge or "--falsified/undecided knowledge claims". The record of all such outcomes becomes part of the distributed organizational knowledge base via knowledge integration. Once integrated, they are used in business processing. Experience gained from the use of knowledge in the organizational knowledge base gives rise to new claims and resulting beliefs, triggering the cycle to begin all over again.

In knowledge production, the key processes are: individual and group learning, knowledge claim formulation, information acquisition, codified knowledge claim, and knowledge claim evaluation. That is, individual and group learning represents the first step in organizational learning.

Knowledge is information until it is validated. Knowledge claim validation involves codification at an organizational level. A formalized procedure is required for the receipt and codification of individual and group innovations. Information acquisition is the process by which an organization deliberately acquires knowledge claims or information produced by others, usually external to the organization. This stage plays a fundamental role in the formulation of new knowledge claims at the organizational level. Examples include competitive intelligence, subscription services, library services, research initiatives, think tanks, consortia, and personalized information services. McElroy, moreover, emphasizes that "*knowledge claim evaluation is the process by which knowledge claims are evaluated to determine their veracity and value*" (McElroy, 1999: p. 169). This implies that they are of greater value than existing knowledge in the organizational knowledge base

Knowledge integration is the process by which an organization introduces new knowledge claims to its operating environment and retires old ones. This includes all knowledge transmission such as teaching, knowledge sharing, and other social activities that communicate either an understanding of previously produced organizational knowledge to knowledge workers, or integrate newly minted knowledge.

One of the great strengths of the McElroy cycle is the clear description of how knowledge is evaluated and how a conscious decision is made as to whether or not it will be integrated into the organizational memory. The validation of knowledge is a step that clearly distinguishes knowledge management from document management. The KM cycle does more than address the storage and subsequent management of documents or knowledge that has been warehoused as is. The KM cycle focuses on processes to identify knowledge content that is of value to the organization and its employees.

5.2.4. Wiig Cycle

Wiig (1993) focused on three principles for an organization to conduct its business successfully: (i) it must have a business (products and services) and customers for them, (ii) it must have resources (people, capital, facilities), and (iii) it must have the ability to act. Knowledge is the principal force that determines and drives the ability to act intelligently. With improved knowledge, individuals know better what to do and how to do it. Wiig identifies the major purpose of KM as an effort: *"to make the enterprise intelligent-acting by facilitating the creation, accumulation, deployment and use of quality knowledge"* (Wiig, 1993: p. 83). He argued that working smarter meant that individuals should approach their tasks with greater expertise through the application of high quality acquired knowledge.

Wiig's KM cycle addressed how knowledge is built and used as individuals or as organizations, as follows:

1. Building knowledge
2. Holding knowledge
3. Pooling knowledge
4. Applying knowledge

Wiig (1993) identified activities of knowledge creation as R&D projects, innovations by individuals to improve the way in which they perform their tasks, experimentation, reasoning with existing knowledge, and by hiring new people. He also named other sources of knowledge creation as knowledge importing *"eliciting knowledge from experts, from procedure manuals, by a joint venture to obtain*

technology, or by transferring people between departments". (Wiig, 1993: p. 57). Finally, he mentioned that knowledge might be created through observing the real world (e.g., site visits, observing processes after the introduction of a change).

Moreover, Wiig (1993) specified a number of steps of analyzing knowledge as follows:

- Extracting what appears to be knowledge from obtained material (e.g., analyze transcripts and identify themes, listen to an explanation, and select concepts for further consideration)
- Abstracting extracted materials (e.g., from a model or a theory)
- Identifying patterns extracted (e.g., trend analysis)
- Explaining relations between knowledge fragments (e.g., compare and contrast, causal relations).
- Verifying that extracted materials correspond to meaning of original sources (e.g., meaning has not been corrupted through summarizing, collating, etc.).

Wiig (1993) dealt with two other KM activities, namely knowledge synthesis and codifying. Knowledge synthesis consists of generalizing analyzed material to obtain broader principles, generating hypotheses to explain observations, establishing conformance between new and existing knowledge (e.g., corroborating validity in light of what is already known), and updating the total knowledge pool by incorporating the new knowledge. Codifying knowledge addresses how individuals represent knowledge in their minds (e.g., mental models), how they then assemble the knowledge into a coherent model, how they document the knowledge in books and manuals, and how they encode it in order to post it to a knowledge repository.

Wiig KM cycle is fully recognized for the description of how organizational memory is put into use in order to generate value for individuals, groups, and the organizational itself, and the role of knowledge and skill, constraints that may prevent such knowledge from being fully used, opportunities, and alternatives to managing knowledge and the expected added value to the organization.

5.3. Knowledge Management Systems

Alavi and Leidner characterize Knowledge Management Systems (KMS) as "*a specific technology-based portal which is used for effective knowledge management. It refers to any type of IT portal that stores, retrieves, captures and uses knowledge, improves collaboration, finds sources of knowledge, mines repositories for hidden knowledge, or somehow enhances the KM process*" (Alavi and Leidner, 2001: p. 29). In other words, it may refer to a combination of tools and platforms which is used to manage the organizational knowledge. Lewin and Minton (1998) specifically mention the primary goal of KMS is to bring knowledge from the past to be used in present activities which results in an increased level of the organizational effectiveness.

There are a number of useful functions performed by KMS. For instance, KMS has proved extremely useful in performing many of KM functions, namely content management and data mining, looking for hidden knowledge or relationships within contents. It is also used to update, distribute, tag, and manage content. More likely, it may include a wide range of functions, including web-content management and document management systems. In the meantime, there are other functions such as the import and creation of documents and multimedia material, identification of key users and their roles, the assignment roles and responsibilities to different instances of content categories or types, the definition of workflow of tasks so that knowledge administrators can be informed when changes in information are made, the tracking and management of multiple versions of information, and the publishing of information to a repository to support access. In research-based environments, KMS can also incorporate search and retrieval mechanism. The indexing, searching, and retrieval mechanisms of KMS such as using meta-data or content from the actual document and other mechanisms are used to facilitate KM process.

Maier (2004) put it directly that KMS is a technological part of person-oriented and the organization instruments called knowledge management *initiatives* which target the improvement in productivity of knowledge work. Hansen, Nohria and Rierney (1999) believe that KM initiatives are classified according to the strategy of both human-related personalization and technology-related codification. They are further distinguished according to the scope of initiatives related to enterprises and principles that cross the organizational boundaries.

According to these principles, initiatives can establish a central unit for KM, or they can be run by a set of communities or projects. These initiatives generally focus on a specific type of content along with knowledge management life-cycle, for example, ideas, experience, lesson learned approved knowledge end product, procedure, best practices etc. Maier (2004) assures that the KM initiatives are also characterized by open, trustful or collective the organizational culture where willingness to share knowledge is high. Hence proper initiatives determine the right selection of KMS.

Jennex and Olfmann clearly mention that "*KMS is used to support and enhance knowledge intensive tasks, projects and processes related to knowledge creation, the organization, storage, retrieval, transfer, formatting, reuse and revision*" (Jennex and Olfmann, 2003: p.97). Zack (1999) agrees that KMS provides a pipeline for the smooth flow of explicit knowledge through a refinement process. The focus on this refinement process is a user-centric approach which uses information technology (IT). Jennex and Olfmann (2003) add that this IT powered user-centric approach provides a base system to capture and distribute knowledge. KMS is not an application system which targets a single KM initiative, but a platform which can be used either for supporting knowledge processes or for integrating base systems and repositories on which KM application systems are based. This platform offers functionalities for user administration, messaging, sharing of knowledge and conferencing. Maier (2004) draw out attention to other advanced services such as personalization, clustering and categorization to enhance the relevance of retrieved knowledge, advanced graphical techniques, shared workspaces, distributed services and integration of knowledge from various distributed sources.

Tsui (2003) argues that KMS can be implemented in a large number of areas related to knowledge for creating and sharing good practices, implementing different experience-management systems, organizing knowledge in proper taxonomy and ontology, managing competency, filtering and handling of interests that is used to connect people, developing knowledge networks and facilitating problem solving intelligently.

However, Alvi and Leidner (2001) mention a specific function to KMS as primarily used to share explicit knowledge but can also help in communication used to interpret citation's and generate activities, behavior and solutions. So KMS not only store knowledge but also share it among its users. It can also create, organize and reuse knowledge.

Consequently, to benefit of the aforementioned functions of KMS, participants should chose the system and implement it appropriately.

Bacera-Fernandez and Sabherwal (2010) draw our attention to the proper building of KMS in an organization which is required for running an effective and efficient KM process. The building of KMS requires good the organizational and technological infrastructure which is effective in knowledge management. The primary infrastructure required for building KMS are: *The organizational culture, The organizational Structure, information technology infrastructure, Physical Environment and Some other Common Knowledge.* (Bacera-Fernandez and Sabherwal, 2010 : p. 110)

5.4. Organizational KMS

Organizational KMS is an information system supporting a network of Knowledge Workers in creating, constructing, identifying, collecting, selecting, organizing, structuring, distributing, refining, browsing and applying knowledge, with the purpose of supporting dynamics of organizational learning and organizational effectiveness.

- a) **Organizational culture:** Depicts the norms and beliefs that discuss the behavior of member or the organization. A supporting the organization culture motivates educators to understand the benefits of KM and to find the way of KM. The enabling of the organization culture includes understanding the importance of KM practices, management support for KM, incentives to reward knowledge sharing and motivation of interaction among educators to create and share knowledge.
- b) **Organizational structure:** Organizational structure is an important organizational infrastructure required to build KMS. Several aspects of the

organizational structure have been discussed. First, the hierarchical structure of the organization affects persons with whom individual frequently interacts for knowledge transfer. In traditional hierarchical relationship, the flow of data and knowledge is dependent of the nature of groups who make the decision. By decentralizing the organization structure, organizations should remove the organizational layers and put more responsibilities on individuals and increases the size of groups reporting to individuals. The knowledge sharing happens in a larger group. Second, the organizational structures facilitate KM through communities of practice (CoP). CoP is a self-organized group of geographically dispersed group of individuals who communicate regularly and share knowledge. It becomes easy to communicate in large group by using CoP than traditional hierarchical group. It also provides access to external knowledge sources, for example individuals, suppliers and partners. Third, the organizational structure can also facilitate KM by specialized structures and roles. In this case, the organization specifically appoints individuals in different roles who generally help in handling knowledge by creation and sharing.

- c) **Organization's information technology infrastructure:** Organization's information technology infrastructure helps in knowledge management. The information technology infrastructure includes data processing, storage and communication technological systems. It includes technologies related to data bases, data warehouses, enterprise resource planning etc. The capabilities of IT infrastructure provides KM in four different aspects: reach - access and connection to knowledge, depth - access to detail and amount of knowledge that can be effectively communicated, richness - provides multiple forms of knowledge, variety of knowledge and aggregation - large volume of knowledge extracted from different sources.
- d) **Common Knowledge:** Common knowledge refers to the cumulative experience of the organization to understand knowledge, activities and organizing principles that is used in communication and coordination. It provides unity to the organization. It includes vocabulary, common language, shared rules and norms, common shared knowledge and individual knowledge domains. It increases the value of individual's knowledge by integrating with

other's knowledge. This increase is specific to an organization and cannot be transferred to partners and competitors. So, it supports knowledge transfer within the organization not outside the organization.

- e) **Physical Environment:** Physical environment refers to the design of buildings of the organization; the location, size and types of offices; the nature of meeting rooms; and so on. It provides a physical space to educators to meet and share knowledge. It provides a space for both informal and formal knowledge sharing and ideas creation.

The building of KMS depends on the proper architecture and functionalities of KMS. The right combination of KM tools useful in building KMS is also of paramount importance. The KMS architecture describes the proper structuring of its different subsystems. The functionalities of KMS can also be described by the use of different subsections of the system. KM tools are foundational structures of building knowledge management system which is used to promote knowledge management. They use technologies and also involve some kind of structural or the organizational arrangement modes of operation for KM. The primary role of tools and technologies is knowledge discovery, the organization, sharing and creation.

5.5. KMS Implementation

The implementation of KMS rely on the readiness for change and that human factors are crucial for this change as change is not always perceived positively, knowledge of human abilities and limitations to the design of systems, organizations, jobs, machines, tools, and consumer products for safe, efficient, and comfortable use.

5.5.1. Types of KMS in Practice

The KMS system is designed for any the organization is dependent on its need. Broadly two types of architecture can be proposed to build an enterprise KMS. These are: *Centralized KMS* and *Peer-to-Peer (p2p) KMS*.

Maier (2004) argues that the *centralized KMS* architecture is based on the concept of a central KM server which offers and integrates all knowledge services shared in an organization. The key services provided in this type architecture are

"Data and knowledge services, Infrastructure services, Integration services, knowledge services, personalization services and access services." (Maier, 2004: p. 34)

- a) **Data and Knowledge services:** of KMS provide data from internal sources - transaction processing systems, data bases, data warehouses, content management systems, personal information management systems and external sources - e.g. databases from data supply companies, internet of the organization as source of knowledge.
- b) **Infrastructure services:** provide basic functionality for synchronous and asynchronous communication - sharing of data and documents, management of electronic assets and web content.
- c) **Integration services:** organize and link knowledge elements coming from various sources meaningfully in ontological and taxonomic fashion. The link between elements is also used to analyze the semantics of the organizational knowledge base. It is used to manage the meta-data of knowledge elements and knowledge workers using KMS.
- d) **Knowledge Services:** support the core processes of KMS such as discovery - search, retrieval, and presentation of knowledge elements and experts with techniques such as data mining, visualization, mapping etc., publication-authoring, structuring, contextualization and release of knowledge elements supported by workflows, collaboration - joint creation, sharing and application of knowledge by both providers and seekers with tools such as contextualized communication tools, location management tools, experience management tools, and learning - supported by authoring tools, learning paths, examinations, course management.
- e) **Personalization Services:** provide a method of effective access to large amount of knowledge elements. Specialists or manager can make a portion of KMS contents and services for specific roles. The personalization of both portals and the services can be done with the help of techniques such as interest profiles, personal category nets etc.

- f) **Access Services** allows user to access the KMS content with the help of different services that translate and transform the contents to and from KMS to heterogeneous applications. By using proper set of authentication and authorization tools, KMS content can be secured from eavesdropping and unauthorized use.

The overview of a centralized KMS is as shown:

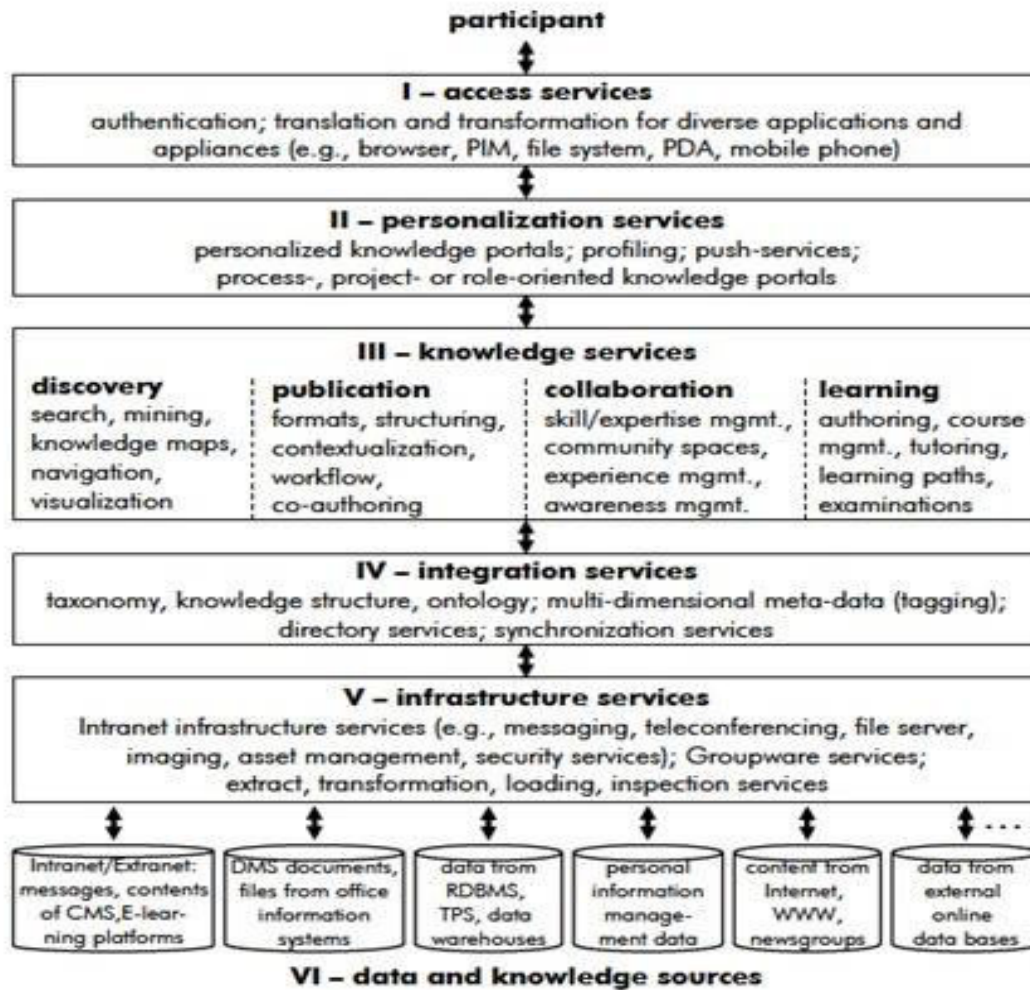


Figure (4) Centralized KMS. *Source:*

In KMS architecture (P2P KMS), Parameswaran et al. (2001), Maier and Sametinger (2004) have been used peer-to-peer metaphor with KMS architecture. The architecture of this KMS is also similar to centralized KMS only exception is with authentication or coordination mechanism. Every peer has client and server functionality associated with it. A peer is always connected with one single super-peer (server) which helps to make a cluster of peers. Sometimes super-peer

are connected with each other results in formation of peer-to-peer network. Requests from one peer are handled by the connected super-peer and then it is forwarded to other super-peers. The level of layers are same for both centralized KMS and peer-to-peer KMS except few exceptions.

Maier and Sametinger emphasize that "*Infrastructure services handle loading of knowledge from personal knowledge sources and provides peer-to-peer infrastructure to locate other peers*". They also focus that "*Integration services handle meta-data of knowledge objects and create a personal taxonomy or ontology of objects in the knowledge base.*" (Maier and Sametinger, 2004: p. 81) Hence, the knowledge base is divided in three areas: private, protected and public. Private workspace contains information that can accessed by owner only. Public workspace contains information that can be published on internet and can be accessed by undefined set of users. Protected workspace is accessed by a group of users. Consequently, Knowledge *services* build upon knowledge base such as in centralized KMS case. In this case the knowledge repository is dispersed among peers that have been granted access to a part of repositories. Ultimately, *Personalization services* are built upon user profiles and centralized personalization services provided by the super-peer. But the *Access services* are similar to that of centralized KMS.

In super-peer Parameswaran et al. (2001), Maier and Sametinger, (2004) suggest different scenarios for the key services of the architecture (server) as follows: *Infrastructure Services* access shared data and knowledge sources and helps the peers with additional services. It also provides services for looking up and message handling that improves efficiency of p2p KMS. *Integration services* offer a shared taxonomic or ontological design for the domain being handled e.g, by a network of subject experts. The super-peer offers a replication service to its peers which solve the problem related to the integration of knowledge bases of P2P KMS. *Knowledge services* are similar to that of centralized KMS having no central services in addition to peer services. *Personalization services* make easy access to the organized collection of quality knowledge for example, profiles and push services. *Access services* are related to the administration of centralized knowledge server and the personalization profiles.

One can argue that there are a number of benefits of the peer-to-peer which removes many problems associated with centralized KMS, such as reducing the cost associated with the design of centralized knowledge server, reduces the barriers of knowledge workers to participate and share content actively, to overcome the limitations associated with focus on internal knowledge of the organization by allowing to cross the organizational boundaries, to include instant messaging systems such as e-mails into knowledge work system and to integrate the shared knowledge workspace with knowledge workers personal workspace.

On the other hand, Tiwana (2001) identifies the biggest problem in implementing P2P KMS is the lack of proper access management and high cost. That is why most the organizations prefer a centralized KMS. The design of a fully function enterprise KMS is recommended to be composed of seven layers integrated with each other. These seven layers provide a guideline for the selection of right technologies that will help in effective sharing of knowledge across the enterprise. The functionality of these seven layers are illustrates below.

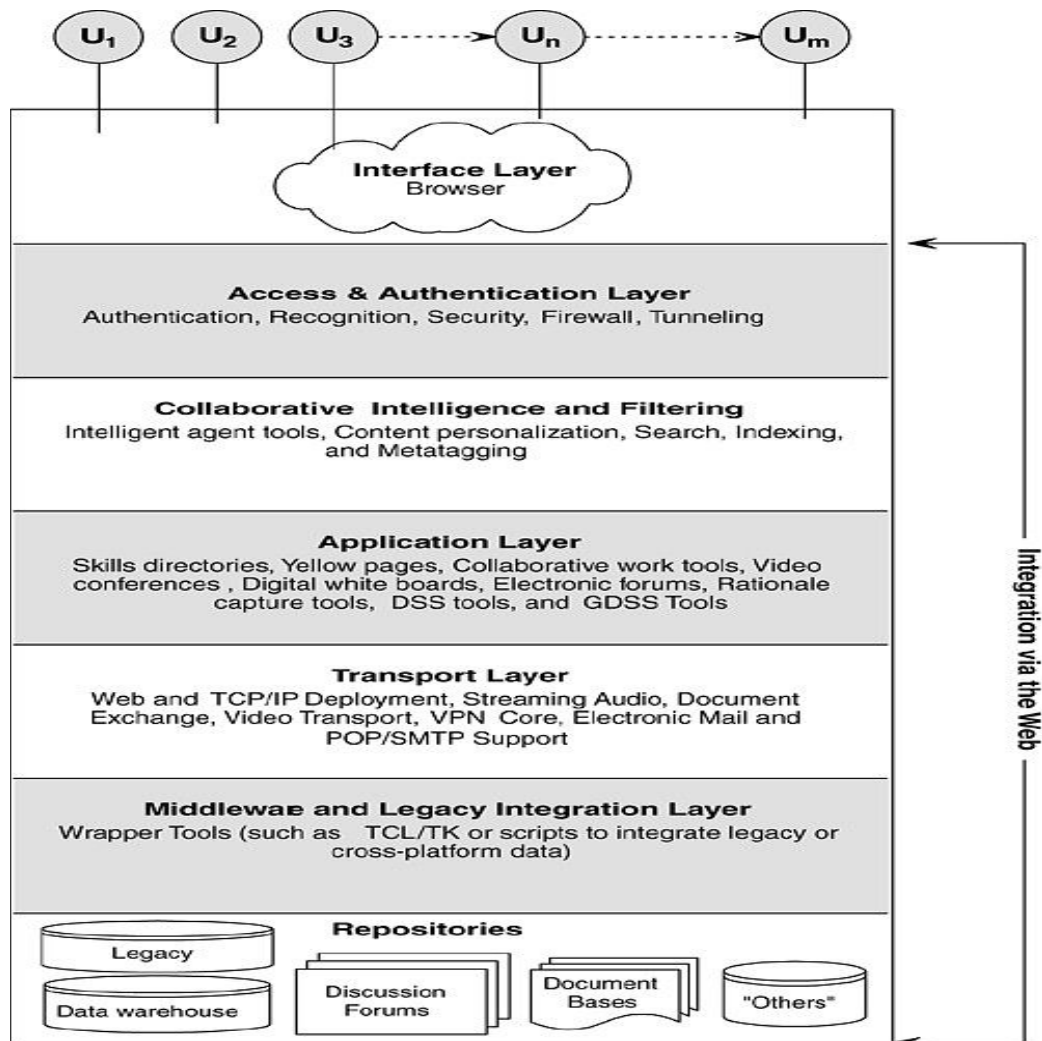


Figure (5) KMS architecture. *Source*

Overview of KMS architecture.

1. **Interface Layer** is the top most layer of KMS. This is the point where users interact with KMS. This can be easily built with an internet development tools and then customized according to users. This is the place from where content enters and leaves, hence it should be optimized to handle unconventional traffic such as audio, video contents. This interface should be independent of platform.
2. **Access and Authentication layer** is the layer where security mechanism is implemented. The security mechanism is implemented to secure KMS and raw data. This interface allows authorized users to use the system.
3. **Collaboration Intelligence and Filtering Layer:** The KMS intelligence lies in collaborative filtering which is associated with this layer. This layer helps

in transforming KMS from client/server to agent/computing model. This layer has implementation of intelligent algorithms to do most of the automated tasks such as filtering, tagging, navigation, subscription etc.

4. **Application Layer** handles applications such as directories, yellow pages, video- conferencing software, collaboration software, decision support tools. The applications of this layer should have functions and processes supporting KMS.
5. **Transport Layer** should be in operation when KMS is using network. These layers have components: TCP/IP connectivity throughout the organization, running webserver, running mail server, virtual private networks, and support for streaming unconventional files, such as video and audio files.
6. **Middleware and Legacy Integration Layer** provide connections between legacy data and new or existing systems and old and new data formats. Many tools and scripting languages can be used to build this layer.
7. **Data Repositories** is the bottom layer of KMS architecture. This layer consists of operational databases, discussion databases, web content archives, legacy data, digital contents, object repositories etc. The repositories are integrated with contextual information and sometimes tacit knowledge.

5.5.2. KMS Building Cycle

The KMS building cycle follows an incremental developmental cycle. KMS should be helpful in creating, organizing, storing, sharing and reusing knowledge. The KMS building cycle depends upon key features such as the organizational norms, technologies, external knowledge from partners and customers. Based on the above- mentioned key features the decision networks of key personnel designs a blueprint of KMS. The KMS building cycle is shown below.

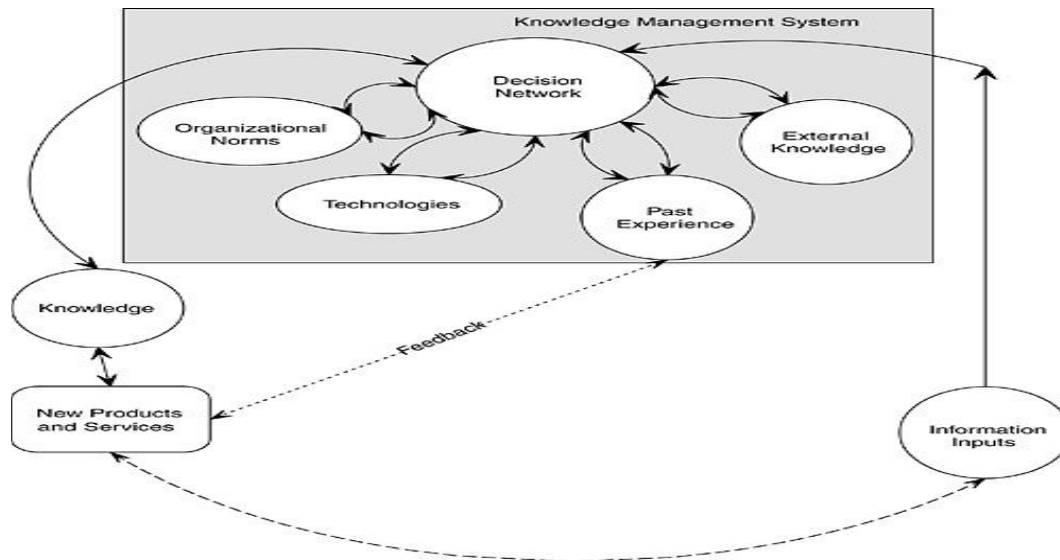


Figure (6) An Incremental Developmental Cycle for Building KMS.

Source:

Tiwana A (2002) discusses the way of building a KMS through using the draft of the architecture and various tools. The KMS cycle depends on the organizational norms, experiences of using previous KMSs, knowledge from consultants and customers, and various available technologies. The KMS performance is evaluated by users and based on their feedback and changes are made to KMS. As shown above, the organization can transform information into new services by using knowledge, past experiences and technologies.

5.5.3. Features of KMS

Rollet (2003) argues that to the selection and classification of technologies depends on their use. The technologies can be used in knowledge creation, codification and transfer. The features of KMS are defined on the basis of use of technologies needed for building KMS. The features of KMS can be defined as *Communication, Collaboration, Content Creation, Content Management, Adaptation, Networking and Artificial Intelligence*.

- a) **Communication** can be done by e-mail, chat, video conferencing. Many IT tools are available for this purpose, e.g. outlook, chat rooms, forums and video chat rooms. KMS facilitates a single access point from where people can interact with other people based on need

instantly. E-mails can be used for sending mails, chat rooms offer a platform for instant and informal chat, forum can be used for discussion on certain topics and video conferencing can be used for video conversation.

- b) **Collaboration** includes works such as group calendaring, workflow, groupware services. The collaboration may be synchronous or asynchronous. They may be collocated or at different locations. In this purpose different types of tools are used. Such as in case of synchronous collaboration people can use presentation, documents for collaborative writings, wikis for open editing on website etc. In case of asynchronous collaboration, shared data or knowledge repositories can be used. People can use chat or video if they are working collocated. When people are distant they can use e-mails for this purpose. Group calendars allow scheduling, project management and coordination among people.
- c) **Content Creation** includes creation of content in web format or documents. Most common content creation tools are authoring tools. Most commonly tools in this aspect are word processing, web page design software, wikis and blogs for sharing and publishing contents on specific topic. Annotation techniques can be used to make short comments to specific sections of the document. The document can be created and stored in version that helps in easy tracking of documents and contents.
- d) **Content management** is done to manage valuable content throughout the life-span of the content. It generally begins with content creation and handles multiple changes, updates, merging, summarizing, repackaging and archiving. Metadata can be used to manage the content in a better way. Tagging can be used to tag knowledge content. Taxonomy is used to organize and classify the content in a better way for easier retrieval and use. For this purpose predominantly content management systems (CMS) are used. CMS can be either proprietary CMS, e.g. Documentum, or open source

CMS, e.g. Alfresco, Plone, Joomla. CMS can display contents on web in proper format.

- e) **Adaptation** technologies are used to arrange content for a specific group of users who have common need. The arrangement of knowledge can be done by either *customization* or *personalization*. In *customization*, knowledge workers can change their environment based on their preferences. In *Personalization*, the content and interfaces are automatically changed based on observed and analyzed behavior of users. Based on profile of users, the personalization can be done by recommending few services or contents. The recommendation can be done also on similarity analysis of users having same interest. The tools in this case generally reorder or put items at one place based on the interest or desire of users.

- f) **Networking tools** are intranets, extranets, knowledge repositories, knowledge portals and web-based shared workspaces. These tools are used to share contents inside the organization or within the organizations for specific use. The knowledge repositories can be used to contain information related to concepts, definitions, assumptions, processes, events, actions, rationale for decisions, and circumstances for decision. Knowledge portals provide access to diverse enterprise content, groups, expertise, different internal and external services and knowledge base. The knowledge portals store and share contents through taxonomy (Collins 2003; Firestone 2003).

- g) **Artificial Intelligence** is related to the feature of KMS which assist users to use the system in an intelligent manner. Sometimes the system should work on behalf of users. The intelligent system should help users in newsgathering, content search and content filtering. It should have features, such as autonomous, the ability to interact with other software easily, responsive to change of environment, personalized to need of users, proactive, adaptive and should improve with experiences and easy usability (Khoo, Tor and Lee 1998). These applications can be used as watcher agents - looking for

specific information, learning agents - personalize to users preferences by learning from users past behavior, shopping agents, information retrieval agents and helper agents - perform tasks without external interferences.

5.5.4. KMS Tools

Dalkir identifies the tools used in building knowledge management system as "*Groupware Tools, Networking Tools, Data Warehousing Tools, Decision Support Systems, Content Management Systems, Document Management Systems and Artificial Intelligence Tools*" (Dalkir, 2005: p. 65).

Bebensee et al. (2010) define that Groupware as term related to the specific set of technologies assist people to work collaboratively. The prominent type of groupware tools are communication tools such as e-mails, wikis, file sharing, conferencing tools video/audio conferencing, chat, forums and collaborative management tools for managing group activities such as workflow systems, information management systems, project management systems. If groupware implemented successfully then these systems are very useful in sharing explicit knowledge through publishing and useful in knowledge creation through collaborative management tools. The sharing of tacit knowledge can be done by conferencing tools and the recording of conferences can be stored for future use. Applications used for this purpose are many such as Lotus Notes, SharePoint, Web 2.0. The web 2.0 has become an effective tool for two way communications on the internet. This tool includes blogs, wikis, social bookmarking, commenting, shared workspaces etc. The application of web 2.0 within the organizations is called as Enterprise 2.0 and its mapping to KM is KM 2.0.

Newell et al. (2000) name other prominent *networking tools* are intranet and extranet. The intranet is a small scale version of the internet used within the organization for connection between different operating systems. The extranet is an extension of the intranet to the organization's external network such as partners, suppliers etc. The intranet and extranet can be used in knowledge sharing, collaboration, publishing, searching documents and contents, transaction, interaction and recording.

Data warehousing in knowledge management is related to actions such as warehousing data, mining data, online analytical processing and data visualization. Data warehousing is storing data in a centralized system to have the means to present them in the form of sound information and knowledge. It contains information ranging from measurements of performance to competitive intelligence (Tanler, 1997).

Karahoca and Ponce (2009) suggest that data mining techniques used for the mission critical applications to filter, extract or transform datasets into summarized information and to explore hidden patterns in knowledge discovery. They identify six-step process of data mining as follows:

Business understanding > Data understanding > Data preparation > Modeling > Evaluation > Deployment
Online analytical processing (OLAP) tools performs these functions: query and reporting, multidimensional analysis, statistical analysis.

Liebowitz (1999) argues that data visualization is a graphical presentation of information. The information can be presented as graphical interfaces, tables, images, graphs and animation. The role of *Decision Support systems* is to access and manipulate data. They work with data warehouses, use OLAP tools and employ data mining techniques. "*The primary goal of decision support systems is to improve decision-making and solve the problem with the manager. Decision support systems enhance the knowledge of manager through knowledge discovery and providing relevant information*" (Liebowitz, 1999: p. 87). Hence, an effective decision support system is highly useful in knowledge management.

Sahu (2007) identifies "*Content management systems (CMS) as very relevant to knowledge management*". CMSs are used for creation, management and distribution of contents over internet. The efficient CMS should provide templates for publishing, option for tagging content with metadata, option for easy editing, version control mechanism, easy collaboration during work on content, integrated document management systems, workflow management and an extension for plug-ins for third-party software. An efficient CMS can be selected on the basis of technology -static and dynamic publishing of content, high performance, security and efficient search engine, ease of usability -the interfaces should be easy to use

keeping in mind that most users are non-technical, low maintenance cost, cross platform support, scalable and web presence management.

Document management system can be used in publishing, storing, indexing, and retrieving the relevant documents. These activities are done with explicit knowledge. This type of management system is very useful in case of large amount of documents. The most important functions of document management systems can be capturing the knowledge, classifying the knowledge using metadata, indexing the knowledge, searching and retrieving the knowledge and keeping track of different versions of documents. The use of document management systems reduces operational costs and improves the efficiency and speed of retrieval.

The *artificial intelligent tools* are predominantly intelligent filtering tools and intelligent information gathering tools. Intelligent filtering tools such as search engine are mostly used in case of filtering e-mails, news and documents. Intelligent information gathering tools collect the information about users and their activities to be used in other activities such as filtering of information. That's why the intelligent tools have become as important as the content (Wingfield 1995). Many intelligent tools can be used for looking for specific information - watcher agents, setting the content by learning user's past activities - learning agent, searching the best price for user - shopper agents, helping users to search most relevant content - information retrieval agents and helping users to perform tasks efficiently - helper agents.

5.6. Implications of KMS Models

For many years now, KM practitioners have been practicing KM. Many valuable empirical lessons and best practices have been garnered through experience with many diverse organizations. However, KM needs to be grounded in more robust, sound theoretical foundations-something more than it worked well last time. The key role played by KM models is to ensure a certain level of completeness or depth in the practice of KM: a means of ensuring that all critical factors have been addressed. The second practical benefit of a model-driven KM approach is that models enable not only a better description of what is happening but they help provide a better prescription for meeting organizational goals. KM models help to explain

what is happening now, and they provide us with a valid blueprint or road map to get organizations to where they want to be with their knowledge management efforts. Lai and Chu (2000) reviewed the influence that major KM models have had on KM practice and found that measurement was the most influential component. The next in terms of level of influence were culture (including reward and motivation components) followed by technology as a strong enabler of KM.

6. Conclusion

This chapter has elaborated on several key areas of knowledge management. The different activities that frame and guide for knowledge creation in educational organizations have been dealt with. The distinction between '*data*', '*information*' and '*knowledge*' has been discussed to clear the understanding. Special attention was also given to the central role of knowledge management approaches (KM models and cycles). The development of KMS philosophy with its perpetual quest for an understanding of knowledge underlines justifications of the activities. KMS has created a distinction between the theoretical background and the empirical implementation.

The notions of '*knowing how*' and '*knowing what*' are considered. Consequently, knowledge is understood to be what individuals know which involve the mental processes namely comprehension, understanding and learning that go on in the mind and can be enhanced by interaction with the world outside the mind, and interaction with others.

As presented, KM models are applied in a variety of settings to facilitate the understanding the basic tenets of managing organizational knowledge to be internalized and applied. Yet, there are some shortcomings of not being sufficient enough to explain all of the stages involved in managing knowledge. These models mainly focus on knowledge transformations processes and not addressing broader issues, such as how decision making takes place by leveraging different forms of knowledge.

KM cycle, on the other hand, dealt with two new critical phases: the learning of knowledge content and the decision as to whether to maintain such knowledge or divest the organization of that knowledge content. KM cycle is comprehensive.

The next chapter will widen the understanding knowledge management perspective and explore the KM profession and its interrelationship with different disciplines. It also will shade light on the capabilities of creating new knowledge and variables that are essential for knowledge management successful implementation.

Chapter II

Operational Studies of Knowledge Management

1. Introduction

In this chapter the researcher introduces the origins of knowledge management profession, starting with the argument that KM is found in the management, education and library and information studies. The field of knowledge management still maintains its wide diversity as the titles of these degrees range from computer science, management or business, cognitive psychology and library and information science degrees.

A process capability in KM is the organization's ability to create new knowledge through the process of converting tacit to explicit knowledge and eventually transforming it to organizational knowledge, and new knowledge stems from an organization's combinative processes. In the meantime, knowledge processes can be thought of as a structured coordination created in order to manage knowledge effectively.

The researcher will identify the main the variables. Such variables are essential to knowledge management successful implementation. These are of a great importance for organizational success, namely, (capacity building, knowledge workers involvement, teamwork, empowerment, top management leadership visible commitment, information systems infrastructure, performance measurement, organization culture, benchmarking knowledge management practices, knowledge structure, elimination of organizational constraints)

As to draw the readers' attention to the basic factors of knowledge management implementation, the researcher will present the role of the strategy to adapt the organization to the threats and opportunities in the environment with the given strengths and weaknesses of the organization.

Taking into consideration that the main aim of knowledge management is knowledge creation which starts with *Socialization*. The process of socialization starts with converting new tacit knowledge through shared experiences in day-to-day social

interaction. Tacit knowledge can be acquired through shared direct experience, for instance, one can share the tacit knowledge of colleagues by empathizing with them through shared experience. Example of daily routines will be given as part of tacit knowledge. because they are developed in close interaction over time

The researcher after presenting different parts of operational parts of knowledge management major categories of KM roles will be presented, namely (strategic roles, senior and middle knowledge leaders, management roles, knowledge managers, knowledge navigators, knowledge synthesizers, content editors, human resources roles, knowledge publishers, coaches and mentors, coaches and mentors).

2. Knowledge Management Profession

Al-Hawamdeh (2003) refers to KM as an emerging profession. The field of KM has slowly evolved from a consulting service to an internal business function. It has become an academic discipline being taught in universities worldwide. At the same time, many organizations are still in the process of defining their KM roles. There are a wide range of differing job titles and an even wider diversity in the backgrounds of KM practitioners. These factors contribute to the emergence of the KM profession. The KM field is fairly young when compared to older, more established professions such as law, medicine, or engineering. As the KM skill set continues to grow and show valuable contributions to the overall organizational goals, the profession will continue to mature and coalesce as a distinct field of professional activity. There are a number of certification initiatives underway that will help solidify KM's position as a bona fide field of professional practice and university programs in KM are proliferating, and new classes of KM graduates are entering the KM job market. In parallel with the emergence and coalescence of KM as both an academic discipline and a professional field of practice is a growing awareness of the need to incorporate ethics into the job description of each KM team member.

The Knowledge Management Resource Center lists a large number of universities that offer knowledge management courses and programs. In general, KM is found in the management, education, and library and information studies

departments of universities. Stand-alone special interest courses have evolved into degree programs at the undergraduate and graduate levels. Some sample KM courses can be found on site (http://mint.mcmaster.ca/mint/OLKM_Syllabi.doc). Quite a few doctoral students are doing their dissertations on KM topics and some of these are listed on the ICASIT web site.

Knowledge management has become more solidly established as a discipline as well as a field of professional practice. In parallel, KM qualifications now require more than having had a course or two in the subject, as many employers now require a degree or at least a specialization in KM. The field of knowledge management still maintains its wide diversity as the titles of these degrees range from computer science, management or business, cognitive psychology, and library and information science degrees. Moreover, a number of professional associations have created KM chapters such as the Special Libraries Association (<http://wiki.sla.org/display/SLAKM/>) that in addition to its excellent content is also a site with wikis, communities of practice, and many web 2.0 features.

3. Knowledge Management Processes

Cascella defines *"a process capability is any performance characteristics or attributes of a process required if the process goal is to be consistently and reliably achieved and an organization can achieve true CA by maintaining „unparalleled excellence in not just one, but several core processes"* (Cascella 2002: p. 198).

A process capability in KM is the organization's ability to create new knowledge through the process of converting tacit to explicit knowledge and eventually transforming it to organizational knowledge (Nonaka and Takeuchi 1995), and new knowledge stems from a organization's combinative processes (Kogut and Zander 1996). Similarly, Pentland defines KM processes as *"an ongoing set of practices embedded in the social and physical structure of the organization with knowledge as their final product"* (Pentland, 1995: p. 24). Effective KM processes should be conducted frequently, consistently, and flexibly (Grant 1996a).

Gold, Malhotra and Segars assert that *"knowledge processes can be thought of as a structured coordination created in order to manage knowledge*

effectively. In particular, KM process capability is essential to „enable the organization to capture, reconcile, and transfer knowledge in an efficient manner“, thereby, providing „a useful theoretical foundation for defining important aspects of organizational capability" (Gold, Malhotra and Segars, 2001 : p.186).

3.1. Acquisition Processes

Acquisition-oriented KM processes are those oriented toward obtaining knowledge which can be described by many other terms such as acquire, seek, generate, create, capture, and collaborate, all with a common theme – the accumulation of knowledge (Gold, Malhotra and Segars 2001). According to Chakravarthy argues that "*knowledge is accumulated when units within the organization as a whole gains new understanding*" (Chakravarthy, 2005: p. 34).

Knowledge creation and acquisition are both important sources of new knowledge for an organization . The former is concerned with the development of new organizational knowledge in the organization , including the improved use or new application of existing knowledge, while the latter represents a flow of knowledge from external stocks of knowledge into the organization. The full value-creating potential of new knowledge can only be realized through knowledge capture which can include both knowledge personalization and codification strategies (Boisot 1999) .

Discussing these processes, Gold, Malhotra and Segars (2001) concentrate on two aspects: benchmarking and collaboration. In particular, through benchmarking, an organization identifies outstanding practices from organizations (including itself), assesses the current state of a particular process to identify gaps and problems and then captures the knowledge for use internally (O'Dell and Grayson 1998). Collaboration can take place at two levels within the organization: between individuals and between the organization and its network of business partners and both are potential sources of knowledge (Inkpen 1996; Inkpen and Beamish 1997; Inkpen and Dinur 1998; Nonaka and Takeuchi 1995).

3.2. Conversion Processes

Conversion-oriented KM processes are those oriented toward making existing knowledge useful, which can be enabled by some of the processes such as organize, represent, integrate, combine, structure, coordinate, or distribute knowledge (Gold, Malhotra & Segars 2001).

According to Lee and Suh (2003), knowledge is not easily to be shared and collected but needs to be converted for use in the business environment. First, without common representation standards, no consistent dialogue of knowledge would exist, and this would make it hard to effectively manage. Secondly, knowledge needs to be integrated and combined if strong organizational capabilities are to emerge. In particular, integration focuses on making the assembled knowledge resources function together to create an organizational capability that can form the basis for new products or services, serving as a platform for expansion into new competitive arenas. Finally, knowledge should be distributed to the organizational unit where it is needed .

3.3. Application Processes

Application-oriented KM processes are those *"oriented toward the actual use of the knowledge, making knowledge, more active and relevant for the organization in creating value"* (Bhatt 2001: p.69). Process characteristics that have been associated with the application of knowledge within the literature include storage, retrieval, application, contribution, and sharing.

According to Nielsen (2006), application processes are related to knowledge leverage and exploitation, among which knowledge leverage entails the search for new ways to exploit the integrated knowledge-based resources of the organization in as many ways and in as many competitive arenas as possible. Meanwhile, the performance of an organization is dependent on the ability to exploit its integrated knowledge resources in order to create and deliver products and services to its customers utilizing its organizational capabilities (Nielsen 2006).

Grant mention that *"the knowledge-based theory of the organization posits that the major source of competitiveness rests in the ability to apply knowledge and not in the ability to create new knowledge per se"* (Grant 1996: p. 111). Effective

application of knowledge has helped companies improve their efficiency and reduce costs.

3.4. Protection Processes

Security-oriented KM processes are those oriented toward the protection of knowledge within an organization from illegal or inappropriate use or theft (Gold, Malhotra & Segars 2001). More specifically, according to Appleyard (1996), protection encompasses activities that seek to maintain the proprietary nature of a organization's knowledge stocks which include seeking legal protection, designing policies to limit turnover, and educating employees about the types of knowledge they should not share with their peers in other organizations. Organizations can also take a variety of actions to shape the characteristics of their knowledge base which increase stickiness and imitation barriers, including tacitness, complexity, and specificity.

When knowledge is applied to existing ends, the size and durability of a organization's CA will be defined by how well it protects its knowledge (Chakravarthy et al. 2005). This is because knowledge as an asset is the source of a CA only when it is rare and inimitable (Barney 1991). Therefore, protection processes are very important for an organization.

4. Knowledge Management Capability Components

KM capability has been recognized as a key factor for gaining and sustaining a CA (Corsoa et al. 2006). Extending the traditional notion of organizational resource-based capability to an organization's KM function, an organization's KM capability is defined as, its ability to mobilize and deploy KM-based resources in combination with other resources and capabilities' leading to SCA (Chuang 2004).

The theoretical issues related to developing the interrelationships among the three key components of KM capability, namely technical KM infrastructure capability, social KM infrastructure capability, and KM process capability.

4.1. Technical and Social KM Infrastructure Capabilities

The interwoven nature of organizational knowledge infrastructure elements is extensively discussed in the literature (Zheng 2005). Lee and Lee (2007) con organization that there are positive correlations among organizational factors, including T-shaped skills, decentralized organizational structure, learning organizational culture, and IT support. For example, Nonaka and Takeuchi (1995) develop a new organizational structure that is intricately tied to the knowledge culture of the organization. Zheng, Yang and McLean's (2010) study also shows that organizations that are adaptive, consistent in their values, engaging to employees, and embracing common missions in their cultures are more likely to have a decentralized structure that facilitates a knowledge-friendly environment.

Without a supportive culture stressing why the application of a technology is vital to the organization, no matter what technology base is established, the adoption rate can remain very low (Gold 2001). Technology, on the other hand, is also able to assist in negating some cultural issues especially in international markets and in overcoming space and time barriers for group interactions, enabling knowledge workers to share their expertise and improve collaboration and communication among employees at all levels and all locations, regardless of structural boundaries and even across organizations (Weill & Broadbent 1998). However, in shaping the technical infrastructure capability for CA, the human skills which creatively and effectively combine, integrate, coordinate, and utilize IT components are the more important factor, not the IT infrastructure itself (Kim, 2001).

4.2. KM Infrastructure and Process Capabilities

Although little research has been undertaken to explore the relative importance of KM infrastructure capability in relation to KM process capability, a central proposition has been examined that the characteristics of knowledge enablers/infrastructure should influence KM processes (Gold *et al.* 2001). Whereas knowledge processes represent the basic operations of knowledge, enablers (or influencing factors) are the overall organizational activities or mechanisms that provide the infrastructure necessary to stimulate knowledge creation, facilitate the sharing of knowledge, and protect knowledge in an organization, increasing the efficiency of KM processes.

According to the theory of social capital, infrastructure elements enable maximization of social capital by providing a mechanism for the social interaction of individuals (Gold *et al.* 2001). Knowledge, or intellectual capital, is created through the process of exchange and combination that occurs within the social network of an organization. Closely tied to the theory of social capital, the KBV of the organization also highlights the effective means of coordinating individuals' activities within the organization and integrating their knowledge. This is where the role of organizational infrastructure elements comes into play to effectively manage the organization's knowledge (Gold, 2001).

Lee and Choi (2003) empirically examine the impact of various KM enablers on the knowledge creation process. Some other researchers such as Appleyard (1996), Hansen (1999), Lee and Lee (2007), Szulanski (1996) and Zander and Kogut (1995) recognize KM enablers or infrastructure as preconditions of KM processes. Smith (2006) also finds empirical evidence for the causal relationship between these two dimensions of KM capability. Specifically, knowledge infrastructure capability is the driver of knowledge process capability across organizations and, consequently, improvements in the former will lead to strong and positive improvements in the latter.

In addition, the role of each KM infrastructure element from social and technical perspectives including culture, structure, people, and IT. Specifically, organizational structure, culture, people, and IT are important independent variables affecting the facilitation of the knowledge processes. "*Organizational structure can inhibit or enable effective KM through the influence of the structural framework in place and the way this framework facilitates knowledge creation and innovation*" (Dilnutt 2000: p. 87). In the New Economy, successful organizations are characterized by simplicity and flexibility of organizational design (Beveren 2003). Thus, organizations need to change from having hierarchical departmentalized structures to flatter, organic, network styles which facilitate transferring and creating knowledge for the organization (Beveren 2003; Gehani 2002; Pemberton and Stonehouse 2000), resulting in more activated KM activities (Lee and Lee 2007).

In relation to the functions of *organizational culture*, it is argued that organizational culture is one of the most important factors for the successful implementation of KM efforts. Organizations should establish an appropriate culture that encourages people to create and share knowledge within an organization. The key elements of a knowledge culture are a climate of trust and openness in an environment where constant learning and experimentation are highly valued, appreciated and supported. Moreover, a knowledge culture also encourages debate and dialogue between individuals or groups to facilitate the creation of new ideas and knowledge as well as the transmission of tacit knowledge between individuals or the conversion of tacit knowledge into explicit knowledge, thereby transforming it from the individual to the organizational level.

Human resources have been also recognized to be at the heart of creating organizational knowledge. Since knowledge resides in people's heads, managing people who are willing to create and share knowledge is an important task. Thus, organizations need to find new sources of motivation to increase the participation in knowledge creation and sharing. As discussed earlier, among the different kinds of skills and knowledge Leonard-Barton argues that *"make up the dimension most often associated with a core capability, T-shaped skills and knowledge of employees are the most critical element as the possessors can explore the interfaces between their particular knowledge domain and various applications of that knowledge in particular products, thereby facilitating the process of knowledge creation, sharing and application"* (Leonard-Barton 1995: p. 154).

Finally, there are a number of fundamental reasons to justify the role of *information technology* as an enabler of KM. For example, Davenport and Prusak (1998) argue that information systems are essential for the storage and retrieval of information and explicit knowledge. Moreover, due to the impacts of globalization, IT is particularly useful in overcoming the barriers of distance and time which affect some knowledge workers, enabling collaborative teamwork, knowledge sharing and integration. Leonard-Barton (1995) and Grant (1996a) propose that the technological dimensions that are part of effective KM include business intelligence, collaboration, distributed learning, knowledge discovery,

knowledge mapping, opportunity generation, and security. More specifically, Alavi and Tiwana (2005) categorize key information technology tools that may be applied to support the various organizational KM processes, including (1) e-learning and collaboration support systems for the creation process, (2) data warehousing, data mining, and repositories for the process of storage and retrieval, (3) communication support systems and enterprise information portals for the transferring process, and (4) expert and decisions systems for the process of applying knowledge.

5. KM Optimal Variables

The identification of the main the variables which are essential to knowledge management successful implementation are of a great importance for organizational success. Choi (2000) argues that knowledge management program needs to identify critical performance factors to gauge its performance.

A number of knowledge management models would be reviewed to develop a unified knowledge management framework. Davenport *et al.* (1998) identified eight knowledge management success factors such as technology infrastructure, organizational infrastructure, balance of flexibility, evolution and ease-of- accessibility to knowledge, shared knowledge, knowledge -friendly culture, motivated workers who develop, share and use knowledge, means of knowledge transfer using various information technology infrastructure, and senior management support and commitment. Ryan and Prybutok (2001) suggested five success factors such as an open organizational culture, senior management leadership and commitment, employee involvement, teamwork and infomlation systems infrastructure. Moffett *et al.* (2003) propose a more comprehensive list of success factors. Ten key components to successful knowledge management are identified: a friendly organizational culture, senior management leadership and commitment; employee involvement, employee training, trustworthy teamwork, employee empowerment, information systems infrastructure, performance measurement and benchmarking and knowledge structure.

One can notice that there are differences of the aforementioned models. These differences come from researchers' background and interests. Hence, none of the models can provide a complete and generalized frame for knowledge management by defining fundamental attributes of knowledge management and their interrelationships.

a) Capacity building

Capacity building is an important factor to the success of knowledge management implementation. Salleh and Goh insist that *"if a company wants to become a truly knowledge-based organization, it must start with quality training"* (Salleh and Goh, 2002: p. 34). The workforce of an organization is considered to be an important competitive advantage. Educators are to be competent through building their capacities continuously. Professional development programs provide knowledge workers with the skills and information to fulfil their duties. Improved performance is a strategic goal for organizations to achieve its ultimate goals. Consequently, organizations become learning organizations. Such learning organizations view capacity building as a strategic investment rather than a budgeted cost (Mondy et al., 2002).

A number of researchers have emphasized the importance of capacity building for learning organizations. Cameiro (2001) recognizes that special attention should be paid to educators concerned with preserving intellectual capital. Garavan *et al.* (2000) considers daily task of human resource development in building of a learning organization as: assisting educators in creating and using knowledge, establishing appropriate networks, and engaging in double-loop learning. Greco (1999) argues that one of the key elements of successful knowledge management is the professional development to help educators recognize value of knowledge and therefore sharing such knowledge. Hwang (2003) assures that the importance of role of workforce in organizations to possess the learning capability to use knowledge creatively cannot be directed at sustaining profitability unless the educators are given suitable capacity building.

b) Knowledge Workers Involvement

Researchers and practitioners such as Wilson and Asay (1999), Choi (2000), Hall (2001), Ryan and Prybutok (2001), Moffett et al. (2003) and Hung et al. (2005) find out that knowledge workers involvement is one of the critical factors for knowledge management implementation success. Leaders are realizing that employee's knowledge is a critical resource for competitive advantage, so they encourage educators to share this knowledge. According to Lawler (1992), creating a high involvement organization involves making choice about organizational design that creates a world in which individuals know more, do more and contribute more. Crause O'Brien (1995) recognized that the importance of the employees' tacit knowledge to have successful performance improvement may depend on how work is organized, the skill of the knowledge worker, the mostly on the commitment of the educators to convert tacit knowledge of the work process into continuous process improvement and innovation.

Knowledge workers involvement as a technique is aimed at sharing information, creating knowledge, and authority (Steinecke, 1993). It is a suitable technique to gather knowledge from various levels of management and essential for an organization to survive. Hall (2001) argues knowledge creates knowledge when it is shared. Problems faced by organizations can be resolved through knowledge management where employee involvement and commitment is emphasized. Binney (2001) mentions that the focus of knowledge management application is on providing an environment in which knowledge workers of various disciplines can come together and create new knowledge. By agreeing on common presumptions and analytical frameworks, knowledge workers can coordinate diverse sets of activities and solve organizational-wide complex problems (Bhatt, 2000).

Knowledge workers involvement has been viewed as one of the most effective problem-solving and process improvement principles of total quality management (Silos, 1999). Their involvement is important in successful knowledge management implementation because since they must share the nature of knowledge creation and sharing, many knowledge management activities are unthinkable without their involvement (Choi, 2000).

c) Teamwork

Teamworks make more creative and informed decisions and coordinate work without the need for close supervision. As such, teams are replacing individuals as the basic building blocks of organizations (Choi, 2000). Many researchers have recognized teamwork as one of the critical factors for successful knowledge management implementation. Demarest (1997) mentions that effective dialogue within a knowledge management team is essential if knowledge is to be embodied and disseminated. Teams are the units that actually carry out the work in many knowledge-intensive organizations (Mohrman *et al.*, 1995). They are the ones that must access and apply distributed knowledge effectively (Haas, 2002).

Teamwork is an essential source of the knowledge generation process (Choi, 2000). A well-staffed team is crucial for successful implementation of knowledge management (Civi, 2000). That is because tacit knowledge that individuals possess may be difficult to articulate because it is so deeply embedded in routines and practices that are taken for granted (Nelson and Winter, 1982). Through creating teams, organizations are able to apply diverse skills and experiences towards its processes and problem-solving (Choi, 2000). The focus of knowledge management application is on providing an environment in which knowledge workers of various disciplines can come together and create new knowledge (Binney, 2001).

Nadkarni (1995) proposes that educators must work together and build on each other's ideas and strengths. Moreover, Phillips (1994) believes that teamwork can be developed by creating meaningful relationships within the team. This is because organizations with team oriented educators who trust one another are more successful at sharing knowledge than those who are merely technologically superior (Geraint, 1998). Thus, fostering a spirit of teamwork based on trust is an essential factor for the successful implementation of knowledge management in organizations.

d) Empowerment

Pickering and Matson (1992) define empowerment as the process of eliminating the bureaucratic controls and creating a sense of freedom so that

people can commit all their talents and energies to accomplish their shared goals. Hence, empowered educators become more autonomous, independence and discretion in doing their work activities. They are proactive in performing assigned task. Empowered educators also have control over performance feedback that guides their work and also a feeling of self-efficacy; that is, they believe that they are capable of successfully completing the task.

Verespej (1999) argues that the real advantages of knowledge management implementation could not be realized without truly empowering the educators. Without the appropriate knowledge and skills, it is almost impossible for knowledge workers to perform their jobs effectively (Lawler, 1992). They need knowledge that will enable them to comprehend and contribute to the performance of the organization (Bowen and Lawler, 1992). Consequently, when a knowledge worker is empowered, he begins to take extra responsibilities to solve organizational problems by learning new skills in his jobs (Anahotu, 1998), which will eventually lead him to be more competent.

Effective creation and sharing of knowledge would not be utilized effectively if knowledge workers do not have a sense of ownership in the overall aim of the organizational knowledge management system. Choi, (2000) suggests that most organizational knowledge comes from the expertise, learning and experience of their educators. Through empowerment, Martinez argues that *"knowledge workers can value their colleagues' expertise and help them communicates their knowledge by creating ways to capture, organize and share knowledge"* (Martinez, 1998: p. 368). Thus, it can be concluded that empowerment is recognized as one of the critical implementation factors to the success of knowledge management.

e) Top Management Leadership Visible Commitment

Top management leadership commitment is essential for knowledge creating and culture sharing activities. Chard (1997) argues that top management recognizes that the knowledge inherent in an organization is an extremely valuable asset, and that it is no longer sufficient to leave it unmanaged and underleveraged. Furthermore, Dutta (1997) suggests that the effective management of knowledge is increasingly seen as an important basis for competitive advantage.

While, Choi (2000) contends that poor leadership quality has been identified as a threat to successful implementation of knowledge management.

Leadership commitment to the knowledge management process is essential (Kalling, 2003). Generally, leadership is responsible for creating the knowledge vision of the organization, communicating that vision and building a culture that regards knowledge as a vital organization resource (Pemberton *et al.*, 2002). It is therefore important that senior management recognizes its importance and buttresses the development of programs and policies to make it real (Greengard, 1998). Civi (2000) argues that without the support of senior administrators, the success of knowledge management activities is cumbersome. Efficient leadership provides the necessary direction to implement and effectively deploy a knowledge management strategy (Hansen et al., 1999). To realize the potential of knowledge management, Abell and Oxbrow give special attention to *"organization leadership must provide the proper environment to motivate its workers to enable the creation, organization and sharing of knowledge"* (Abell and Oxbrow, 1999).

One can conclude that senior leaders play a major role in implementing knowledge management. Goh and Salleh (2002) assert that the leadership skills are essential to the middle level manager and to maintain educators' morale during the difficult change period. So, the visible leadership commitment should be sustained throughout a knowledge management effort

f) Information Systems Infrastructure

Savary (1999) insists that an effective information systems infrastructure is necessary for the organization to implement the knowledge management process. Information technology can provide a value to knowledge management (Bhatt, 2001). Bontis *et al.* (2000) propose structural capital includes the databases, organizational charts, process manuals, strategies and routines and anything whose values to the organization are higher than its material value. Furthermore, Davenport *et al.* (1998) point out two most critical factors for the successful knowledge management project, one is the establishment of a broad information systems infrastructure based on desktop computing and communications. The second is being the utilization of the network technology

infrastructure such as the Internet, IBM Notes and global communications systems for effective transfer of knowledge. Despres and Chauvel (1999) report that knowledge bases and intranets are the most popular ways of implementing knowledge management. Ghilardi and Mellor (1997) also argue that "*the two critical components in a successful knowledge management system are the process and information systems.*" (Ghilardi and Mellor, 1997 : online article) They also recommend that information resource-center staff should play a critical role in both these areas.

Boudreau and Couillard (1999) mention that information systems have provided knowledge management with capabilities which are not possible before. It has helped an organization to manage and leverage its knowledge systematically and actively (Storck & Hill, 2000). Consequently, without effective information technology and computers, knowledge cannot be stored.

g) Performance Measurement

Bavon (1995) defines performance measurement as the collection of information about effectiveness and productivity of individuals, groups and larger organizational units. In the same track Carneiro considers "*performance measurement to be one of the key areas of the organization, such as expansion , innovation and productivity, which is critical to the development of prosperity of an organization*" (Carneiro, 2001 ; p. 65).

Carneiro (2001) suggests that organizations can measure some of its intangible assets and use non-financial ratios or indicators for measuring management efficiency. According to Bassi and Van Buren, "*the intellectual assets of a organization include not only the educators' know-how, but also its business processes and customer knowledge as well*" (Bassi and Van Buren, 1999 : p. 137).

Pearson (1999) insists that effective knowledge delivery can be achieved by finding the right system of measurements, as well as better ways of building and delivering the right information to the right people at the right time. One of the recent developments of intellectual capital measurement model by the American Society of Training and Development Working Group

reveals two perspectives. One is a core set of measures to enumerate the intellectual capital stocks that are common to most organizations. Most of the solutions geared towards profit making in commercial organizations; measuring intellectual capital and the intangible assets on the organization balance sheet is an example (Edvinsson & Malone, 1997). The second set of key measures of financial performance is to evaluate effectiveness (Van Buren, 1999).

Bukowitz and Williams (2000) argue that creating a new theory of the organization that explicitly includes intangibles has been a central focus for knowledge management practitioners. Regardless of the type of knowledge (tacit or explicit), its contribution must be measurable not only by traditional financial measures but also by other performance measurements. Knowledge must be measured because the intellectual capital of an organization includes the brain of its educators, their know-how, the processes and educators knowledge that they create (Choi, 2000). Thus, it is clearly necessary to include performance measurement system as a key factor for the successful knowledge management implementation.

h) Organization Culture

Ribiere (2001) argues that knowledge researchers and practitioners are focusing now on the realization of the importance of the "soft" aspects of knowledge management initiatives. Jager emphasizes that *"culture practices reflect how the organizations view and facilitate both learning and innovation, including how it encourages educators to build the organizational knowledge base in ways that enhance values for the educators"* (Jager, 1999: p. 97).

Schermerhorn et al (1991) define culture as a set of beliefs, which provides an identity for the organization, which in turn defines how the organization runs day to day. The set of beliefs includes organizational purpose, criteria of performance, the location of authority, legitimate base of power, decision-making orientation, leadership style, compliance, evaluation and motivation.

Organizational culture as a concept is considered to be a key element of managing organizational change and renewal (Pettigrew, 1990). It has been

identified that the biggest challenge in knowledge management is not a technical one but a cultural one (Forbes, 1997; Koudsi, 2000). Chase (1997) reviews an international survey of the approaches adapted to knowledge management in 500 organizations reveals that 80 % of respondents cited "existing organizational culture" as a major barrier to the implementation of knowledge-based system. Similarly, another survey on 430 organizations finds that a majority of respondents recognized that their internal cultures represent a major barrier to effective knowledge transfer, and that educators' behavior would have to alter (Skyrme & Amidon, 1997).

To respond to this demand, Larson (1999) emphasizes the consideration of the cultural environment of an organization before implementing knowledge management. Gupta et al. (2000) suggests that an open culture built around integrating individual skills and experiences into organizational knowledge will be more successful. As Buckman (1999) points out, creating and sharing knowledge are intangible activities that cannot be forced. Meanwhile, Scarborough *et al.* assure that "*a culture of confidence and trust is required to encourage the application and development of knowledge within an organization*" (Scarborough *et al.*, 1999: p. 117).

i) Benchmarking Knowledge Management Practices

Camp (1989) describes benchmarking as the systematic process of searching for professional best practices that lead to superior performance. Benchmarking determines how the leading organization achieves those performance levels and uses the information as a basis for the organization's targets, strategies and implementation (Karlof & Ostblom, 1993).

Choi (2000) Davis (1996) mention that benchmarking is a very well-known management tool and it has played an important role in implementing knowledge management and to gain competitive advantage. Many large organizations have adopted benchmarking as a significant, systematic technique for measuring the companies' performance toward its strategic goals (O'Dell, 1996). Davis drawing our attention that "*managing knowledge work effectively is becoming a necessity for functional area heads and department administrator*

s, once an organization has benchmarked best practices, it is easier to apply the useful knowledge around the organization" (Davis, 1996: p.).

Day and Wander's (1998) study provides a practical implication for a wider view of knowledge management benchmarking. They insist that it is necessary to develop knowledge strategy in order to capture, share and manage organizational knowledge correctly, and one of the knowledge strategies would be benchmarking.

Benchmarking has been one of the most effective tools for developing and improving knowledge management as it is not limited just to process improvement or reuse. It extends far beyond and promotes both the growth and acceptance of a learning culture throughout the organization. Benchmarking efforts can often provide insights to an organization into areas such as overall productivity; service quality; customer satisfaction; time to market in relation to other competitors ;costs, profits and margins; distribution and relationships and relationship management; which impact its competitive advantage (Choi, 2000).

j) Knowledge structure

Choi (2000), Hsieh et al., (2002) and Wenger & Snyder (2000) argue that knowledge creation can be based on numerous sources. Knowledge can be created individually, in groups and on an organizational level. Specifically, reliable, useful, up-to-date and timely knowledge can be captured and created by sharing knowledge with other members of work groups, suppliers and customers. Many researchers have identified knowledge structure as one of the critical factor for successful knowledge management implementation.

Since organizations are striving to improve their bottom line, many of them have realized the importance of educators and their sources of performances and practice innovation. Many educational organizations have brought educators into the organization fold to share ideas for their teaching practices development and refinement decisions and to come up with new,

innovative ones. Organizations are striving to form strategic partnerships with customers so that the relationship becomes a long-term proposition (Bukowitz and Williams, 2000). Knowing the importance of educational knowledge workers, there must be a well-established knowledge structure, which includes knowledge about internal and external practitioners as well as organizational work groups in order to implement knowledge management successfully (Choi, 2000).

Wenger and Snyder (2000) claim that as a complement to the practice of knowledge sharing, a new organizational form, called community of practice has emerged where individuals with common professional goals and interests provide a natural focal point for organizing and promoting knowledge in a particular area (Bukowitz and Williams, 2000). These communities help to provide solutions to organizational problems, as well as to provide insight on new or innovative learning experience. Davenport and Klahr (1998) argue that the management of educational knowledge worker is becoming increasingly important to organizations because of rapid product changes and the growing need for service-based orientation. Thus, the establishment of a well-defined knowledge structure would be another critical factor for successful knowledge management implementation.

k) Elimination of Organizational Constraints

Successful knowledge management implementation may not be achievable if organizations cannot eliminate organizational constraints that present in an organization (Clarke and Rollo 2001). This is because organizational constraints can affect negatively the perception and/or attitudes toward knowledge management success (Choi, 2000).

Organizational constraints lead to inefficiency, ineffectiveness and powerlessness. They tend to create hierarchical bureaucracy with few incentives to innovate. Hierarchical bureaucracy means every task is broken into simple parts, each has the responsibility of a different level of educators, and each defined by specific rules and regulations (West, 1992). Organizational constraints result in

not only a rigid preoccupation with standard operating procedures, but vertical chains of command and slow response as well (Choi, 2000).

Chase (1997) reports that organizational culture is seen as the biggest obstacle to creating a knowledge-based organization accounting for 80 % of the barriers. Other barriers include lack of ownership of the information (64 %), lack of time (60 %), and information and communications technology (55 %). According to Gumbley (1998), technology used to build knowledge management system can be very simple, but the real issue lies in persuading people to give up their knowledge to a central repository, and in building a culture in which knowledge can be effectively exploited. McDermott and Dell (2001) cite many examples where well-designed knowledge management tools and processes fail because people believed they were already sharing well enough and that senior administrators did not support it. Other obstacles to the proper implementation of knowledge management project includes *"educators' unwillingness to share information, the difficulty involved in selecting the best way to store corporate information and the language differences in networks"* (McCune, 1999: p. 24).

Bonaventura (1997) claims that rigid regulations, lack of incentives to be creative and lack of commitment in budgeting and funding would be problems for the knowledge management implementation. Thus, for a knowledge management program to be successful, organizations must strive to eliminate all the constraints that impede knowledge management implementation success.

6. Knowledge Construction

Organizations are interested in managing knowledge for several reasons. Core competencies are based on the skills and experiences of the people who do the work, and may not exist in physical form (Manville and Foote, 1996). Therefore, it is important that organizations find a way to tap into this knowledge base in order to preserve and expand their core competencies. Some believe that knowledge is the driving force in today's economy. Hence, it becomes critical for an organization to find ways to accessing existing knowledge and creating new knowledge.

When knowledge within the organization is shared, it becomes cumulative. It becomes embedded within the organization's processes, products, and services

(Demarest, 1997). Grant asserts that "*tacit knowledge is demonstrated only in its application. The goal should not be to capture what everyone knows so that everyone has the same knowledge, but to combine the various levels of expertise present to create new organizational knowledge*" (Grant, 1997: p. 135).

There are several benefits of knowledge management that can be anticipated (Lank, 1997). Educators will spend less time looking for information and expertise. This will enable highly paid professionals to concentrate on their area of expertise. A knowledge management process will help educators to improve their performance and employability, by expanding resources immediately available to them and enabling them to make more intelligent decisions. An effective knowledge management process will also generate less stress for educators trying to do more with fewer resources. Knowledge management, consequently, will help organizations become more competitive by using new knowledge to reduce costs, increase speed, and meet customer needs (Grayson and O'Dell, 1998).

Jarrar (2002) outlined the following benefits of KM perceived from the analysis of a study reviewing the experiences of 40 organizations in KM: contributes to increased competitiveness:

- improves decision making and avoidance of wasted time;
- increases responsiveness to customers;
- encourages educators who are not natural net-workers to engage in knowledge sharing and discourages information hoarding;
- improves support among colleagues because they value the knowledge and help they receive;
- improves efficiency of people and operations and better products and services.

6.1. Knowledge creation

Nonaka (1994) and Drucker (1993) believe that the capabilities to create and utilize knowledge are important activities to consider knowledge as an essential element for the organization to be a learning organization. Management scholars, on

the other hand, conceptualize knowledge creation as a dialectical process, in which various contradictions are synthesized through dynamic interactions among individuals, the organization, and the environment (Nonaka & Toyama, 2002). So, knowledge is created in spiral concepts such as tacit and explicit, deduction and induction, and creativity and efficiency. The dialectic synthesis is the integration of opposing aspects through a dynamic process of dialogue and practice.

Giddens argues that "*knowledge creation is a transcending process through which entities - individuals, groups, organizations, etc.- transcend the boundary of the old into a new self by acquiring new knowledge. In the process, new conceptual artifacts and structures for interaction are created, which provide possibilities as well as constrain the entities in consequent knowledge-creation cycles. Consequently, the entities and the environment have reciprocal relationship*" (Giddens, 1984 : p. 89).

a) Knowledge creation and the role of strategy

Andrews (1971) argues that the role of strategy is to adapt the organization to the threats and opportunities in the environment with the given strengths and weaknesses of the organization. An organization needs to choose the environment in which it can build and sustain competitive advantages. The environment can be viewed as a moving target to which the organizations are desperately trying to modify their operations.

Drucker (1993) argues that knowledge is created through the synthesis of the contradictions between the organization's internal resources and the environment. Thus, strategy in a dialectic organization can be conceptualized as a combination of internal resources as well as environmental adjustment. Hence, there is a need for a new theory that focuses on such interactions.

b) Knowledge creation as a synthesizing process

Nonaka and Takeuchi (1995) argue that knowledge is created through interactions between human and social structures. These actions and interactions with the environment create and enlarge knowledge through the conversion process of tacit and explicit knowledge. Moreover, Giddens (1984) argues that people enact their actions with two main levels of consciousness: practical consciousness and discursive

consciousness in daily lives. Discursive consciousness gives rationalizations for actions and refers to more conscious and more explicitly knowledge and practical consciousness, on the other hand, it refers to the level of people's live that they do not really think about. Hence, tacit knowledge is produced by practical consciousness and explicit knowledge is produced by discursive consciousness.

Bhaskar argues that knowledge creation starts with "*Socialization that is the process of converting new tacit knowledge through shared experiences in day-to-day social interaction. Tacit knowledge can be acquired through shared direct experience, for instance, one can share the tacit knowledge of colleagues by empathizing with them through shared experience. Consequently, daily routines are part of tacit knowledge because they are developed in close interaction over time*" (Bhaskar, 1978: p. 19).

In the meantime, one can accumulate the tacit knowledge through his own experience as an individual. Individuals embrace contradictions rather than confront them. This enables actors to absorb knowledge in their social environment through action and perception. Hence, the dichotomy between the environment and the organization can be synthesized in the socialization process as members of the organization accumulate and share the tacit knowledge of the environment through their practical consciousness.

Such tacit knowledge is articulated into explicit knowledge through the process of *Externalization*. Tacit knowledge is made explicit so that it can be shared by others to become the basis of new knowledge such as concepts, images, and written documents. During the externalization stage, individuals use their discursive consciousness and try to rationalize and articulate the world that surrounds them. Dialogue is an effective method to articulate one's tacit knowledge and share the articulated knowledge with others. Through dialogues among individuals, contradictions between one's tacit knowledge and the structure, or contradictions among tacit knowledge of individuals are made explicit and synthesized. To make a hidden concept or mechanism explicit out of accumulated tacit knowledge, abduction or retroduction is effective rather than induction or deduction. The sequential use of metaphor, analogy and model is a basic method in abduction (Lawson, 1998). In

addition to the movement from hidden to the surface, these methods enable actors to create linkages between the surface and deeper domains of social reality. It is crucial here to understand that actors seek to detach themselves from routines by active exposure to a context that enables them to see the inherent contradiction. This property is in contrast with the structuration theory where the two levels of consciousness coexist in harmony and agents find ontological security in routines (Giddens, 1984).

Explicit knowledge is collected from inside or outside the organization and then combined, edited, or processed to form more complex and systematic explicit knowledge through the *Combination* process. The new explicit knowledge is then disseminated among the members of the organization. Creative use of computerized communication networks and large-scale databases can facilitate this mode of knowledge conversion. The combination mode of knowledge conversion can also include the breakdown of concepts. Breaking down a concept, such as a corporate vision, into operationalized business or product concepts also creates systemic, explicit knowledge. Here, contradictions are solved through logic rather than synthesized. Rationalism is an effective method to combine, edit, and break down explicit knowledge (Bhasker, 1978).

Explicit knowledge created and shared throughout an organization is then converted into tacit knowledge by individuals through the *Internalization* process. This stage can be understood, where knowledge is applied and used in practical situations and becomes the base for new routines. Explicit knowledge has to be actualized through action, practice and reflection so that it can really become knowledge of one's own knowledge. For instances, training programs can help trainees to understand an organization and themselves. By reading documents or manuals about their jobs and the organization, and by reflecting upon them, trainees can internalize the explicit knowledge written in such documents to enrich their tacit knowledge base. Explicit knowledge can also be embodied through simulations or experiments. Pragmatism of learning-by-doing is an effective method to test, modify and embody explicit knowledge as one's own tacit knowledge. Internalized knowledge affects the human agency and the structure, as it changes the action of

human agency and how it views the structure. The synthesis of individuals and the environment occurs at this level as well (Nonaka& Takeuchi 1995).

A number of scholars, Badaracco (1991), Wikstrom and Normann, (1994), Nonaka and Takeuchi (1995), Inkpen (1996), explain the nature of the creation of knowledge as the movement through the four modes of knowledge conversion forms a *spiral*, not a circle. In the spiral of knowledge creation, the interaction between tacit and explicit knowledge is amplified through the four modes of knowledge conversion. The spiral becomes larger in scale as it moves up the ontological levels. Knowledge created through the SECI process can trigger a new spiral of knowledge creation, expanding horizontally and vertically as it moves through communities of interaction that transcend sectional, departmental, divisional, and even organizational boundaries. Knowledge can be transferred beyond organizational boundaries, and knowledge from different organizations interacts to create new knowledge.

Through dynamic interaction among individuals, knowledge created by the organization can trigger the mobilization of knowledge held by outside constituents such as educators, communities of practice, universities, or publishers. For example, an innovative new teaching practice may bring about changes in the teaching methodology, which in turn triggers a new round of product and process innovation at the organization. Another example is the articulation of tacit knowledge possessed by individuals that they themselves have not been able to articulate. A new idea works as the trigger to elicit tacit knowledge when individuals give meaning to the outcome by adapting, using, or not ignoring it. It can also trigger the changes of individuals in terms of their worldview and eventually reconstruct the environment. Their actions are then reflected in the innovative process of the organization and start a new spiral of knowledge creation. Organizational knowledge creation is a never-ending process that upgrades itself continuously (Wikstrom and Normann, 1994).

Knowledge creation is a self-transcending process, in which one reaches out beyond the boundaries of one's own existence (Jantsch, 1980). In socialization, self-transcendence is fundamental because tacit knowledge can only be shared through direct experiences, which go beyond individuals. For example, in the socialization

process people empathize with their colleagues, which diminish barriers between individuals. Basically, frequent physical interaction and perception help participants to create shared mental presentations and routines. In externalization, an individual transcends the inner and outer boundaries of the self by committing to the group and becoming one with it. Here, the sum of the individuals' intentions and ideas fuse and become integrated with the group's mental world. This stage is integral because the externalization of knowledge often helps people to see that the same phenomenon can be viewed in many different and contrasting ways. In combination, new knowledge generated through externalization transcends the group to be combined. In internalization, individuals reflect upon themselves by putting themselves in the context of newly acquired knowledge and the environment where the knowledge should be utilized. This again requires self-transcendence.

6.2. Knowledge Management Team

One approach to forming an effective KM team is to define the different types of KM professionals and the types of skills, attributes, and background they should ideally possess. The ultimate goal is to develop a list of cognitive, affective, and psychomotor skills together with the required competency levels for each skill.

TFPL is a specialist recruitment, advisory, training, and research services company with offices in London focusing on knowledge management, library management. Since 1987, TFPL has worked with organizations in both the public and private sectors to help them develop and implement knowledge and information strategies and to recruit and train information and knowledge leaders and their teams. TFPL has drafted a guide of KM skills and competencies to provide a clear and practical overview of KM skills and competencies that draws on the practical experience of organizations in a wide range of sectors and with varying approaches to KM. In general, these KM skills include: (time management, acquiring knowledge, using different learning techniques, effective skills to present existing knowledge and to gather knowledge, informal networking skills to influence people, resource investigation skills, effective IT skills for recording and disseminating information, skills of cooperative problem solving,

open dialogue skills, flexibility and willingness to try new things and take educated risks, active review of learning from mistakes, risks, opportunities, and successes.

The TFPL knowledge management skills map is based on an extensive international research. The project team contacted over five hundred organizations involved in implementing KM and identified the roles that they had created, the skills that were needed in those roles, and the additional skills that were required across the organization. These key skills included an understanding of the KM concept-the philosophy and theory, an awareness of the experience of other organizations in developing KM solutions and approaches; an understanding of and the ability to identify the business value of KM activities to the organization and an appreciation of the range of activities, initiatives, and labels employed to create an environment to create, share, and use knowledge to increase competitive advantage and customer satisfaction.

The KM team's skill requirements can be built up from the set of critical skills or core competencies, such as an ability to learn, autonomous, wait to be told, collaborative team player, sees the big picture, makes connections, learns from mistakes, ability to think and do, with a focus on outcome and an appreciation of information management techniques.

A KM dream team would collectively possess the skills of communication, leadership, expertise in KM methodology/processes/tools, negotiation, and strategic planning. It would also know the organization, remain connected to the top, adopt a systems view, and be an intuitive risk taker.

TFPL has developed a competency framework that allows managers in consultation with the staff who will hold the posts to define knowledge and information management roles and their competencies. The KM Skills Toolkit (http://www.tfpl.com/skills_development/skills_toolkit.cfm) is a diagnostic tool that can help organizations to assess recruitment needs and develop job descriptions and personnel specifications for knowledge and information roles.

Moving up one level, Goad (2002) groups key KM skills along the following seven categories:

1. Retrieving information: The skill of retrieving information is everything from the low-tech skills of asking questions and listening, and following up to the more complex skills of searching for information using internet search engines, electronic library databases, and relational databases. Concepts of widening and narrowing one's search, Boolean logic, and iterative search practices are an important part of the effective exercise of this skill.
2. Evaluating/assessing information: Evaluating information entails not only being able to judge the quality of information, but to determine its relevance to some question or problem at hand. Though this has no necessary computer mechanism for implementation (though Internet search engines have crude relevant raters), the greater availability of information in the current information-rich environments makes this skill of far greater importance.
3. Organizing information: Organizing information entails using various tools to draw connections between items of information. In the manual environment, we use file folders, drawers, and other mechanism for organizing information; in more high-tech environments, we use electronic folders, relational databases, and web pages. Effective organizational principles must underlie effective implementation of information organization regardless of the environment .
4. Analyzing information: Analyzing information entails the challenge of tweaking meaning out of data. Integral to analyzing information is the development and application of models, often quantitative, to "educate" relationships out of the data. Tools such as electronic spreadsheets and statistical software provide the means to analyze information. But the human element is central in framing the models that are embodied in that software.
5. Presenting information: The key aspect of presenting information is the centrality of audience. Presenting information-whether through PowerPoint presentation, web site, or text-builds on principles of chunking information to enable audiences to understand, remember, and

connect. Web styles and monographs on designing web site usability provide concrete content for this KM skill.

6. Securing information: While securing information differs from the other six KM skills, it is no less important. Securing information entails developing and implementing practices that ensure the confidentiality, quality, and actual existence of information. Practices of password management, backup, archiving, and use of encryption are important elements of this effectively practiced KM skill.
7. Collaborating around information: Increasingly, information technology tools called groupware are being provided to support collaborative work. To use that technology effectively requires not just understanding how to use those tools but understanding underlying principles of effective collaborative work. Principles of e-mail etiquette are an illustration of important knowledge underlying the effective exercise of this KM skill.

Most organizations are still defining their KM roles. Some are repurposing or extending existing roles in order to better accommodate knowledge work. While KM in every organization is unique and necessarily tailor-made, there are a number of "generic" KM roles that can be identified. These are discussed in further detail below.

6.3. Major Categories of KM Roles

Hislop (2011) identified a number of KM roles which are quite diverse. They include such categories as:

- a) Strategic roles Chief human capital officer, human capital retention manager;
- b) Senior and middle management roles Chief knowledge officer, knowledge manager;
- c) Knowledge leaders Also referred to as KM champions, who are responsible for promoting KM within the organization;
- d) Knowledge managers Responsible for the acquisition and management of internal and external knowledge;

- e) Knowledge navigators Responsible for knowing where knowledge can be located, also called knowledge brokers;
- f) Knowledge synthesizers Responsible for facilitating the recording of significant knowledge to organizational memory, also called knowledge stewards;
- g) Content editors Responsible for codifying and structuring content, also called content managers; roles involving capturing and documenting knowledge-researchers, writers, editors;
- h) Web developers Electronic publishers, intranet managers, content managers;
- i) Learning-oriented roles Such as trainers, facilitators, mentors, coaches-including those with responsibility for developing information and knowledge skills;
- j) Human resources roles Specific responsibility for developing programs and processes that encourage knowledge-oriented cultures and behaviors;
- k) Knowledge publishers Responsible for internal publishing functions, usually on an intranet, also called webmasters, knowledge architects, knowledge editors;
- l) Coaches and mentors Responsible for assisting individuals throughout the business unit or practice to develop and learn KM activities and disciplines;
- m) Help desk activities Delivery of KM and information related to training, also called KSO (knowledge support office).

In seeking to recruit relevant professionals for knowledge management raise, a key challenge lies in defining the objectives and deliverables of those roles and in specifying the skills and experience of the people needed to fill them. Some of these roles may be newly created, while others may involve redefining or extending existing roles.

Different organizations will necessarily have different approaches describing knowledge management roles. A sample KM job description may look something like the example given here.

KM professionals require a multidisciplinary skill set that consists of such competencies as finding, appraising, and using knowledge, reformulating questions, navigating content, evaluating the relevance of content, filtering out what *is* not needed, and synthesizing from diverse sources to apply the knowledge (e.g., to

make a decision). Last but not least, they must contribute to recording such valuable experiences to organizational memory systems.

6.4. Senior Management Roles

One may be familiar with the role of a chief executive officer (CEO), chief operating officer (COO), and the chief financial officer (CFO). There are also chief technology officers (CTO) and chief information officers (CIO), positions typically reserved for heads of information technology. An analogous role exists for a knowledge management executive, sometimes referred to as the chief knowledge officer (CKO) or chief learning officer (CLO). The CKO or CLO position heads the KM team and is primarily responsible for:

- Knowledge management strategy
- Knowledge management operations
- Influencing change in the organization
- Managing knowledge management staff (Rusonow 2003)

The KM executive must decide how information is evaluated, created, processed, inventoried, retrieved, and archived, so that KM activities are aligned with the business goals of the organization. There are huge ramifications when an organization creates records, installs a new online catalog or a firewall, designs a web site, creates virtual workplaces, copyrights information, and creates policies and procedures on how one department communicates information to another (or too many times, there is no communication between departments). The head of KM must be present in all these events. This executive KM role often also incorporates change management.

Thurow (2004) maintains that in people's increasingly knowledge-based economy, every company will eventually have a senior manager responsible for KM. Those that get there first will have a competitive edge. Just what this person will do is still being invented and will differ from industry to industry. The KM executive's duties may be as varied as recommending whether a company should buy, sell, or make its technologies, or determining where technology is going and where new competitors may arise. KM executives identify critical knowledge

needs within a company as well as any knowledge gaps that need to be addressed. KM executives need to be good relationship builders as the fundamental issues revolve around people, culture, roles, behaviors, and the business processes in the organization.

Skyrme defines a CKO as *"a senior executive who is responsible for ensuring that an organization maximizes the value it achieves through one of its most important assets-knowledge."* (Skyrme, 1997: p. 33) Although only a few companies have people with this explicit title, those with similar responsibilities include Director of Intellectual Capital and Director of Innovation. CKOs will typically contribute to the following KM goals:

- Maximize the returns on KM investment in knowledge-people, processes, and intellectual capital;
- Exploit intangible assets, for example, know-how, patents, customer relationships;
- Repeat successes and share best practices;
- Improve innovation and the commercialization of ideas;
- Avoid knowledge loss and leakage after organizational restructuring.

The responsibilities associated with the job function of KM executive revolve around converting the KM strategy into specific KM initiatives that help achieve organizational business goals. KM initiatives fall into general categories such as:

- Promoting the importance of knowledge sharing;
- Creating a technical infrastructure to ease that sharing;
- Promoting a cultural climate that rewards knowledge sharing behaviors;
- Measuring the value to the organization of knowledge and KM practices.

Potentially the most important part of the job function is promoting a corporate culture that encourages knowledge sharing, a long-term proposition. The CKO works as a change agent to build a cultural climate that rewards sharing behavior (Earl and Scott 1999). Because of the power associated with

expertise, employees may be reluctant to share their knowledge and skill. Gordon argues that "*the old adage that knowledge equals power may prevail as employees with specialized knowledge may elect to use this as a source of personal power*" (Gordon, 2002: p. 81).

The CKO argues against perceived reasons for hoarding knowledge, (Stewart 1998) persuades workers that knowledge-sharing initiatives are to their benefit (Earl and Scott 1999), and uses motivational techniques to reward a sharing climate. The CKO also creates an environment that makes it easier to build communication networks between employees who do not normally work together but would generate value from exchanging information (Earl and Scott 1999). Stewart contends that "*the CKO works with formal and informal communication networks and supports communities of practice or groups of experts who could learn from knowledge exchange*" (Stewart 1998 ; p. 78).

Davenport and Prusak (1997) argue that these organizational changes will necessarily require changes to the information technology structure, since IT is the key enabler in leveraging intellectual capital. Having fostered a sharing culture, the CKO uses IT to create a structured means of knowledge exchange and as a way of generating opportunities to connect workers together across organizational units and geographies. The CKO designs ways for workers to present and receive knowledge and is responsible for developing and maintaining an information infrastructure to harness the collective knowledge of the organization.

While working to foster a cooperative culture and creating mechanisms to exchange knowledge, the CKO keeps a sharp eye on the rewards of these endeavors. The results of KM activities must translate into real business value. In business ventures, the bottom line is the measure of success to an organization. The CKO evaluates the return on investment before making cultural and design decisions and proceeding with KM initiatives. A final function for many CKOs is that of manager to a team of knowledge professionals. Although not all CKOs have a team, Earl and Scott (1999) found that most have a small staff of three to twelve specialists working under their supervision. In addition to leading the management of intellectual capital in an organization, the CKO must therefore also supervise the work and careers of their employees.

Some KM executives have the title of Chief Learning Officer (CLO). There is a journal dedicated to this new role, called chief learning officer. Like CKOs, most chief learning officers are first-generation incumbents. They typically started their jobs less than three years ago and did so without clearly defined roles, responsibilities, or daily activities. Chief knowledge officer positions are typically created to leverage knowledge into tangible business benefits. Likewise, CLO positions are designed to leverage learning through the culture of an organization, the type of knowledge and learning it wants to emphasize, and how technologically focused it is. Unlike CKOs, the roots for most chief learning officer positions are in human resources, organization development, or sales and marketing (Bonner, 2000). Most incumbent CLOs have strong backgrounds in learning strategies and a strong orientation toward setting and reaching business goals. They have been selected from such positions as director of training or vice president of sales and marketing. CLOs are committed to the strategic integration of organizational and individual learning at all levels and across all functional silos. They often have as a primary objective to change their organizations' mind-sets from training (usually defined as a classroom-based delivery system) to continuous learning and human performance improvement and to use a wider variety of delivery methods such as virtual learning options, corporate universities, and self-directed learning.

Chief Learning officers are not glorified training directors. Beard (2002) points out that the CLO role began as being primarily concerned with organizational learning and initiatives such as e-learning, but the role has expanded to help transform the organization into a learning organization. The primary success factor for being a CLO is being a businessperson first and understanding how to drive through a strategic initiative. CLOs must be able to communicate in business-tangible results, think strategically, and talk the language of other executives. CLOs are strategic leaders who help senior management translate learning into strategic business capabilities

Willis and May (2000) describe the CLO role as:

- 1) A strategic, lead player in today's business organization;

- 2) Responsible for making sure learning across an entire system is leveraged, not sacrificed;
- 3) Accountable to the whole system and must have broad discretionary power;
- 4) Operates by using knowledge about how adults learn, how learning affects work, how value systems operate, and how social and technical systems in an enterprise or in their environment may either support or counteract each other.

CLOs work with the know-how of knowledge-the tacit knowledge that is hard to codify. They integrate thinking and acting and their work involves lots of errors and mistakes. CLOs need to create an environment that fosters knowledge sharing informally so that they can interact with a team in a work context. The CLO's work begins and ends with the customer. Their work is applicable at each point in the continuous cycle that becomes spirals of need and need satisfaction. Learners validate and confirm the mission of the educational organization, which in turn drives the business strategy. Strategy involves inventing and choosing options, determines the culture needed to accomplish the strategy, and leads to modification of the systems in use to create competitive advantage. If there is advantage to the learners, they are satisfied and the mission of the company is once again ratified. Some typical CLO initiatives would include:

- *Cultural transformation* assisting with the development and communication of a new vision and strategy for the organization and tending to the cultural transformation to support the new corporate direction. Watkins and Marsick (1993) noted that training programs can help deliver skills needed for organizations to change, but do not address the deep-seated, mental models and attitudes or the organizational structures and norms which perpetuate them.
- *Culture maintenance* Designed to support the marketplace strategy and address deficiencies in skills essential to maintain the new culture developed.

- *Contemporary initiatives* Related to business development, like developing a new marketing plan, account manager development, or promotional process redesign. These require in-depth experience in the industry, comfort/ease in working across all functions of the organization, and a whole systems viewpoint/thinking.

Due to the nature of the work, CLOS have a limited number of quantitative performance indicators and most are budget related. The CLO's job focuses mainly on management of projects, preparing plan documents for projects including problem or opportunity synopsis, proposed solutions, action steps and timetable, deliverables, and projected costs. A CLO's performance is evaluated in terms of meeting objectives on target, on time and on budget. The CLO is an unprecedented kind of catalyst in organizations, serving to combine technical and social work factors through communication and paving the way for employees to contribute their very best to the collective enterprise.

KM executives, whether they have a CKO or CLO title, are primarily responsible for ensuring that KM goals are in line with organizational strategies and objectives.

7. Knowledge Management in Organizations

Alavi and Leidner (2001) argue that the framework of knowledge management is based on the view of organizations as knowledge systems that include four knowledge processes: creation, storage and retrieval, transfer, and application. The knowledge-based perspective postulates that organizations existence facilitates the generation, transformation and the application of knowledge through implementation in organizational setting. Hence, organizations can be viewed as systems created for creating, storing and retrieving, transferring and sharing, and applying the knowledge required for development and delivery of organizational practice products and/or services.

Nonaka (1994) Nonaka and Nishiguchi (2001) identify two approaches of knowledge creation referring to new organizational *know-how* and *capability*. These two approaches to organizational knowledge creation are: (1) generating new knowledge inside the organization and (2) acquiring new knowledge from external

sources. Individuals create knowledge through cognitive processes such as reflection and learning. Groups create knowledge through collaborative interactions and joint problem solving activities. Information technology (IT) can facilitate the creation process through its support of the individual's access to existing knowledge. Huber argues that "*knowledge creation can be an activity that occurs inside the organization to create new knowledge, meanwhile knowledge acquisition is focused on assimilating existing knowledge from outside the organization.*" (Huber, 1991: p 65)

Walsh and Ungson (1991) identify different types of knowledge, namely *storage* and *retrieval*. They refer to the development of organizational memory. Internal memory refers to the stocks of knowledge that reside within the individuals in an organization. Internal organizational memory consists of individuals' skills as well as the organizational culture. On the other hand, external memories contain codified and explicit organizational knowledge. The development of external memory in organizations involves three key activities: (1) determining the content of the memory; (2) determining the sources of the content and specifying the means of collecting the targeted knowledge; and (3) developing the content of the external memory and specifying the means of accessing its content.

Ko, Kirsch, and King (2005) define knowledge transfer as the communication of knowledge from a source so that it is learned and applied by a recipient. The knowledge transfer process involves the transmission of knowledge from the initial location to where it is needed and is applied.

Huber (1991) believes that usually organizations do not know what they know, and often possess weak systems for locating and transmitting different forms of knowledge within their various locations. Argote and Ingram agree that "*the lack of ability to transfer existing knowledge to the point of application is a key detriment to organizations' realization of the full value of their knowledge assets*" (Argote and Ingram, 2000 : p. 57).

On the other hand, Renzl (2008) considers knowledge sharing as more concerned with the collective character of knowledge emerging from interaction and dialogue among individuals. King (2000) differentiates the two exercises that knowledge transfer involves purposeful communication of knowledge in a known

dyad, knowledge sharing is focused on dissemination, while knowledge sharing is less focused in dissemination, it is involving repositories or unknown recipients.

The aforementioned knowledge exchange modes of knowledge in organizations are: (1) exchange knowledge between individuals; (2) exchange between individuals and knowledge repositories; and (3) exchange among existing knowledge repositories. The three terms of knowledge transfer or sharing indicate knowledge exchange.

Knowledge application refers to the use of knowledge for daily activities such as decision making, problem solving, and coordination by individuals and groups in organizations. Knowledge in and of itself does not produce organizational value, but its application for taking effective action does give it a value. Gioia and Pool (1984) draw our attention that individual cognition and knowledge structures in organizational settings enact cognitive processes, for example problem solving and decision making, with little attention and by invoking only pre-existing knowledge and cognitive routines. While this tendency leads to a reduction in cognitive load and is therefore an effective strategy for dealing with individual cognitive limitations. It also creates a barrier to the search for and application of new knowledge in organizations. Consequently, IT tools that facilitate knowledge application can potentially lead to significant organizational value. A platform for enhancing organizational knowledge management by providing support of the timing, scope, depth, dynamics, and efficiency of the underlying knowledge management processes can provide a complement to the process on knowledge management.

a) Knowledge Structure

Knowledge management is considered to a set of management activities aimed at designing and influencing processes of knowledge creation and integration including processes of sharing knowledge. Knowledge management ~~would thus~~ seems to be one of those areas where managerial practice and the academic literature develop simultaneously and perhaps even co-evolve. Knowledge management is not much different from many other management activities that promise to contribute to competitive advantage. Knowledge management philosophy is made of ideas from organizational behavior to notions from information science, where organizational

economics plays a limited role in the empirical literature on knowledge management. However, the knowledge management literature neglects organizational economics at its peril (Ambos and Mahnke, 2010).

Foss (2007) argues that organizational economics looks inside the firm by examining the tasks of motivating and coordinating human activity to explain the nature of efficient organizational arrangements and the determinants of such arrangements. Efficiency is understood in the sense of maximizing the joint surplus from productive activities, including processes of creating, sharing and exploiting knowledge. It is argued that the costs and the benefits of productive activities-and therefore joint surplus-are influenced by the incentives, property rights and ways of disseminating and processing information that structure productive activities. Hence, the treatment of cost for searching for knowledge is considered as one category among a multitude of relevant costs of knowledge management.

For better understanding, individuals need to focus on *coordination* and *incentive* problems that processes of creating, sharing, and exploiting knowledge inside firms may give rise to, and how various aspects of governance may be understood as a response to such problems. Easterby-Srnith et al., (2000) argue that steps need to be taken towards meeting the challenges in the recent observation that the time is ripe to start addressing learning and knowing in the light of inherent conflicts between shareholders' goals, economic pressure, institutionalized professional interest and political agendas.

b) Organizational Economics

Organizational economics theory has directed attention to the *coordination* and *incentive* problems that are caused by the pathologies that accompany an internal division of labor, such as asymmetric information, diluted performance incentives, measurement difficulties, bargaining problems, moral hazard, duplicative (redundant) efforts, etc. In turn, organizational economists have explained how a host of organizational arrangements, such as various kinds of authority, payment schemes, delegation of decision rights, etc. serve to alleviate the severity of such problems.

Organizational economics theory perspectives have predominantly addressed issues related to payment schemes delegation of decision rights, multitasking and managerial commitment (Baker et al., 1999) under assumptions of moral hazard and asymmetric information. Transaction cost economics (Williamson, 1996) and property rights insights (Hart, 1995) have been brought to bear on issues related to allocation of rights and design of contracts when investments in human capital are firm-specific, agents may behave in an opportunistic manner, and contracts are incomplete. Carter addressed *the optimal design of organizational structures, given the bounded rationality of individuals, he emphasized the work on complementarities between organizational elements lends strong formal support to the traditional notion that there are stable, discrete governance structures that combine organizational elements in predictable ways* (Carter, 1995: p. 119).

There are a number of threads in the organizational economics (Foss, 2000). On methodology level, organizational economics is unabashedly 'individualistic in the sense that all organizational phenomena should be explained as the outcome of the choice behavior of individual agents. At the theoretical base, the whole literature is concerned with 'efficiency,' that is to say, how resources are allocated so that they yield the maximum possible value. First, the organizational economics perspective is maximizing the value that can be created *economic efficiency*. Second, the efficiency perspective allows one to discriminate between alternative forms of economic organization in terms of efficiency. Efficiency will allow individuals to choose those organizational forms, contracts, and governance structures that maximize their joint surplus and will find ways to split this surplus among them .

In turn, the influence of alternative organizational arrangements on value creation may be analyzed in terms of motivation, knowledge, information, and complementarity and how alternative arrangements embody different ways of influencing these variables. These are all in different ways related to those 'transaction costs' that are central in organizational economics theories, and the size of which influences the value that may be created from organizing and governing scarce resources in particular ways. The value that can be created, in the presence of transaction costs, falls short of what may be created in a world with no problems of motivation, knowledge, information, and complementarity. There are other factors

such as motivation, knowledge and information and the coordination of complementary actions that can be manipulated to organizational economics.

c) Motivation

The motivational assumptions of organizational have been critical of the seemingly cynical assumptions with respect to human nature that drive much of organizational economics analysis. For instance, Williamson, (1996) argues that both opportunism and moral hazard, that is, using asymmetric information to one's advantage, are not descriptively accurate. Motivational assumptions serve to high-light the-presumably undisputed-fact that actors often have very different interests; opportunism and similar assumptions are stark ways of highlighting such. The motivational assumptions, in addition, serve to emphasize that economic organizations need to be designed with an eye to the possibility that some actors may act in a morally hazardous-or opportunistic manner.

In the context of internal organization, the largest effort is the efficient responses to various principal-agent problems. In particular, Milgrom *"draw our attention to be paid to differences between input and output-based payment, and how the choice between these is determined by the observability of effort and states of nature; the role of monitoring and of subjective and objective performance measurement; and of how a hierarchical structure may constrain 'rent-seeking,' that is, attempt to influence superiors to one's own advantage"* (Milgrom, 1988: p. 94).

The possession of specialized knowledge is a strong support to the organizational economics. Hart (1995) believes that employees cannot expect to capture all or even most of the quasi-rent from their specialized human capital investments, which harms incentives to undertake the investments. Kreps (1990) believes on other hand that strong and credible managerial commitment to not using the hold-up option may solve the problem. Furthermore, employees need to be given more authority to decision rights to undertake human capital investments.

These incentive problems are relevant to the understanding of the costs of knowledge management practices. Human capital investments consist in the gathering and building-up of specialized knowledge and skills in which they are not likely to be willing to share the relevant knowledge and skills with other agents,

unless they are properly compensated. It is often difficult to contract over knowledge and skills and to enforce contracts on the sharing of the knowledge and the compensation to the employees between those employees who possess important specialized knowledge and the firm. Two implications of direct relevance for knowledge management are to be considered: first, forced knowledge management initiatives is experienced as hold-ups by those agents inside the firm who control specialized knowledge and skills; Second, the best way to encourage human capital to share knowledge is by giving the relevant employees appropriate incentives or even making them partners through providing 'ownership rights.

d) Asymmetric Knowledge and Information

Even if individuals can be motivated to share knowledge *incentive-compatible*, there is still no grantee that they will make optimal choices. Willingness the same as ability. They are not likely to have all the information needed for making an optimal choice prohibitively costly. It is a matter of the subjective and tacit character of knowledge. As Hayek believed that "*the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem of how to allocate 'given' resources-if 'given' is taken to mean given to a single mind which deliberately solves the problem set by these 'data'. It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. ... it is a problem of the utilization of knowledge which is not given to anyone in its totality*" (Hayek, 1945 : p. 16).

Of course, one can recognize that organizations face such a problem of dispersed knowledge to a smaller extent than societies do. ; however, it is still relevant to them. Jensen and Meckling (1992) think that organizations may cope with the problem, for example they may delegate decision rights so that these rights are co-aligned with those who possess the relevant knowledge, balancing the attendant benefits with the agency costs that are caused by delegation. However, knowledge sharing is a preferable alternative. Rather than delegating decision rights

in order to better utilize local knowledge, the existing rights structure remains unchanged and the relevant knowledge is gathered and shared among those who can make profitable use of knowledge. Knowledge sharing mechanism is a key factor of knowledge management.

Knowledge sharing may impose costs on an organization than the alternative of delegating decision rights. Knowledge sharing that takes place within an existing organizational structure is likely to impose higher costs of communicating, storing, and retrieving knowledge. The point is that knowledge sharing may introduce costs that are caused by the bounded rationality of individuals and their limited ability to identify, absorb, process, remember knowledge. The bottom line is that a full assessment of what alternative is most suitable in a specific situation has to be balanced.

e) Knowledge Creation

Nonaka and von Krogh (2009) argue that knowledge creation in organizations lies at the heart of competitive advantage. Expressions such as *organizations learn* and *organizations know* have become commonplace in much of the strategy of knowledge management. Organizational knowledge is composed of knowledge sets controlled by individuals. Organizational economics highlights questions that are neglected in the knowledge management literature. The organizational economics perspective directs attention to the possible incentive conflicts that may arise in connection with issues such as "*How can employees be induced to making organization-specific human capital investments?*" and "*How can organizations enable knowledge creation in teams?*" (Nonaka and von Krogh, 2009 : p. 76). Holmstrom (1989) believes that these questions are central to successful knowledge management in practice and they are prone to an organizational economics treatment. This is because processes of creating knowledge are risky, unpredictable, labor intensive, idiosyncratic, and often require substantial human capital investments. Thus, the problems of motivating employees and capturing new knowledge are two sides of the same coin.

Many of knowledge management studies recommend the use of teams in the form of work groups, inter-disciplinary, and cross-functional teams to foster knowledge creation (Meyer and deTore, 1999; von Krogh et al, 2000). Teamwork may bring knowledge together that hitherto existed separately, resulting in 'new

combinations' (Schumpeter, 1950); it may facilitate cross-functional communication, cross-fertilization of ideas, and enhance worker involvement. Nonaka and Takeuchi, (1995) argue that through the integration of knowledge of individual members, teams may not only blend knowledge and insights beyond what individual members may achieve, but the development of new knowledge may also be stimulated by conversations and language-based learning in teams. Scott and Einstein (2001) believe that knowledge creation in teams has its virtues, there are special difficulties associated with aligning interests of team members. Not only will teams be particularly prone to moral hazard, notably in the form of shirking, but the right form of incentive may also be contingent on the type of team at hand. Questions arise that remain neglected in the knowledge management literature such as: Who should be rewarded-teams or individuals? Who should evaluate contributions of team members-other team members, a specialized monitor, or an external manager? What measures of performance should be used and when? An organizational economics perspective suggests that the success of teams' knowledge-creating efforts depend, inter alia, on (1) the size of the team, (2) trade-offs between individual and team incentives, (3) exclusion rules, and (4) matching the varying degrees of uncertainty to incentive design.⁶

f) Integrating knowledge

Demsetz (1988) argues that organizational economic insights have substantially fertilized the literature on knowledge in organizations that characterizes the organization as a knowledge-integrating institution. Specialization of tasks leads to focused learning in narrowly defined domains (Smith, 1978). However, because the division of tasks also leads to the division of knowledge, knowledge integration may be required when several activities are interdependent and individuals need to adapt their action to each other (Thompson, 1967). If individuals are specialized in different knowledge domains this will limit the rate at which knowledge that lies outside a narrow specialization can be assimilated, accumulated, and applied (Simon, 1991; Lane and Lubatkin, 1998). Three coordination mechanisms may be conducive to address such knowledge-integration problems-direction, common knowledge, and autonomous adaptation-but their efficacy may vary with varying task dependencies at hand.

As Hayek (1945) argues that markets make individuals create knowledge intuitively, this activity facilitates the communication among individuals to coordinate their tasks and action. Its applicability may also be limited to situations where task coordination is signified by low uncertainty and low interdependence between tasks that make autonomous adaptation possible (Grandori, 2001). Moreover, pricing knowledge in exchange faces a fundamental paradox: the value of knowledge to a purchaser is not known until after the knowledge is revealed; however, once revealed, the purchaser has no need to pay for it (Arrow, 1984). Second, Arrow also argues that 'authority, the centralization of decision-making, serves to economize on the transmission and handling of knowledge' (Arrow, 1974). Demsetz (1988) agrees when he suggests that 'direction substitutes for education.

8. Implications of Knowledge Managements Approaches in Education

Knowledge management is upgrading the organization's abilities and reflect its knowledge in performance. Moreover, through knowledge management, the institutionalized knowledge is reserved and not lost by employees turnover. The status of knowledge management in organizations reveals that they do not value knowledge creation, easily lose the knowledge they already own, forbid knowledge sharing, and do not invest in knowledge. And most important, because of lack of proper knowledge organizing, they are not aware of what they already know.

Consequently, knowledge is a living value, its dynamic and smooth flow of specialized experiences and insights makes it essential to the development of the organization. Usually, knowledge is hidden in documents, reports, files, procedures, norms and values. Employees need to grasp the hidden organizational knowledge to achieve better competitive advantage. Organizational leadership should understand that knowledge is a human capacity. What exists in files, documents is not by itself knowledge. Knowledge creation needs efforts from the teamwork through proper organizing. It should be noted that this knowledge is useless unless applied by the teamwork of the organization. It is the duty of the organizational teamwork to organize, share, apply and convert information into organizational knowledge. Drucker (1999) insisted on the idea that explicit information and knowledge as a resource for organization, which is the cultural dimension of knowledge management".

The aforementioned arguments emphasize that the different kinds of knowledge: tacit knowledge and explicit knowledge. Tacit knowledge consists of one's mental models, beliefs and opinions, and is rare, irreplaceable, inimitable, and precious. Knowledge sharing changes tacit knowledge to explicit knowledge. Explicit knowledge is a kind of knowledge which can be defined and shared easily through information technology.

Based on the definitions of knowledge management, the researcher considers that KM is a method, a tool and technique by which knowledge can be created and shared. Profitability and productivity of knowledge is achieved through sharing knowledge with to acquire the ability for gaining competitive advantage. Hence, knowledge management in educational organizations is every activity of knowledge creating, sharing, and applying for the purpose of better learning and improved performance. It is in the form of a four processes: effective learning process blended in creation, organizing, sharing and applying knowledge, which leads to upgrade of organizational intellectual capitals and performance improvement.

Concerning the importance of knowledge management and its benefits and advantages in the educational organizations, this research is centered on the survey of knowledge management approaches, then suggestions are based on gained best practices in the field of KM presented in order for improvements. Furthermore the model to be applied in this research can be used as a framework for knowledge management implementation in educational organizations.

As this research helps to know more about the knowledge management approaches, and other knowledge management related topics, so it has cognitive functions. This research can be used for introducing knowledge management approaches, its benefits in other fields.

9. Conclusion

Finally, there are a number of fundamental reasons to justify the role of knowledge management as an enabler of the KM creation. For example, we have seen that information systems are essential for the storage and retrieval of information and knowledge. Also, we have seen the impacts of IT in globalization in overcoming the barriers of distance and time which affect some knowledge workers,

enabling collaborative teamwork, knowledge sharing and integration. It was clearly stated that KM include business intelligence, collaboration, distributed learning, knowledge discovery, knowledge mapping, opportunity generation, and security. IT presented in this chapter as tools that may be applied to support various organizational KM processes, including (i) e-learning and collaboration support systems for the creation process, (ii) data warehousing, data mining and repositories for the process of storage and retrieval, (iii) communication support systems and enterprise information portals for the transferring process, and (iv) expert and decisions systems for the process of applying knowledge.

We noticed that there are differences in the KM models and these differences come from researchers' background and interests. Hence, none of the models can provide a complete and generalized frame for knowledge management by defining fundamental attributes of knowledge management and their interrelationships.

The knowledge worker's job is described as to focus mainly on management of projects, preparing plan documents for projects including problem or opportunity, proposed solutions, action steps and timetable, deliverables, and projected costs. The evaluation was identified in terms of meeting objectives on target, on time and on budget.

The chapter concludes with the discussion of organizational economics perspective directs attention to the possible incentive conflicts that may arise in connection with issues such as how employees can be induced to making organization-specific human capital investments and how organizations can enable knowledge creation in teams. These processes of creating knowledge are risky, unpredictable, labor intensive, idiosyncratic, and often require substantial human capital investments. Thus, the problems of motivating employees and capturing new knowledge are essential for the successful implementation of KM.

After coming across different issues related to knowledge management theoretical and operational literature, the researcher will present in the next chapter the organizational learning as building blocks supportive learning where KM approaches to be applied to enhance learning strategies. Moreover, learning theories to describe

the process of learning. Creativity as a motive of productivity and creating new knowledge.

Chapter III

Organizational Learning

1. Introduction

This chapter introduces the concept of organizational learning as building blocks supportive learning environment, concrete learning processes and practices and leadership that reinforces learning. It will indicate that most schools and teachers cannot produce the kind of learning demanded by the new reforms because they do not know how and the systems they work in do not support their efforts to do so. Organizational learning emphasizes the idea of the product of organizational inquiry that whenever expected outcome differs from actual outcome, an individual (or group) will engage in inquiry to understand and solve this inconsistency. It will introduce the different types of learning in educational organization.

The researcher will present learning theories as defined as a process of bringing together personal and environmental experiences and influences for acquiring, enriching or modifying one's knowledge, skills, values, attitudes, behavior and world views. Learning theories develop hypotheses that describe how this process takes place. The major concepts and theories of learning include behaviorist theories, cognitive psychology, constructivism, social constructivism, experiential learning, multiple intelligence, and situated learning theory and community of practice (behaviorism theory, cognitive theory, constructivism theory, social learning theory). In the meantime, blended learning will be presented as a learning theory that encourages blended learning students to have a personalized learning experience. According to some researchers blended learning may increase the flexibility and individualization of student learning experiences, and also allows teachers to expand the time they spend as facilitators of learning. A number of models to be introduced such as (face-to-face driver model, rotation model, flex model, online lab model, self-blend model, online driver model).

After that the researcher will present the definition of as creativity the ability to produce a novel and an appropriate work which requires an understanding of the meaning of creativity for education and its implication. Yet creativity faces difficulties in the field of education because some teachers do not explain its meaning

which might result in erroneous assumptions. Although teachers feel the pressure to achieve standards, tasks, duties and demands already assigned by policymakers, yet they are asked to be creative and innovative. Implementing creativity in education is challenging because the control over teachers' pedagogies and learners' performances is higher than a creative environment could withstand. Creativity needs time, interaction, and risk-taking such behaviors are attitudes that go against traditional school principles. Creativity requires uniqueness.

As this chapter deals with teaching pedagogies and tasks and duties required from teachers, one important issue to considered 'learning styles theory'. The learning styles theory implies that how much individuals learn has more to do with whether the educational experience is geared toward their particular style of learning than whether or not they are "smart." Hence, educators should not ask, "Is this student smart?" but rather "How is this student smart?" Finally, the researcher will present the impact of learning theories on learning through curriculum, instruction and assessment.

2. Organizational Learning and Knowledge Management

March and Simon (1958) introduced the term *organizational learning*. Later, it became popular as students and colleagues of March and Simon plunged into the study of knowledge management. Levinthal and March further explain the status of KM in organizational learning '*much of the work focused on information search, acquisition, integration, and assimilation in organizations. Knowledge including prior experiences, is viewed as a resource for organizations that could help organizations learn and develop*' (Levinthal and March, 1993 : p. 147). The rational beyond this activity is to understand how information processing or sense-making cycles that people engage in when they learn (Huber, 1991). For example, *absorptive capacity* refers to an individual's or organization's capacity to recognize the value of new kinds of information absorbing it into existing habits of minds or ways of organizing (Cohen and Levinthal, 1990). This is the cognitive perspective on organizational learning that has aimed to understand how people think about complex problems.

In contrast to the cognitive perspective on organizational learning, sociocultural learning theory focuses on individuals' social interactions within

organizations. People learn primarily through the socially embedded activities, behaviors and practices that they engage in (Honig, 2008). Hence, rather than to study how people cognitively do or do not process information effectively, scholars in this approach focus on how social practices shape individuals' learning. For example, researchers study how people or organizations assist others in learning and how communities of practice or learning communities emerge and evolve (Stein & Coburn, 2008). Overall, the emphasis is on the social processes of learning in organizations.

Garvin *et al.* suggest that in order to understand organizational learning, people need to consider several "*building blocks: (i) a supportive learning environment; (ii) concrete learning processes and practices; and (iii) leadership that reinforces learning*" (Garvin *et al.*, 2008: p. 64). Moreover, recent research on teacher learning communities stresses the interdependence of teacher's work and the importance of school culture to adult and student learning (McLaughlin & Talbert, 2006).

Experimentation is a second dimension of the Garvin *et al.* (2008) model. This element is part of *learning processes and practices* that aligns with the cognitive perspective of organizational learning. Recently educational studies investigate processes for the collection, creation, analysis, transfer, and application of knowledge in schools including recent research on the social networks that enable innovation in schools.

Organizational Learning Mechanisms (OLM) examine in-depth how information is acquired, analyzed, disseminated, stored, retrieved, and then "put to use" by teachers. In particular, the final item "put to use," includes an assessment of how teachers change the curriculum based upon feedback they receive (Schechter, 2008,). Adding the element of experimentation in schools would extend the understanding of the context of organizational learning to capture teacher perceptions.

In the meantime, identifying effective OLM require teachers to use information to improve performance. That is, schools must strengthen their internal capacity to manage change processes in order to reach high levels of performance. As Cohen (1990) observed, that most schools offer teachers little room for learning,

and little help in managing the problems that learning would provide, explained that *"it is now clear that most schools and teachers cannot produce the kind of learning demanded by the new reforms – not because they do not want to, but because they do not know how, and the systems they work in do not support their efforts to do so"* (Cohen, 1990: p. 151).

Understanding how to create school systems that can make school themselves be “learning organizations” to improve instruction and enhance student achievement has remained an elusive phenomenon. The reviews of organizational learning (OL) theory continue, and the application of these theories to improve our understanding of the dynamics of district instructional reform remains of significant interest (Boyd 2008). Researchers conclude that OL work has become more fragmented and suggest that future research take strides toward integrating parallel approaches (Knapp, 2008).

2.1. Organizational Learning Theory

Greenfield (1995) and Johnson and Fauske (2000) argue that organizational theory has richly informed the study of human behavior and organizations. Leithwood and Seashore Louis (1998) add that organizational theory elements are borrowed to study schools and educational leaders and to assess organizational change in education. Whyte (1997) believes that the social-psychological perspective emphasize relationships among the organization members and assert that an organization is its people. The socio-technical perspective on organizations offer a blend of emphases exploring both social cognitive systems and structural technical systems within organizations as mutually dependent that a change in the technical system necessarily impacts on the functioning of the social system and a change in the social system has impacts on the technical system.

One theoretical model that has reflected the dual emphasis of structural technical and social cognitive systems is organizational learning theory. Organizational learning theory includes both system-structural and interpretive dimensions which include organizations’ structures and systems for decision-making as well as sharing data and information, and interpretive dimensions involve the meaning that is assigned to the data and information.

Thus, organizational learning theory encompasses both structural technical and social cognitive systems. (Daft and Huber, 1987)

Organizational learning theory is grounded in cognitive and social psychology and defines learning as organizational change. Researchers agree that an organization learns through the individual learning. Kim (1993) contends that a cognitive perspective deals with the individual learning which involves storing, retrieving, transforming, and applying information; such information processing relies on memory as a storage device where everything people perceive and experience is filed away. Memory is not simply a static storage device but changes as it accommodates new information. Memories exist in individuals and when individuals have shared knowledge and experience, such as that evolving from participation in an organization; they may also have shared memories. Collections of memories that guide responses and are interconnected around specific experiences are called mental models.

Raybould argues that "*mental models function by activating memories and responses that are previously developed to solve earlier problems or to address previous incidents. They include knowledge, assumptions, beliefs, values, emotions, and norms that guide behaviors and actions*" (Raybould, 2000 : p. 39). Mental models provide the context in which to view and interpret new material, and they determine how stored information is relevant to a given situation. Kim (1993) describes mental models as having two dimensions: routines, reflecting operational components, and frameworks, reflecting the conceptual knowledge components. The routines dimension represents the *doing* components of memories; the frameworks dimension represents the *thinking* components. Routines are enacted from frameworks that reflect reasons for actions based on existing schema. Thus, mental models include both cognitive and behavioral components.

Both memory and mental models in organizations can be shared across individuals and can inform collective as well as individual action (Schein, 1992). As people join an organization, they assimilate organizational memories and mental models that are shared by other people in the organization. These newcomers also can dynamically shape organizational memory, frameworks, and

routines by negotiating new norms and introducing new ways of working or solving problems. Elements of these shared memories and mental models are sustained within the organization even as individuals come and go. Organizational memory is the organization's collective knowledge, beliefs, assumptions, and norms that shape procedures, policies, and culture over time (Cousins, 1998). In conclusion, shared mental models include what an organization "knows", what it pays attention to, how it assesses situations, how it behaves, and what it remembers (Kim, 1993, Senge, 1990). The research of how organizational mental models and memories emerge and change is the focus of organizational learning theory.

Moreover, collective learning is another term for the development of shared memories and mental models. It refers to the learning of groups within an organization. Whether referred to as teams, *"collaborative work groups, or cross-functional task forces, groups "are becoming the key learning unit in organizations"* (Senge, 1990, p. 236). *Senge argues that "collective learning remains poorly understood, despite its importance".* (Senge, 1990, p 238). Leithwood (1998), Hackman (1990) and others (Hackman et al., 2002) likewise contend that group learning is important to the exploration of organizational learning in schools. Leithwood (1998) builds on the work of Neck and Manz (1994) to describe group learning as mutual adaptation of members resulting in collective patterns of action. The extent to which routines and frameworks of individual become shared over time influences the development of group culture and vision and, in turn, can influence the culture and vision of the organization as a whole. Robinson (2002) maintains that such organizational learning can be deliberative (planned and logical) or non-deliberative (unplanned and non-logical) and argues that the study of organizational learning must focus on conditions under which overt, deliberative attempts at change can succeed.

Argyris and Schon (1996) believe that organizational learning (OL) is a product of organizational inquiry that whenever expected outcome differs from actual outcome, an individual (or group) will engage in inquiry to understand and solve this inconsistency. In the process of organizational inquiry, the individual will interact with other members of the organization and learning will take place. Learning is a direct product of this interaction. They emphasize that this interaction

often goes well beyond defined organizational rules and procedures. Their approach to organizational learning theory is based on the understanding of two approaches namely *espoused theory* and *theory-in-use*.

Espoused theory refers to the formalized part of the organization. Every organization will tend to have various instructions regarding the way employees should conduct themselves in order to carry out their jobs problem solving. These instructions are often specific and narrow in focus, confining the individual to a set path. On the other hand, *theory-in-use* is the actual way things are done. Individuals will rarely follow espoused theory and will rely on interaction and brainstorming to solve a problem. Theory in use refers to the loose, flowing and social way that employees solve problems and learn.

Although the mismatch between these two approaches of organizational learning, organizations are encouraged to accept theory in use to make it easy for the individual to interact with his working environment in an undefined and unstructured way. Essentially they should provide the right environment for organizational inquiry to take place, unconstrained by formal procedures.

Levitt and March (1996) expand further on the dynamics of organizational learning theory. Their view presents the organization as routine-based, history dependent, and target oriented. While lessons from history are stored in the organizational memory, the event itself is often lost. Levitt and March note that past lessons are captured by routines "*in a way that makes the lessons, but not the history, accessible to organizations and organizational members.*" (Levitt and March, 1996 : p. 85) The problem most organizations face is that it is usually better to have the event rather than the interpretation. OL is transmitted through socialization, education, imitation and so on, and can change over time as a result of interpretations of history.

2.2. Types of Learning in Educational Organization

Argry and Schon (1996) identify three levels of learning which may be present in the organization:

- a) Single loop learning: Consists of one feedback loop when strategy is modified in response to an unexpected result (error correction).

- b) Double loop learning: Learning that results in a change in theory-in-use. The values, strategies and assumptions that govern action are changed to create a more efficient environment.
- c) Deuterolearning: Learning about improving the learning system itself. This is composed of structural and behavioral components which determine how learning takes place. Essentially deuterolearning is therefore "learning how to learn."

Effective learning must therefore include all three, continuously improving the organization at all levels. However, while any organization will employ single loop learning, double loop and particularly deuterolearning are a far greater challenge.

Organizational Learning Theory may affect knowledge management as follows:

- OL is dependent on allowing organizational inquiry to take place according to theory-in-use, not espoused theory;
- OL is a complex mechanism, resulting often in the storage of interpretations of past events, rather than the events themselves;
- OL can take place on three different levels. While single loop learning comes natural to any individual/organization, special attention must be paid to the double-loop and deuterolearning.

2.3. Models of Organizational Learning and Knowledge Management

There are various ways to conceptualize the relationship between knowledge management (KM) and organizational learning (OL). Easterby-Smith and Lyles (2003) consider OL to focus on the process, and KM to focus on the content of the knowledge that an organization acquires, creates, processes and eventually uses. Another way to conceptualize the relationship between the two areas is to view OL as the goal of KM. By motivating the creation, dissemination and application of knowledge, KM initiatives pay off by helping the organization embed knowledge into organizational processes so that it can continuously improve its practices and behaviors and pursue the achievement of its goals. From this

perspective, organizational learning is one of the important ways in which the organization can sustainably improve its utilization of knowledge.

Dixon (1994) describes an organizational learning cycle, as an accumulated knowledge that is of less significance than the processes needed to continuously revise or create knowledge". These processes are closely related to the notion of "*continuous improvement through which an organization continuously identifies implements and institutionalizes improvements. "The improvements are embedded in the organization through routines that may be written policies, prescribed machine settings, quality control limits or "best practices"* (Dixon (1994 : p. 174) for dealing with frequently occurring circumstances.

Knowledge management and organizational learning are connected technically. The presented model would exhibit how KM programs are linked to organizational learning environment and two of the organizational perspectives that are brought by learning processes will be presented emancipation and exploitation.

The theoretical approach of knowledge management leads implicitly to a myriad find alternative of perspectives that try to explain the most important conditions for a successful knowledge management program. Therefore, knowledge management will lead an organization to identify all the needed processes that add value to learning experience, through the use of intellectual capital. Starting from the hypothesis that knowledge management and organizational learning are the link between the intellectual capital development and how these concepts are inter-related.

2.4. Efficient Innovation for Sharing Knowledge

Students learn about the general goal of efficiently solving a future set of *recurring* problems. In preparation for meeting this goal, they are encouraged to adopt, adapt and invent "smart tools" that can help them work of efficiently and efficiently. Graphs, charts, spreadsheets, computer simulations, social networks, norms for distributed expertise.

The idea of helping students learn to create tools for working smart can be illustrates in the context of an implementation. The problems *what if* analogs vary quantities and constraints. However, the challenges the students receive are time limited and required fast, efficient thinking. This mismatch is common to many

creative curricula (e.g., thinking skills programs) where students complete innovation activities but frequently get assessed in terms of efficiency –oriented standardized tests.

Solving each problem anew is inefficient. Ultimately, students learned to develop tools such as graphs and spread sheets that allowed them to work smart and perform much better at answering “clients’ questions” than groups who stuck only with their calculators (Bransford et al., 2000).

3. Learning Theories

Learning is defined as a process of bringing together personal and environmental experiences and influences for acquiring, enriching or modifying one’s knowledge, skills, values, attitudes, behavior and world views. Learning theories develop hypotheses that describe how this process takes place. The major concepts and theories of learning include behaviorist theories, cognitive psychology, constructivism, social constructivism, experiential learning, multiple intelligence, and situated learning theory and community of practice.

3.1. Behaviorism Theory

Behaviorism is a theory of animal and human learning that only focuses on objectively observable behaviors and discounts mental activities. Behavior theorists define learning as nothing more than the acquisition of new behavior. There are two different types of conditioning, each yielding a different behavioral pattern. First, classic conditioning occurs when a natural reflex responds to a stimulus. The most popular example is Pavlov’s observation that dogs salivate when they eat or even see food. Essentially, animals and people are biologically “wired” so that a certain stimulus will produce a specific response. Second, Behavioral or operant conditioning occurs when a response to a stimulus is reinforced. Basically, operant conditioning is a simple feedback system: If a reward or reinforcement follows the response to a stimulus, then the response becomes more probable in the future. For example, leading behaviorist B.F. Skinner used reinforcement techniques to teach pigeons to dance and bowl a ball in a mini-alley.

The behaviorist perspectives of learning originated in the early 1900s, and became dominant in early 20th century. Ammerman *et al.* contends that "*The basic idea of behaviorism is that learning consists of a change in behavior due to the acquisition, reinforcement and application of associations between stimuli from the environment and observable responses of the individual*" (Ammerman *et al.* 2002: p. 67). Behaviorists are interested in measurable changes in behavior. Thorndike, one of the major behaviorist theorists, put forward that (1) a response to a stimulus is reinforced when followed by a positive rewarding effect, and (2) a response to a stimulus becomes stronger by exercise and repetition. This view of learning is akin to the "drill-and-practice" programs. Skinner is another influential behaviorist, proposed his variant of behaviorism called *operant conditioning*. In his view, rewarding the right parts of the more complex behavior reinforces it, and encourages its recurrence. Therefore, reinforcers control the occurrence of the desired partial behaviors. Learning is understood as the step-by-step or successive approximation of the intended partial behaviors through the use of reward and punishment. The best known application of Skinner's theory is clarified by Bandura "*programmed instruction*" whereby the right sequence of the partial behaviors to be learned is specified by *elaborated task analysis*. (Bandura A. 1986: p. 98).

The theory relies on observable behavior and describes several universal laws of behavior. Its positive and negative reinforcement techniques can be very effective—both in animals, and in treatments for human disorders such as autism and antisocial behavior. Teachers reward or punishment adopt such theory

There have been many criticisms of behaviorism learning theory. It does not account for all kinds of learning, since it disregards the activities of the mind, and it does not explain some learning—such as the recognition of new language patterns by young children—for which there is no reinforcement mechanism.

3.2. Cognitive Theory

Cognitive psychology was initiated in the late 1950s, and contributed to the move away from behaviorism. People are no longer viewed as collections of responses to external stimuli, as understood by behaviorists, but information processors. Cognitive psychology paid attention to complex mental phenomena, ignored by behaviorists, and is influenced by the emergence of the computer as an

information-processing device, which became analogous to the human mind. In cognitive psychology, learning is understood as the acquisition of knowledge: the learner is an information-processor who absorbs information, undertakes cognitive operations on it, and stocks it in memory. Therefore, its preferred methods of instruction are lecturing and reading textbooks; and, at its most extreme, the learner is a passive recipient of knowledge by the teacher.

Jean Piaget (1896-1980) is renowned for constructing a highly influential model of child development and learning. Piaget's theory is based on the idea that the developing child builds cognitive structures, mental maps, schemes, or networked concepts for understanding and responding to physical experiences within his environment. Piaget further attested that a child's cognitive structure increases in sophistication with development, moving from a few innate reflexes such as crying and sucking to highly complex mental activities (Wadsworth, 1996).

Wadsworth (1996) gave a full account of Piaget's theory. He explained that Piaget identifies four developmental stages and the processes by which children progress through them. The four stages are: *Sensorimotor stage (birth - 2 years old)*—The child, through physical interaction with his environment, builds a set of concepts about reality and how it works. This is the stage where a child does not know that physical objects remain in existence even when out of sight; *Preoperational stage (ages 2-7)*—The child is not yet able to conceptualize abstractly and needs concrete physical situations; *Concrete operations (ages 7-11)*—As physical experience accumulates, the child starts to conceptualize, creating logical structures that explain his physical experiences. Abstract problem solving is also possible at this stage. For example, arithmetic equations can be solved with numbers, not just with objects and *Formal operations (beginning at ages 11-15)*—By this point, the child's cognitive structures are like those of an adult and include conceptual reasoning.

Piaget, moreover, outlined several principles for building cognitive structures. During all development stages, the child experiences his environment using whatever mental maps he has constructed. If the experience is repeated again, it is assimilated—into the child's cognitive structure so that he maintains mental equilibrium. If the experience is different or new, the child loses equilibrium

and alters his cognitive structure to accommodate the new conditions. The child erects more and more adequate cognitive structures.

Bandura (1986) argued that cognitive learning theory is based on the structure and function of the brain. The brain is fulfilling its normal processes learning takes place. This theory is based on that everyone can learn, yet the reality is that everyone does learn. Every person is born with a brain those functions as an immensely powerful processor. Traditional schooling often inhibits learning by discouraging, ignoring, or punishing the brain's natural learning processes.

The core principles of brain-based learning consider the brain is a parallel processor and meaning can perform several activities at once, like tasting and smelling. Learning engages the whole physiology. The search for meaning is innate and it comes through patterning. Emotions are critical to patterning. The brain processes wholes and parts simultaneously. Learning involves both focused attention and peripheral perception. Learning involves both conscious and unconscious processes. Individuals have two types of memory: spatial and rote. They understand better when facts are embedded in natural, spatial memory. Learning is enhanced by challenge and inhibited by threat. Each brain is unique.

There are three instructional techniques associated with brain-based learning are: (i) orchestrated immersion: creating learning environments that fully immerse students in an educational experience; (ii) relaxed alertness: trying to eliminate fear in learners, while maintaining a highly challenging environment; (iii) active processing—allowing the learner to consolidate and internalize information by actively processing it.

The brain works has a significant impact on what kinds of learning activities are most effective. Educators need to help students have appropriate experiences and capitalize on those experiences. Teachers must immerse learners in complex, interactive experiences that are both rich and real. One excellent example is immersing students in a foreign culture to teach them a second language. Educators must take advantage of the brain's ability to parallel process. Students must have a personally meaningful challenge. Such challenges stimulate a student's mind to the desired state of alertness. In order for a student to gain insight about a problem, there must be intensive analysis of the different ways to approach it, and

about learning in general. This is what's known as the active processing of experience (Wadsworth, (1996).

Because every brain is different, educators should allow learners to customize their own environments. Designers of educational tools must be artistic in their creation of brain-friendly environments. Instructors need to realize that the best way to learn is not through lecture, but by participation in realistic environments that let learners try new things safely.

This theory of the structure and functions of the mind suggests that the two different sides of the brain control two different "modes" of thinking. It also suggests that each of us prefers one mode over the other. Experimentation has shown that the two different sides, or hemispheres, of the brain are responsible for different manners of thinking. The following table illustrates the differences between left- brain and right-brain thinking: (i) Left Brain Logical Sequential Rational Analytical Objective Looks at parts; (ii) Right Brain Random Intuitive Holistic Synthesizing Subjective Looks at wholes.

Most individuals have a distinct preference for one of these styles of thinking. Some, however, are more whole-brained and equally adept at both modes. In general, schools tend to favor left-brain modes of thinking, while downplaying the right-brain ones. Left-brain scholastic subjects focus on logical thinking, analysis, and accuracy. Right- brained subjects, on the other hand, focus on aesthetics, feeling, and creativity.

Social cognition-learning model asserts that culture is the prime determinant of individual development. Humans are the only species to have created culture, and every human child develops in the context of a culture. Therefore, a child's learning development is affected in ways large and small by the culture—including the culture of family environment—in which he or she is enmeshed.

Culture makes two sorts of contributions to a child's intellectual development. First, through culture children acquire much of the content of their thinking, that is, their knowledge. Second, the surrounding culture provides a child with the processes or means of their thinking, what Vygotskians call the tools of intellectual adaptation. In short, according to the social cognition-learning model, culture teaches children both what to think and how to think.

Cognitive development results from a dialectical process whereby a child learns through problem-solving experiences shared with someone else, usually a parent or teacher but sometimes a sibling or peer. Initially, the person interacting with child assumes most of the responsibility for guiding the problem solving, but gradually this responsibility transfers to the child. Language is a primary form of interaction through which adults transmit to the child the rich body of knowledge that exists in the culture. As learning progresses, the child's own language comes to serve as his primary tool of intellectual adaptation. Eventually, children can use internal language to direct their own behavior. Internalization refers to the process of learning—and thereby internalizing—a rich body of knowledge and tools of thought that first exist outside the child. This happens primarily through language. A difference exists between what child can do on his own and what the child can do with help. Vygotskians call this difference the zone of proximal development. Since much of what a child learns comes from the culture around his and much of the child's problem solving is mediated through an adult's help, it is wrong to focus on a child in isolation. Such focus does not reveal the processes by which children acquire new skills. Interactions with surrounding culture and social agents, such as parents and more competent peers, contribute significantly to a child's intellectual development (Wadsworth, 1996).

3.3. Constructivism Theory

Duffy and Jonassen (1992) contends that Constructivism theory emerged in the 1990s, giving rise to the idea that learners are not passive recipients of information, but that they actively construct their knowledge in interaction with the environment and through the reorganization of their mental structures. Learners are therefore viewed as sense-makers, not simply recording given information but interpreting it. This view of learning led to the shift from the “knowledge-acquisition” to “knowledge-construction” metaphor. The growing evidence in support of the constructive nature of learning was also in line with and backed by the earlier work of influential theorists such as Jean Piaget and Jerome Bruner. While there are different versions of constructivism, what is found in common is the learner-centred approach whereby the teacher becomes a cognitive guide of learner's learning and not a knowledge transmitter.

Oldfather (1999) constructivism theory is founded on the premise that reflecting on experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences. The major principles of constructivism are; learning is a search for meaning; meaning requires understanding wholes as well as parts; mental models must be understood to perceive the world; finally the purpose of learning is to construct meaning, not to memorize facts and information.

Learning theories build on social and constructivist theories of learning, but situate experience at the core of the learning process. The aim is to understand the manners in which experiences motivate learners and promote their learning. Therefore, learning is about meaningful experiences that lead to a change in an individual's knowledge and behaviors. Carl Rogers is an influential proponent of these theories, suggesting that experiential learning is "self-initiated learning" as people have a natural inclination to learn; and that they learn when they are fully involved in the learning process. Rogers put forward the following insight: (1) learning can only be facilitated: we cannot teach another person directly, (2) learners become more rigid under threat, (3) "significant learning occurs in an environment where threat to the learner is reduced to a minimum", (4) learning is most likely to occur and to last when it is self-initiated. He supports a dynamic, continuous process of change where new learning results in and affects learning environments. This dynamic process of change is often considered in literatures on organizational learning.

Howard Gardner, suggests there are at least seven ways that people have of perceiving and understanding the world. Gardner labels each of these ways a distinct "intelligence"—in other words, a set of skills allowing individuals to find and resolve genuine problems they face. Gardner defines an "intelligence" as a group of abilities that: Is somewhat autonomous from other human capacities. *"Verbal-Linguistic—The ability to use words and language; Logical-Mathematical—The capacity for inductive and deductive thinking and reasoning, as well as the use of numbers and the recognition of abstract patterns; Visual-Spatial—The ability to visualize objects and spatial dimensions, and create internal images and pictures; Body-Kinesthetic—The wisdom of the body and the ability to control physical motion; Musical-Rhythmic—*

The ability to recognize tonal patterns and sounds, as well as a sensitivity to rhythms and beats; Interpersonal–The capacity for person-to-person communications and relationships; Intrapersonal–The spiritual, inner states of being, self-reflection, and awareness." (Gardner, 1983 ; p.)

Challenging the assumption in many of the learning theories that learning is a universal human process that all individuals experience according to the same principles, Howard Gardner (1983) elaborated his theory of *multiple intelligences*. His theory also challenges the understanding of intelligence as dominated by a single general ability. Gardner argues that every person's level of intelligence actually consists of many distinct "intelligences". These intelligences include: logical-mathematical, linguistic, spatial, musical, bodily-kinesthetic, interpersonal, and intrapersonal. Although his work is speculative, his theory is appreciated by teachers in broadening their conceptual framework beyond the traditional confines of skilling, curriculum and testing. The recognition of multiple intelligences, for Gardner, is a means to achieving educational goals rather than an educational goal in and of itself.

Neuroscience is the study of the human nervous system, the brain, and the biological basis of consciousness, perception, memory, and learning. The nervous system and the brain are the physical foundation of the human learning process. Neuroscience links our observations about cognitive behavior with the actual physical processes that support such behavior. This theory is still "young" and is undergoing rapid, controversial development.

Oldfather (1999) discussed some of the key findings of neuroscience are: *The brain has a triad structure*. Our brain actually contains three brains: the lower or reptilian brain that controls basic sensory motor functions; the mammalian or limbic brain that controls emotions, memory, and biorhythms; and the neocortex or thinking brain that controls cognition, reasoning, language, and higher intelligence.

- a) *The brain is not a computer*. The structure of the brain's neuron connections is loose, flexible, "webbed," overlapping, and redundant. It's impossible for such a system to function like a linear or parallel- processing computer. Instead, the brain is better described as a self- organizing system.

- b) *The brain changes with use, throughout our lifetime.* Mental concentration and effort alters the physical structure of the brain. Our nerve cells (neurons) are connected by branches called dendrites.
- c) There are about 10 billion neurons in the brain and about 1,000 trillion connections. The possible combinations of connections are about ten to the one-millionth power. As we use the brain, we strengthen certain patterns of connection, making each connection easier to create next time. This is how memory develops.

When educators take neuroscience into account, they organize a curriculum around real experiences and integrated, “whole” ideas. Also, they focus on instruction that promotes complex thinking and the “growth” of the brain. Neuroscience proponents advocate continued learning and intellectual development throughout adulthood.

Situated cognition and learning that emphasized the significant role of context, particularly social interaction. Criticism against the information-processing constructivist approach to cognition and learning became stronger as the pioneer work of Vygotsky as well as anthropological and ethnographic research by scholars like Rogoff and Lave came to the fore and gathered support. The essence of this criticism was that the information-processing constructivism saw cognition and learning as processes occurring within the mind in isolation from the surrounding and interaction with it. Knowledge was considered as self-sufficient and independent of the contexts in which it finds itself. In the new view, cognition and learning are understood as interactions between the individual and a situation; knowledge is considered as situated and is a product of the activity, context and culture in which it is formed and utilized. This gave way to a new metaphor for learning as “participation” and “social negotiation”. (Bandura, 1997)

3.4. Social Learning Theory

Bandura (1986) gave thorough review of a well-known social learning theory which developed by Albert Bandura, who works within both cognitive and behavioral frameworks that embrace attention, memory and motivation. His theory of learning suggests that people learn within a social context, and that learning is

facilitated through concepts such as modeling, observational learning and imitation. Bandura put forward “reciprocal determinism” that holds the view that a person’s behavior, environment and personal qualities all reciprocally influence each others. He argues that children learn from observing others as well as from “model” behavior, which are processes involving attention, retention, reproduction and motivation. The importance of positive role modeling on learning is well documented.

Social learning theory/ observational learning theory imitates the model’s behavior if the model possesses characteristics– things such as talent, intelligence, power, good looks, or popularity–that the observer finds attractive or desirable. The observer will react to the way the model is treated and mimic the model’s behavior. When the model’s behavior is rewarded, the observer is more likely to reproduce the rewarded behavior but when the model is punished the observer is less likely to reproduce the same behavior. There is a distinction between an observer’s acquiring a behavior and performing a behavior. *“Through observation, the observer can acquire the behavior without performing it. Later, the observer may display the behavior. Learning by observation involves four separate processes: attention, retention, production and motivation. Attention is that observers cannot learn unless they pay attention to what’s happening around them”* (Bandura, 1986 : p. 251). This process is influenced by characteristics of the model, such as how much one likes or identifies with the model and by characteristics of the observer, such as the observer’s expectations or level of emotional arousal. *Retention* is that observers must not only recognize the observed behavior but also remember it at some later time. These processes depend on the observer’s ability to code or structure the information in an easily remembered form or to mentally or physically rehearse the model’s actions. *Production* is that observers must be physically and intellectually capable of producing the act. In many cases the observer possesses the necessary responses. Reproducing the model’s actions may involve skills the observer has not yet acquired. It is one thing to carefully watch a circus juggler. *Motivation* is that observers will perform the act only if they have some motivation or reason to do so. The presence of reinforcement or punishment, either to the model or directly to the observer, becomes most important. Attention and retention account for acquisition or learning of a model’s behavior; production and motivation control the performance.

Human development reflects the complex interaction of the person's behavior and the environment. The relationship between these elements is called *reciprocal determinism*. A person's cognitive abilities, physical characteristics, personality, beliefs, attitudes, and so on influence both his or her behavior and environment. These influences are reciprocal. A person's behavior can affect his feelings about himself and his attitudes and beliefs about others. Likewise, much of what a person knows comes from environmental resources such as television, parents, and books. Environment also affects behavior: what a person observes can powerfully influence what he does and in turn the person's behavior also contributes to his environment.

Social learning theory in organizational learning literature has been coined under several names such as situated learning, practice-based learning, actor-network theory, cultural-historical activity theory and 'learning as cultural processes. The preferred term is *social learning theory* to indicate that the realm of social theory. That the central point of learning is the lived and living experience of everyday life from an understanding of learning as participation in social processes emphasizing both issues of knowing and issues of being and becoming. The social learning theory encompasses both the *epistemology* and the *ontology* of learning. It considers both the issue of human existence, development, and socialization *ontology* and the issue of people coming to know about themselves and what it means to be part of the world *epistemology*. Hence, socialization and learning are inseparable processes and they constitute each other in an understanding of learning as participation in social processes.

Bandura discussed social learning by "*how social learning theory contributes to an understanding of organizational learning and what it adds to an understanding of organizational learning that cannot be included in a deviation of individual learning theory*" (Bandura, 1986 : p. 107). Much of literature on organizational learning is established in individual learning theory. The focus of the individual learning theory is on learning as inner mental processes related to the acquisition and processing of information and knowledge. It leads to mind being the locus of learning and consequently there is a separation of body and mind, emotion and cognition as well as learner and context. That means the focus of learning is on how learners become knowledgeable in a purely cognitive sense, and not considering the context of learning where learning, developing identity and socialization are existed.

That neglecting the ontological dimension of learning, *coming to be*, and only focusing on the epistemological dimension, *getting to know*.

John Dewey's concepts of experience in which experiencing is viewed as intrinsically psychical, mental, and private processes. Dewey's notion of experience is a non-dualist concept covering the individual and the world, and it is culturally mediated. Moreover, Dewey's concept of inquiry is not related to the overall creation of individual and collective, cultural and historical knowledge. Dewey's concepts of experience and inquiry are bridging conceptual gaps in coining a social learning theory for organizational learning. The purpose is to explore the contribution of social learning theory to the field of organizational learning. Social learning theory builds upon a critique of individual learning theory. The two learning theories will be dealt with to figure out their contribution to the organizational learning (Oldfather, 1999).

Cyert and March (1963) mention that organizational learning was first coined as theories of organizational behavior within the field of management science. It dealt with information processing and decision making in organizations to help organizations learn to adapt to changes in the environment and to provide prescriptive managerial techniques. Senge (1990) coined the counterpart term *Learning Organization* which paves the way for organizational learning. Both learning organization and organizational learning have proved to be powerful models for organizational development.

The learning theory in organizational learning is inspired by individual-oriented psychology. Enhancing information processing and decision making in organizations are considered to be done by individuals. Hence, individuals' learning outcome can be a way of individuals' acting on behalf of an organization, be crystallized in organizational routines and values and become organizational learning. The idea is that individuals hold a mental model in their mind which is an abstract representation of their actions. The mental model leads to better decision making in organizations to enhance information processing (Senge, 1990).

Learning is identical to the enhancement of individuals' mental models, and takes place when individuals acquire information and knowledge which subsequently can guide their individual and the organizational behavior. The focus on mental

modeling as the essence of learning in individual learning theory is the reason for naming individual learning theory cognitive learning theory. Furthermore, mental models may also be termed as cognitive structures. It is a focus on learning, which is directed towards what goes on in the minds of people.

Lave (1988) Nicolini and Mezner (1995) state that a cognitive learning theory emphasizes the idea of abstract, general, verbal and conceptualized knowledge over the body and actions. It emphasizes the importance of learning to think of organizations as systems. This is an understanding of organizational learning as an abstract entity.

Understanding of organizations as a system is composed of a predetermined set of elements that each has a different function in the rational constitution. Leavitt (1965) presents that there are five central elements in a system understanding of organizations that include *social structure, participants, goals, technologies, and the environment*. In the organizations system, *"the focal point for organizational learning is to acquire explicit and implicit knowledge and integrate the acquired knowledge in organizational activities and routines. The goal of knowledge acquiring is to optimize the organizational outputs"* (Leavitt, 1965: p. 131). Thus, the basic maxim is to be knowledgeable about the system and to think of the organization as a system.

Individual learning in organizations creates the problem of transferring individual learning outcome to that of the organization. This view of the relation between individual and organization creates a conceptual separation between individuals and an organization. McDermott (1993) explains the relationship between the individual learning outcome and the organization as a relation resembling that between soup and bowl, the soup does not shape the bowl, and the bowl does not alter the substance of the soup. Thus, individual and organization, soup and bowl, 'can be analytically separated and studied on their own without doing violence to the complexity of the situation.

In individual learning theory, learning is a process for individuals to become knowledgeable for the benefit of the organization. Learning comes about through individuals' work with their cognitive structures and it is possible to analytically separate individuals and an organization as a system. The acknowledged problem in

organizational learning based upon individual learning theory is the individual-organization dissociation "*how to make individual learning outcome organizational*" (McDermott, 1993 : p. 54).

Organizational learning that rests upon individual learning theory separates epistemology, to come to know about the world, from ontology, to act in and become part of the world. It is a split between learning and socialization, which indicates a possibility for individuals' learning of particular content for the purpose of changing a system.

Larochelle *et al.* (1998) argue that social learning theory in organizational learning and social constructivist appear together which later turn in social science and educational studies. The idea of localizing the leaning in the individual mind is questioned in a number of research fields. "*The main concerns are uttered if learning begins with change in cognitive structures, "how is it possible to learn from practice and practicing?"*", on the other hand, questions such argument "*how is it possible to understand knowledge as situated?, that is, we see an individual can be knowledgeable in one organizational context, and not in another comparable one*" (Lave, 1988 : p. 174).

Cook and Brown (1999) and Nicolini et al. (2003) believe that there are two main important issues to be taken into account in organizational learning namely access to participation and power. It is argued that individuals are both *produce* and *products* of situations mirroring access and power. This *situated* view of learning moves it away from individual mind to the social sphere of interaction, activity, and practice; and this has paved the road for another view on learning and knowledge. Other scholars like Vygotsky contend that social learning theory in organizational learning is introduced with regard to the content and process of learning and the relation between the individual and the organization as well as an understanding of organization.

Learning in organizational learning literature is part of everyday organizational life and work. It cannot be avoided or refused and it is not be restricted to taking place inside individuals' minds but as processes of participation and interaction. That is, learning takes place among and through other people and artifacts as a relational activity, not an individual process of thought. Lave and

Wenger (1991) believe that the changes of viewing the locus of learning process from the mind of individuals to the participation patterns of individual members of organizations in which learning takes place is the main argument of social learning process.

Fincham, and Clark (2006) argue that in social learning theory, the central issue of learning is to become a skilled practitioner. Learning is practical rather than an epistemic accomplishment, and it is an identity development and socialization. Changing the content of learning from knowledge acquisition to socialization expands the concept of learning to include an ontological dimension. In social learning theory, knowledge is the active process of knowing, the processes and results of participation in organizational practices. Learners are to make sense of their participation in the social processes of organizing in which knowledge is distributed among organizational members.

The content to be learned is context specific, and the process learning is to discover what to be do, when and how to do it according to the organizational routines. Also, learning is to give a reasonable account of why things happen and of what kind of person one must become in order to be a skilled member of a specific organization. In social learning theory, to know is to be capable of participating with the requisite competence in the complex relationships among people, artifacts, and activities. Raz and Fadlon (2006) learning is to acquire a *situated curriculum*, that is to acquire the patterns of learning opportunities available to participants in such specific organization. Learning enables people to modify their relations to others while contributing to the shared activity. Contu and Willmott (2003) suggest that moving learning away from inside mind to social relations is also moving learning into an area of conflicts and power. Consequently, the issue of empowerment is essential, as learning requires access and opportunity to take part in the ongoing practice. The social structure of this practice defines the possibilities for learning.

Language is an essential element the process of learning. It is not only a means of knowledge transmission. It is the medium of culture so it is a crucial element in the process of learning. Gherardi et al., (1998) suggest that the study of organizational learning is to explore the specific contexts of activities and social

practices in which learning may occur through the understanding of the circumstances and of how the participants construct to validate the interpretation of a learning activity.

One can conclude that the content and process of social learning theory in organizational learning emphasizes informality, improvisation, collective action, conversation, and sense making; and learning is of a distributed and provisional nature. Gherardi (1999) agrees with this notion of learning, that is to say learning is not to acquire already known knowledge but is processes of moving into unknown area to face mystery. Learning is to make a journey into the land of discovery rather than to follow an already paved road.

Individual learners are to be engaged in sense making and to create knowledge within and among their trajectory of participation, they are to be understood as participants in the social processes of everyday life of an organization. The organization is the environment which provides the interpretations of what goes on.

The understanding of the organizations within social learning theory of organizational learning can be understood as communities of practice (CoP). Lave and Wenger (1991) and Wenger (2000) define CoPs as organizations that are cultural, historical and material collectives constituted by social interaction. *"These organizations are constructed from social interaction and are dependent on the situated and contextualized aspects of the specific social practices. The main assumption for organizational learning in this perspective is that knowing is something that emerges from social collective practices."* (Wenger, 2000 : p. 87). It considers individuals as part of a specific organizational practice as well as of patterns of participation and interaction. Hence, the focus is on *situated meaning* considering context as a historical product in organizational learning. Gherardi et al. (1998) argue that context must be conceived as a historical and social product which is co-produced together with the activity it supports namely agents, objects, activities, and material and symbolic artifacts which constitute a heterogeneous system that evolves over time.

One can conclude that in social learning theory both individuals minds and actions are regarded as related to their participation in social practices formed by

culture and history. Thus knowing is always an integral part of broader changes of being, which can be traced to learners' participation in CoPs. Knowing is a way of participating and of relating. Consequently, in social learning theory it is not possible to separate knowing from being and becoming. To be and become or emerge as a knowledgeable person requires participation in social processes. One may recall the Dewey's notions of experience and inquiry to see that the ontological dimension of learning, *how individuals come to be*, and the epistemological dimension, *how individuals come to know*, are inseparable. That means that both socialization and learning are inseparable processes.

Individuals acquire experience as an outcome of the way they live and the way they associate with others. Individuals learn from their experiences when they use their ability not only contemplate the relation between their actions and their consequences, but also to relate them to their past, present, and future experiences. McDermott (1973) believes that the provocative element in the development of experience is when there is a sense of habitual actions being upset. This feeling cannot be forced upon anybody from the outside, but it must come from experience or from the parameters of expanding experience. Of course, one can see that there is a distinction between the ability of an individual to know to do.

Dewey³ (1980) puts it very that there are no dualisms such as psychological-physical, fact-value, culture-nature, and theory-action. He regards theories as tools to cope with situations and events in life and to construct meaning by applying concepts in an experimental way, rather than understanding intellectual capacities and bodily actions as two different activities and phenomena. Some nonverbal experiences may not be apprehended as knowledge since they do not enter a sphere of communication with others. It is not clear that how non-cognitive and cognitive experience transfer, but if learning is to occur from experience, experience must separate from the physical, non-discursive perspective to emotional into the cognitive and communicative sphere. Only when individuals' experiences turn into communicative experiences and become learning experiences can they inform future practice. Dewey

³Dewey, J. (1980). *Art as Experience* Perigee Books, (Based originally on Dewey's lectures on esthetics, this book is considered the most distinguished work ever written by an American on the formal structures and characteristic effects of all the arts).

argues that *'to learn from experience' is to make a backward and forward connection between what we do to things and what we enjoy or suffer from things in consequence. Under such conditions, doing becomes a trying; an experiment with the world to find out what it is like; the undergoing becomes instruction-discovery of the connection of things. Two conclusions important for education follow. (1) Experience is primarily an active-passive affair; it is not primarily cognitive. But (2) the measure of the value of an experience lies in the perception of relationships or continuities to which it leads up. It includes cognition in the degree in which it is cumulative or amounts to something, or has meaning"* (Dewey , 1980: p. 137).

Dewey believes there are no universal cognitive structures that shape human experience of reality against the idea of dualism and a priori and innate to mind categories- space, time, causality, and object- as structuring human thinking. Knowledge for Dewey refers directly to human experience and the origin of knowledge is living experience. He considers thinking is as a process of inquiry and looking into things for investigating. Acquiring information is instrumental to the inquiry of something not known.

According to Dewey knowledge in the individual perspective is an answer to a problem. He discriminates between knowledge as propositional knowledge, which is a part of inquiry processes, and knowledge, that is, the result of the inquiry process that is fallibilistic in nature. Inquiry is a process that starts with a suspicion that there is a problem. Individual begins to define and formulate the problem by using the human ability to reason and think verbally through using previous experiences. Dewey believes that the individual tries to solve the problem by applying different working hypotheses and concludes by testing a solution model. The initial feeling of uncertainty must disappear before the problem has been solved. If the inquiry leads to new experiences, to learning, it requires thinking and reflection It establishes a relation between the action and the consequence(s) of the action where learning takes place.

Adopting a social learning theory in organizational learning focuses on the organizational context as a setting for organizational learning not individual mind. Social learning theory moves the focus from knowledge as the learning input to that of developing and socializing organizational members in order to turn them into

skilled practitioners. Knowledge becomes a way of enacting routines, experiences, rules, etc. competently in the organization instead of something that resides inside the human mind ready to be used whenever needed.

Social learning theory is criticized because it focuses too much on the organizational context. But the focus on organizational context does not omit the individual. The two are viewed as mutually constituted and continuously changing with the participants *moving* in and out of the specific context at hand. Hence, the change in the organizational context cannot take place without including the concrete and present participants in this context. "*A social learning theory cannot work in vacuum, it works with ideal-typical individuals who learn by changing their ways of thinking. Organizations consist of participants each with their own experiences, history and hopes for the future*" (Lave and Wenger, 1991: p. 141). This makes up the organizational context together with the specific work practice, the organizational rules and regulations. This is the starting point that learning and organizational learning begins to occur.

The contribution to social learning theory is to stress the coexistence between epistemology and ontology in learning. By focusing on the development of human experience as both encompassing processes of knowledge acquisition and being and becoming part of the world. It is to stress the interconnectedness of the development of individuals and organizations. The most beneficial contribution is the notion of inquiry, which provides a method in which thinking is regarded as a tool, a way to define problems, and reflection is included as a way of sharing learning outcome.

Finally, one can conclude that the most important skill will be the ability to make judgments, personal and collectively, and to be able to stand out as something separate and unique, as a person or an organization. The emphasis will be on innovation and the ability to learn innovatively with its notions of inquiry and experience in the past, present, and future. It will be a good theoretical instrument. The globalized economy will put an emphasis on learning as not only cognition or socialization skills but both. Hence, the ability to learn is to think in a different context where knowledge and judgmental power are distributed and demand continuous ability to learn and socialize.

4. Blended Learning

Blended learning is "a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path and/or pace."² To differentiate it from virtual schools, they add "at least in part at a supervised brick-and-mortar location away from home." Blended learning is a shift to an online delivery for a portion of the day to make students, teachers, and schools more productive, both academically and financially.

The term 'blended learning' as the principal means of addressing the use of Information and Communication Technologies (ICTs) to enhance its learning and teaching activities. In the Griffith context, the following definition is used to inform policy and practice in relation to blended learning: *"Blended learning is realized in teaching and learning environments where there is an effective integration of different modes of delivery, models of teaching and styles of learning as a result of adopting a strategic and systematic approach to the use of technology combined with the best features of face to face interaction."* (Krause, 2007 : p. 34)

Blended learning is about effectively integrating ICTs into course design to enhance the teaching and learning experiences for students and teachers by enabling them to engage in ways that would not normally be available or effective in their usual environment, whether it is primarily face-to-face or distance mode. In many cases the act of "blending" achieves better student experiences and outcomes, and more efficient teaching and course management practices. It can involve a mix of delivery modes, teaching approaches and learning styles.

Advances in technology provide new opportunities for teachers to design and deliver their courses in ways that support and enhance the teachers' role, the students' individual cognitive experiences, as well as the social environment; three key elements in successful learning and teaching. Blended learning technologies can:

- Broaden the spaces and opportunities available for learning;

- Support course management activities (e.g., communication, assessment submission, marking and feedback);
- Support the provision of information and resources to students;
- Engage and motivate students through interactivity and collaboration.

Blended learning is not just about using technology because it is available; it is about finding better ways of supporting students in achieving the learning objectives and providing them with the best possible learning and teaching experiences, as well as supporting teachers in their role (including the management and administration of courses). Of course, the integration of blended learning in courses will naturally vary according to such factors as: discipline, year level, student characteristics and needs, course or program learning objectives, as well as the academic's approach to teaching, and confidence and experience in using technology

4.1. Models of Blended Learning

Blended learning encourages students to have a personalized learning experience. This approach to schooling combines face-to-face instruction with online learning and has yielded strong results since officially being researched as an education strategy. Blended learning classes produce better results than their face-to-face, non-hybrid equivalents. This may be partly due to the fact that this rapidly growing model not only increases the flexibility and individualization of student learning experiences, but also allows teachers to expand the time they spend as facilitators of learning. Schools make the switch to blended learning for a variety of reasons. In addition to considering the age of the students, the reasons for choosing a blended model generally dictate which of the six models they choose to implement:

a) Face-to-Face Driver Model

Of all the blended learning models, face-to-face driver is the closest to a typical school structure. The introduction of online instruction is decided on a case-by-case basis, meaning only certain students in a given class will participate in any form of blended learning. The face-to-face driver approach allows students who are struggling or working above their grade level to progress at their own pace using technology in the classroom.

Some language schools have found face-to-face model to be a helpful way to engage English language learners (ELL), who sometimes fall behind not because they are incapable of understanding a concept, but because they're not native speakers.

b) Rotation Model

In this form of blended learning, students rotate between different stations on a fixed schedule – either working online or spending face-to-face time with the teacher. The rotational model is more widely used in elementary schools.

The rotational model of blended learning is determined to be an effective means of increasing the achievement of students. Students became more active learners and often challenged themselves to work harder and learn material that had not yet been introduced in their course work.

c) Flex Model

Schools supporting a large number of non-traditional choose the flex model of blended learning. The learning material is delivered online. Although teachers are in the room to provide on-site support as needed, learning is primarily self-guided, as students independently learn and practice new concepts in a digital environment. The flex model is an approach works with school district partners to address the needs of students with behavioral, academic or socio-economic challenges.

d) Online Lab Model

As schools face increasingly tighter resource constraints, the online lab model of blended learning is a viable option for helping students complete courses. Students learn entirely online to complete their coursework. This not only allows schools to offer courses for which they have no teacher or not enough teachers, but also allows students to work at a pace and in a subject area that suits them without affecting the learning environment of other students.

e) Self-Blend Model

The self-blend model of blended learning gives students the opportunity to take classes beyond what is already offered at their school. While these individuals will

attend a traditional school environment, they also opt to supplement their learning through online courses offered remotely. Students must be highly self-motivated to blended learning successful. Self-blend is ideal for the student who wants to take additional Advanced Placement courses.

f) Online Driver Model

Online Driver Model encourages students to work remotely and material is primarily delivered via an online platform. Although face-to-face check-ins are optional, students can usually chat with teachers online if they have questions. This model of blended learning is ideal for students who need more flexibility and independence in their daily schedules.

g) Blended learning modes

Blended learning spans a continuum that covers a wide range of activities between conventional face-to-face interactions and those that are fully online. Blended Learning Strategy identifies three modes of operation to indicate the level of use of technology in learning and teaching. The University aims for all courses to achieve “Mode 2” status through its Blended Learning Implementation Strategy.

Mode 1: Technology is used to facilitate course management and resources for learner support. For example, to provide information and resources to and to perform basic administrative function.

Mode 2: Technology is used to enrich the quality of the student learning experience through interactive learning activities beyond those attainable through face-to-face classroom interactions. For example, utilizing technology to support communication and collaboration, assessment and the management of your course.

Mode 3: Technology is used to support learning that is largely self-directed but also involves the use of interactive and collaborative learning activities. In this mode courses are delivered fully online.

4.2. The Process of Blended Learning

Blended learning is to designing technology-enhanced learning experiences to the ultimate success of quality learning. The learning and teaching activities need to be

meaningful and relevant for the students' learning. They also need to be clearly valued and supported by the teacher, and well integrated into the whole course experience. Wild (2007) argues that blended learning experiences should be participative, not just interactive. Hence, the processes of cognition and collaboration are both enhanced; Allen (2010) believes that thinking and working together creates learning which supports the idea of being participative.

Designing for blended learning requires a systematic approach, starting with:

1. **Planning** for integrating blended learning into a course work;
2. **Designing** and **developing** the blended learning elements;
3. **Implementing** the blended learning design;
4. **Reviewing** (evaluating) the effectiveness of your blended learning design, and finally;
5. **Planning** for the next delivery of the course then involves **improving** the blended learning experience for both staff and students.

a) **General Design Principles**

Course learning objectives, teaching and learning activities, and assessment tasks need to correspond with each other. That means (1) course resources and learning and teaching activities need to directly support students achievement of the stated learning objectives, and (2) assessment tasks need to be congruent with the activities and the objectives, and they need to allow students to demonstrate those learning objectives. This is called “constructive alignment” (Biggs, 1999).

Collaborative learning is based on the theory of ‘social constructivism’. This theory of learning views the individual’s learning taking place because of their interactions in a group. Class discussion, small group work and collaborative learning are all based on this theory. It is argued that student discussion develops students’ ability to test their ideas, synthesize the ideas of others, and build a deeper understanding of what they are learning. It also facilitates perspective taking, analysis of ideas, reasoning and critical thinking. Finally, such experiences can support the feeling of community and collaboration among students⁴.

⁴ Student activity beyond the classroom should ideally involve a combination of both individual and collaborative activities, as well as both formal and supplementary activity and resources, to support students in their learning and achievement of the course objectives.

b) Blended Learning Activities

The level of learning that students' achieve is often dependent on the type of activities and assessment tasks, and whether they are aligned with the set objectives or desired learning outcomes. One useful framework for considering learning objectives and suitable activities is Bloom's Taxonomy (Bloom, 1956), a hierarchical classification of the different objectives that are typically set for students. It shows the key classifications for the framework, followed by example terms for each.

Higher-order thought and skills

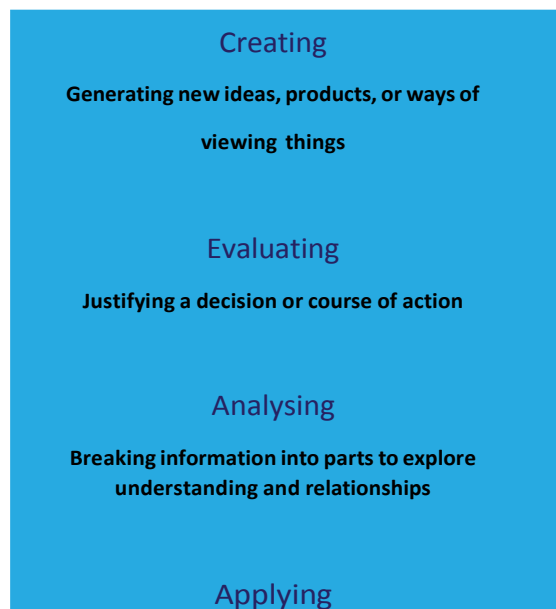


Figure (7) Bloom's taxonomy

Churches, (2008) has revised Bloom's taxonomy to suit a blended learning environment. This revision includes suggestions for tasks that can be used to support particular objectives. For example:

<i>Level of learning</i>	<i>Types of blended learning activities</i>
<p>Creating</p> <p>Designing, constructing, planning, producing, inventing</p>	<p>Programming, filming, animating, video/blogging, mixing/re-mixing, web publishing, webcasting, directing or producing – used to create a film, presentation, story, program, projects, media product, graphic art, vodcast, advertisement, model.</p>
<p>Evaluating</p> <p>Checking, hypothesizing, critiquing, experimenting, judging, testing</p>	<p>Debate or panel (using webcasting, web conferencing, online chat or discussion), investigating (online tools) and reporting (blog, wiki, presentation), persuasive speech (webcast, web document, mind map-presentation mode), commenting/moderating/reviewing/posting (discussion forums, blogs, wiki, chat room, twitter) as well as collaborating and networking.</p>
<p>Analyzing</p> <p>Comparing, organizing, deconstructing, interrogating, structuring</p>	<p>Surveying/polling, using databases, relationship mind maps, online SWOT analysis, reporting (online charts, graphing, presentation or web publishing), mashing, meta-tagging.</p>
<p>Applying</p> <p>Implementing, carrying out, using, executing, editing</p>	<p>Simulation games or tasks, editing or developing shared documents (wiki, video and sound tools), interviews (e.g., making podcast), presentation or demonstration tasks (using web conferencing or online presentation tools), illustration (using online graphic, creative tools).</p>
<p>Understanding</p> <p>Interpreting, summarizing, paraphrasing, classifying, explaining, comparing</p>	<p>Building mind maps, blog journaling, wiki (simple page construction), categorizing and tagging, advanced internet (Boolean) searches, tagging with comments or annotations, discussion forums, show and tell (with audio, video webcasting).</p>
<p>Remembering</p> <p>Recognizing, listing, describing, identifying, retrieving, naming, locating</p>	<p>Simple mind maps, flash cards, online quizzes, basic internet searches (fact finding, defining), social bookmarking, Q & A discussion forums, chat, presentations.</p>
<p>Source: Adapted from Churches, 2008; retrieved http://www.scribd.com/doc/8000050/Blooms-Digital-Taxonomy-v212</p>	

Figure (8) Types of blended learning activities

5. Learning Activity Management System

LAMS is an innovative tool for designing, managing and delivering online learning activities. It provides teachers with a user-friendly ‘authoring’ environment for creating sequences of learning activities. These activities can include a range of individual tasks, small group work and whole class activities based on both content and collaboration. There are also real-time student monitoring and tracking facilities.

LAMS allows a teacher to create a learning design or “digital lesson plan” that can be run online with students, as well as shared and adapted amongst colleagues/teachers. A learning design can be stored, re-used, and customized or adapted for other learning contexts or topics. A LAMS activity contains of a range of tools available within LAMS, such as:

- a) **Share Resources tool** – allows teachers to add content into a sequence, such as URL hyperlinks, zipped web sites, individual files (PDF, PowerPoint, Flash) and even complete learning objects;
- b) **Task list activity** – teacher allows authors to create a series of tasks which are marked off as completed by learners. Each individual task may be compulsory or not, or require the completion of other tasks to become available;
- c) **Q & A activity** – teachers pose a question/s to learners individually, and after they have entered their response, can see the responses of all their peers; there is also multiple-choice/true-false automated assessment and survey tools;
- d) **Google Maps** – teachers can create maps or satellite images with annotated place markers., and then as part of the activity, students can add their own markers to the map and view markers placed by other learners;
- e) **Pixlr** –image editor that has powerful image creation and editing features, and the interface will be familiar to anyone who has used Paint, or more advanced editors like Photoshop or GIMP.
- f) **Web 2.0 Technologies** Many of the tools described above are considered Web 2.0 technologies. These are web applications that facilitate interactive information sharing, collaboration and dialogue on the World Wide Web. These

tools offer a wide range of possibilities for blended learning beyond what a Learning Management System (LMS) such as Blackboard can provide teachers and students.

6. Supporting Students Learning Strategies

In designing activities that require student collaboration, it will be important for the teacher to be mindful of potential difficulties and issues that group work often entails, and to be ready to respond if these arise: to provide students with some guidelines and strategies for working successfully in groups, to be clear about the expectations regarding the group work right from the beginning; and then encourage the students to do the same by forming a set of “ground rules” to help guide their group.

a) Assessment

Good practice in assessment would tell us that ideally assessment tasks should be designed such that they are actually integral to the process of learning rather than only being about outcomes and grading. Blended learning offers a range of ways in which learning activities can be incorporated into the course assessment program.

Assessment in blended learning is needed to monitor student progress frequently and more easily and to motivate students to engage in learning in an ongoing manner by using online activities scheduled as part of the course curriculum. Assessment and learning objectives are intimately tied. One useful framework for considering both is Bloom’s Taxonomy (Bloom, 1956), a hierarchical classification of the different objectives that are typically set for students. In choosing blended learning approaches to assessment, it is important to revisit your consider the course learning objectives and what the students to demonstrate. Some questions to consider include:

- How will students use the knowledge and skills gained in the course in the real-world?
- what are the designed learning activities?
- What knowledge needs to be assessed?

On the other hand, designing assessment tasks to include peer and self-assessment has many advantages. It can provide feedback to individual students

beyond what might ordinarily be possible with large classes. It can have a much greater impact on student learning. It can foster higher-order thinking skills as students are required to consider criteria and standards and evaluate work against these, and can help to develop other generic skills such as communication, lifelong learning, and autonomy. It can also help to make assessment more authentic, and can motivate students as they have an “audience” for their work beyond the teacher.

Self and peer assessment can help to develop a sense of community amongst students, and forge a culture of collaborative learning. Students naturally compare their work with others; peer assessment processes can build on this to provide a supportive and open environment which is monitored and grounded in established criteria and standards.

Technology can assist in the management of peer and self-assessment, particularly when dealing with large numbers of students. For example a teacher can set up an assessment task for either self or peer assessment or both. The tool enables students to submit work and to evaluate according to set criteria. Of course, a teacher can include examples of model answers to support students in making their assessments, and can choose from a range of other options such as anonymity, number of markers per submission, etc. Feedback is then available to each student via the My Grades link. Moreover, *Student and Group Evaluation (SAGE)* tool – aims to provide a student with an easy tool to set up and manage the process of obtaining, collating, and sharing self and peer feedback regarding *group work*. It allows a student to design a range of different self and/or peer assessments in relation to group work.

b) Management

Effective and efficient management is vital for the success of any course and in managing your own workload. In a blended learning environment, this is particularly important because a teacher may not have regular face-to-face contact with all students to deal with any difficulties or issues. On the other hand, working in a blended learning environment can offer a range of strategies and tools to support the efficient and effective management of a course.

In a blended learning environment the course web site becomes a critical focus for communication, teaching, learning, collaboration and assessment. It is therefore important to have a well-managed site for the effective implementation of your course. Consider the following issues:

- i. Layout of the web site
 - a. a clear reason for including any material and its location
 - b. a clear and consistent rule for content areas;
 - c. Plan the structure and the organization of the web site.
- ii. Terminology
 - a. Avoid confusion by using terminology unfamiliar to student;
 - b. Be consistent in the use of terminology across all communications and in naming documents and resources;
- iii. Consistency
 - a. Consistency is the golden rule for designing a successful blended learning experience;
 - b. Check all elements for consistency (structure, location of similar resources, terminology);
 - c. Maintaining a degree of consistency will create cohesion, student familiarity and efficiency in navigating and locating materials on course sites.

c) Managing students

The use of technology in teaching is often associated with concerns relating to managing the rush of communication that might come from students as well as remaining in control of the learning and teaching process. One may consider that using technology as creating student autonomy, but it may be easy to get off-track in terms of learning and appropriate behavior. There are a number of strategies for managing students in a blended learning environment for Keeping students on track as follows:

- o Being clear about the “rules of engagement;

- Giving clear guidelines regarding what is required for each particular activity;
- Having a clear and definite structure for the course along with a clear rationale;
- Monitoring student participation and contacting inactive students.

Principles to Promote Excellence in Learning and Teaching which can help to guide the evaluation of a course. These principles are:

1. Create an *engaging, motivating*, and intellectually stimulating learning experience;
2. Encourage the spirit of *critical inquiry* and *creative innovation* informed by current research;
3. Emphasize the importance, relevance, and *integration of theory and knowledge with professional practice* to develop solutions to *real world issues*;
4. Provide learning *experiences* that develop *inter-culturally* capable graduates who can make a difference as *socially and ethically responsible* global citizens;
5. Value and recognize *individual and cultural diversity* through the provision of an inclusive context of support and respect for all students;
6. Enhance student engagement and learning through *effective curriculum design, pedagogy and assessment strategies*;
7. Continuously improve teaching practice through academic staff professional development, and critical reflection informed by a range of evaluation approaches.

7. Creative Learning

There is a call for innovation and creativity competences in education in fast changing knowledge society to understand how they are framed in learning objectives and applied in practice at primary and secondary level. There seems to be a widespread consensus on the definition of both of them, even if their application and interpretation differ. Sternberg & Lubart (1999) consider creativity as the

"ability to produce work that is both novel and appropriate". Innovation, on the other hand, has been considered as the "implementation of a new or significantly improved product (good or service), or process, or a new organizational method in workplace organization" (OECD, 2005). Craft (2005) defines creativity as the ability to see possibilities that others do not noticed, Esquivel (1995), moreover, defines creativity as the critical process involved in the generation of new ideas. West and Richards (1999) define innovation as the intentional introduction and application of ideas that are new to work to benefit the organization. Furthermore, Craft (2005) defines innovation as the implementation of new ideas to create something of value, proven through its uptake in marketplace. Hence, an innovation can be seen as a new idea being launched on the work for the first time".

Creativity and innovation are obviously inter-related. Creativity is seen as the infinite source of innovation, and innovation can be perceived as the application and implementation of creativity (Craft, 2005). Moreover, people recognize creativity without being able to define it. The concept of creativity has been used in several contexts by researchers and non-specialists alike. This extended use of the term has shaped a strong connotative value, for example creativity is often perceived as synonym for imagination and originality. Creativity would be seen as the domain of arts, if it is restricted to certain specific subjects. Although recognizing the relevance of the visual arts, music, drama and the like for a creative education, it should not be forgotten that all areas of knowledge, and all school subjects, can benefit from creativity.

7.1. Creative Process

The study of personality traits of creative and eminent people dealt with genuine research on creativity. In this field, there are several intellectual traits identified to constitute attributes that foster creativity, which can be found in eminent people and artists and which can indicate how creativity could manifest itself in ordinary people. There are two currents of thought: the first one assumes that creativity is a quality and attribute of eminent people; the second thought recognizes that creativity is an ability that the ordinary person can possess.

Creativity requires the simultaneous presence of a number of traits. Sternberg and Lubart (1999) argue that creativity requires six elements: intellectual abilities,

knowledge, specific styles of thinking, personality and motivation. Three intellectual abilities are very essential: creative or synthetic- the ability to see a problem in new ways-; analytic- considers ideas are worth pursuing-; and practical-contextual- persuading others of the value of one's ideas. Regarding the thinking style, they insist that creative people intend to look for novelty. They also claim that creative people are those who get low and generate high in the domain of ideas. Creative people invest their thought in ideas that seem to be unpopular and they make their creative input.

Albert and Runco (1999) believe that intelligence is the central individual characteristic of creative people. Runco (2007) suggests that the threshold theory suggests that there is a minimum level of intelligence required to be creative, but that not all intelligent people are creative.

Other studies conclude that intelligence is a necessary component of creativity but not sufficient (Heilman et al., 2003). Sharp (2004) distinguishes creativity from intelligence and talent. Moreover, the relationship between creativity and intelligence can be biased by what we understand by "intelligence". The term generally refers to linguistic and logical mathematical abilities, but it has been pointed out that these skills do not fully cover what intelligence is. Gardner (1983) identifies the existence of eight intelligences: linguistic; logical-mathematical; musical; bodily-kinaesthetic; spatial; interpersonal; intrapersonal; and naturalist. Everyone excels in one or two of these intelligences. Therefore, when establishing a threshold of intelligence, it should be specified which of these intelligences is being considered.

One can consider that the concept of intelligence is possibly as complex as that of creativity. Sternberg (1999) compares the two concepts as follows:

Relationship	Main point	Main authors or references
Creativity as a subset of intelligence	Guilford: creativity involves some aspects of intelligence, i.e. divergent thinking. Gardner (multiple intelligences): intelligences can be used in a variety of ways, including fostering creative outcomes.	(Guilford, 1950) (Gardner, 1983)

Intelligence as a subset of creativity	For cognitive processes, creative ability is required more than intellectual ability. Creativity necessitates and involves intelligence and other attributes; therefore intelligence is part of a complex and multi-faceted creative process.	Leon Smith (in Sternberg & O'Hara, 1999) (Sternberg & Lubart, 1993)
Creativity and intelligence as overlapping sets	Creativity and intelligence are similar in some ways, but different in others. Similarities include problem-solving abilities. Differences embrace logical attributes of intelligence opposed to illogical modes of thought for creativity.	IQ tests Implicit theories (Roe, 1976)
Creativity and intelligence as coincident sets	The mechanism underlying creativity are the same that are requested for intelligence. What is judged as creative is simply an extraordinary outcome of a process that involved intelligence.	(Weisberg, 1993)
Creativity and intelligence as disjointed sets	Creativity is not an ability but the result of constant and deliberate practice in a domain. In this view, intelligence has no impact on creative performance.	Anders Ericsson (in Sternberg, 1999b)

Consequently, the conclusion from Sternberg's review is that researchers haven't yet reached a consensus on the relationship between creativity and intelligence. This leaves the issue open, and there is a need to further investigate the field.

Russ (1996) considers creativity of three processes: i) personal traits (i.e. tolerance of ambiguity, openness to experience, independence of judgement, unconventional values, curiosity, preference for challenge and complexity, self-confidence, risk-taking, intrinsic motivation); ii) emotional or affective processes (i.e. affective fantasy in play, passionate involvement in tasks, affective pleasure in challenge, tolerance of anxiety) and; iii) cognitive abilities (i.e. divergent thinking, transformation abilities, sensitivity to problems, tendency to practice with alternative solutions, wide breadth of knowledge, insight ability and evaluative ability).

Weisberg (1999) considers the amount of knowledge required to be creative as a fundamental block of creativity. Based on previous studies fomented the assumption of an inverted U relationship between creativity and knowledge, little knowledge in one field would hinder creativity, as much as extreme field knowledge (Boden, 2001). However, Weisberg (1999) affirms that great mastery of a field is needed to come out with a creative breakthrough. He refers to the '10 year rule', as

several studies on eminent people claim that 10 years' of experience in a field is necessary to master the field, and then an additional 10 years to come up with something creative. Deliberate practice and knowledge in a given field positively contribute to creativity. Runco (2007) sustains this view by stating that creative people are recognizable by their work ethic and persistence.

Laske (1993) suggests the ambiguity and vagueness of creativity could reside in the fact that creativity is closely linked to a particular environment and culture. As creativity is culturally-bound, it is impossible to define or explain it and one could at best exemplify it. He believes that creativity is an axiological concept, that is based on personal judgement of value, not a scientific one. Creativity can be considered to be linked to the cultural domain in three different ways: first, the concept of creativity is context dependent and culturally shaped; second, ideas can only be judged to be creative against a background of previous practices; third, certain environments attract creative people and kindle or kill creative performances.

7.2. Creativity and Innovation in Education

Craft (2001) distinguishes two different trends in research on creativity and developed the concepts of "big C" and "little c creativity". The first (big C creativity or BCC) refers to the creativity of the genius, seen in people such as Einstein and Picasso. Their creative achievements are exemplary and comprise novelty and excellence in their domain, as well as social recognition and valuation. On the other hand, little c creativity (LCC) is not for the gifted and talented, it is the behavior and mental attitude to find new and effective solutions to everyday problems. LCC is not for an extraordinary few. Shneiderman (2000), on the other hand, differentiates between revolutionary creativity, imputable to Nobel laureates and geniuses, and evolutionary acts of creativity, which can include doctors making a diagnosis or an editor drafting a magazine.

There is a growing interest in the relevance of creativity for teaching and learning since the 1990's (Craft, 2005). Creativity and innovation in education are necessity trends. First, several emerging trends entail an alteration in the way young people learn and understand (Redecker, 2008). Teachers have to attract students' interest and attention in a new way, and as a result the development of creative approaches is called for (Simplicio, 2000). Secondly, the current and forthcoming

cohorts of learners are growing up surrounded by mobile phones and other digital media. This overwhelming spread of technologies brings a new understanding of communication, information retrieval and meaning-making. Pedró (2006) argues that the gap between the school and home digital environment is thus affecting learners' expectations where Selinger, Stewart-Weeks, Wynn, & Cevenini (2008) think that building up a perception of the current educational framework and format's inadequacy. Third, creativity has been seen as a form of knowledge creation (Craft, 2005). Based on the aforementioned reasons that creativity and innovation are unavoidable conditions for the present and future of education.

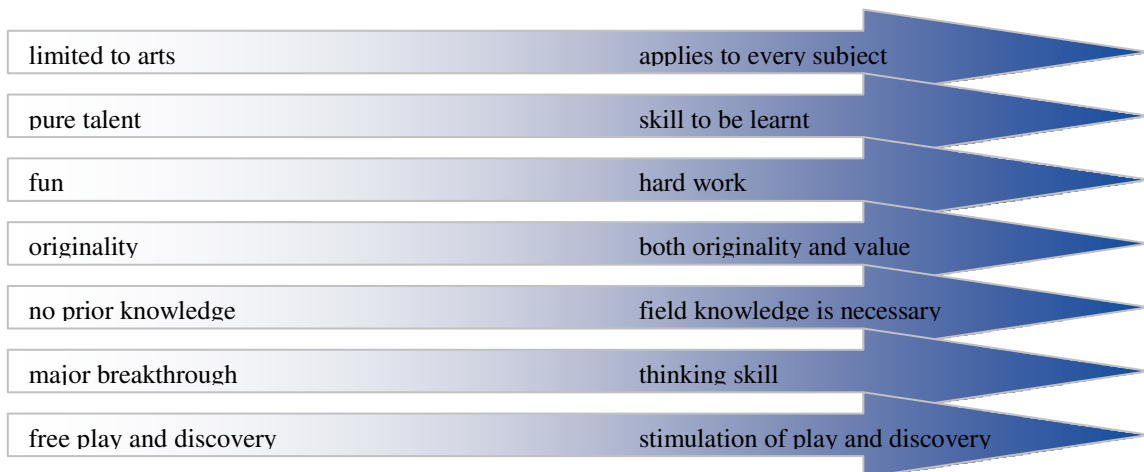
In formal education, the role of the learner dismisses some of the overlapping areas of creativity and innovation. This is mainly due to the current pedagogical methods. Learners are perceived as the end recipient of knowledge. Although they are the major stakeholders in education, their current power to actively contribute to institutional change is limited. Innovation is the implementation (OECD, 2005) or the intentional introduction and application (West & Richards, 1999) of a novelty which aims to ameliorate a particular situation. Teaching can be seen as the implementation of methods and pedagogies, and of curricula and contents. Teaching materials which address creativity and applies it to methods and contents can be seen as innovative teaching. In the meantime, the cognitive approach to creativity emphasizes its connection to knowledge and thinking skills, bridging the creativity process with learning. Hence, creative learning is the possibility for learners to develop their creative skills and to learn in a new creative way and innovative teaching is both the process of teaching for creativity and the application of innovation to teaching practices.

Creative learning and innovative teaching requires an understanding of the meaning of creativity for education and its implication. Beghetto (2005) points out that teachers might ask students to use their creativity, or might refer to a student's response as creative, without explaining what they mean. Hence, a lack of the definition might result in erroneous assumptions, leading teachers and students to identify creativity only with talent, the arts and personal characteristics. This entails a threefold procedure:

- 1) a de-construction of several current myths about creativity which are leading to a shared misunderstanding of the issue (Sharp, 2004);
- 2) a discussion and framing of the implications of "newness and value" in the educational context (Craft, 2005); and
- 3) an emphasis on the process instead of the product (Runco, 2003).

As Runco (1999) suggests teachers, parents and learners hold a tacit knowledge about creativity manifested in opinions and expectations, which are completely different with what research is exhibiting – and which can have detrimental effects on any attempts to foster creativity in schools. This tacit and shared knowledge builds up a series of "implicit theories", which account for how ordinary people think about creativity. These theories differ from the ones held and scientifically tested by researchers, *explicit theories*. The figure below shows a series of implicit theories as Sharp (2004) considers them – about creativity and the opposite findings of scientific research. The model presented is an elaboration of Sharp (2004); Beghetto (2007) and Runco (1999). Understanding creativity means addressing these issues and being aware of the potential of everyone to become creative.

Creativity for Education



8. Implicit Versus Explicit Theories of Creativity

There is a link between creativity, intelligence and knowledge in educational contexts. The connection between creativity and learning will also be discussed as follows:

a) Intelligence

Among the contrasting findings about the link between creativity and intelligence, the threshold theory seems to be highly questionable. This theory supposes the existence of a threshold for the intelligence required to be creative (Runco, 2007). Following this theory, it would be easy to assume that focusing on creativity in the classroom would leave out a small portion of those students whose intelligence falls below the threshold. As Runco (2007) points out that the threshold refers to traditional intelligence, which is often associated with academic performance and linguistic/logical fluency or knowledge. In this case, people performing below the threshold have lower knowledge and experience, what Runco calls an *experiential bias*. As a consequence, it could be argued that, if there is a threshold for creative performance, effort should be made to allow every learner to raise their level of intelligence, knowledge and experience above the threshold.

b) Knowledge

Guilford (1950) had recognized the centrality of knowledge for creativity. Knowledge seems to be a necessary, but not sufficient, condition for creativity (Boden, 2001; Weisberg, 1999). It is unclear how knowledge shapes creative outputs, as research findings seem to be contradictory, stating on the one hand that extreme expertise will hinder creative outcomes (Simonton, 1990) and on the other that there is no limit to the amount of knowledge needed to be creative (Weisberg, 1999). Knowledge and expertise are unquestionable attributes of the creative eminent mind, regardless of the debate about the amount and the kind of knowledge needed (Scott, 1999).

As regards LCC ("little c" creativity) and education, the kind of background knowledge needed by learners assumes a different nuance. Students require first of all a know-how of creativity, i.e. knowing how to think and how to perceive things in a different way, or how to make connections. During the time of formal learning knowledge becomes more important and the kind of knowledge needed is incremental from pre-school to university.

Boden (2001) distinguishes three types of creativity, each of them involving a different kind of knowledge-acquisition. *Exploratory creativity* entails the

investigation of a given space or field. This requires some specific and technical knowledge, and it can be said that the creative exploration of the field fosters knowledge acquisition. The second type of creativity is what Boden calls *combinational creativity*, which involves the production of new ideas by combining or associating old ones in new unfamiliar ones. The field knowledge here is as necessary as the ability to make connections between stored information. Finally, *transformational creativity* is the significant alteration of one or more of the rules of the conceptual space. Transformational creativity enables the generation of ideas that could not have been thought of before. This kind of creativity is often seen in geniuses and requires a substantial amount of knowledge, as well as self-discipline. Transformational creativity may happen when an individual thinks about a concept in a completely new way that alters his previous understanding of the subject or field. It could be an epiphany regardless of the fact that society already concluded with the same conclusions.

All three types of creativity identified by Boden presuppose specific knowledge acquisition, be it subject knowledge, awareness of creative method and approaches, or know-how of both subject-matter and creative attitudes. Knowledge is of substantial importance to trigger a creative outcome; but the reverse is also true. Creativity allows for the making of connections across different areas of knowledge (Burke, 2007). Learners need to be trained and taught how to make connections and to build on previous understanding. In turn, this scaffolding allows an expansion of knowledge. The relationship between creativity and knowledge could therefore be seen as a virtuous circle, where creativity stimulates knowledge acquisition and new knowledge permits new and creative thinking paths. In addition, building a creative bridge between different domains results in a holistic approach to knowledge.

c) Learning

Craft (2005) and Runco (2003) support the argument that creativity and knowledge are interdependent and the reference for the originality and value pillars leads to an assumption of creativity as a model of understanding and of knowledge creation. Runco (2003) argues that creativity as the construction of

personal meaning and Craft (2005) views creativity as a form of knowledge creation.

Learning in a creative manner is a form of meaning-making. Current pedagogical discourses attempt to view learners as the center of teaching and learning processes, with an active role in the production of knowledge and meaning, bringing their expertise, experiences and ideas into the classroom (Williamson & Payton, 2009). Moreover, constructivist approaches to learning involve understanding and making new and valuable connections between old and new knowledge. As Piaget (1973) had claimed that *to understand is to invent*. Without invention, learning results in merely memorization and teaching as a consequence can be viewed as nothing more than imparting notions. Understanding is a form of meaning creation – just as creativity is. Therefore, creativity is an aspect of learning (Craft, 2005). Non-creative learning, on the other hand, comprises all learning that favors memorization over understanding; rote-learning and learning of facts. Both creative and non-creative learning are important for education and should co-exist. It is unavoidable to go through a certain amount of non-creative learning before being able to make any new connection or to embark on understanding a topic. At the same time, non-creative learning is not enough, as understanding is fundamental for the cognitive and cultural development of children and young people.

A conceptualization of learning and creativity as *overlapping sets* that lead to a perception of creative teaching as a form of skillful teaching (Craft, 2005). Thus, creativity is not only desirable but also necessary because it involves co-construction of meaning and the learner taking an active role. Creativity enhances learning and makes teaching more effective.

9. Innovation as a Paradigm Shift

There is a growing desire for a holistic transformation of educational systems (Selinger et al., 2008). Educationalists see how creativity can benefit learning. Creativity allows for the possibility of making connections across different areas of knowledge; there is thus a need for innovative spaces that allow

for this cross-cultural and multi-disciplinary approach, which can also include informal knowledge. This approach will thus challenge the actual, traditional configuration of school space, time and structure (Burke, 2007).

Schools are considered to be resistant to change. As Williamson and Payton (2009) point out that any kind of educational change is challenging then it becomes messy and slow. Schools, in particular, face an enormous challenge, as there is a pressure to achieve in different areas and as new requirements do not shade or substitute old ones (Christensen et al., 2008). Moreover, it is quite unlikely that an institution can provide disruptive change. By disruptive innovation, Christensen et al. (2008) mean a kind of innovation that is not only preoccupied with the improvement of an existing product (which is called incremental innovation); but which radically changes the paradigms and principles of the product. For example, the appearance of personal computer. Old computers were big, expensive machines that only experts could use. Sustainable innovation made newer, faster, bigger computers. The advent of the personal computer changed the market, as the product was not as sophisticated as big computers were, but it targeted another type of client (a previous "non-consumer"). So the introduction of personal computers is a disruptive innovation because it changes the "idea", market and target of computers, even though its base level was not as powerful as the big traditional computers (Christensen et al., 2008). Hargreaves (2003) maintains that the idea that lies behind disruptive innovation is the opposite to that of sustainable innovation.

Schools do not seem to possess the characteristics of innovative organizations, which are generally flexible, welcome ideas, are empowering, tolerate risk, celebrate success, foster synergy and encourage fun (Craft, 2005). Even the implementation of technology in education has not made the foreseen change: ICT has not had the transformative impact it could have had and which was expected (Ala-Mutka, Punie, & Redecker, 2008b). According to Christensen et al. (2008), this is because teachers have used computers to sustain their existing practices, as displacing them would require a kind of disruptive innovation that is not yet feasible. If there is a desire to change education, all educationalists should be involved and must work towards the same goals. Moreover, it is necessary to promote creativity at all levels, as creativity can contribute to both

sustainable and disruptive innovation. Innovation cannot happen without creativity.

True innovation in education will require a complete shift in format and methodology (Simplicio, 2000). This will entail a constant and total renovation, regardless of previous effectiveness. The main actors of change are teachers (Redecker, 2008), but without institutional support they could not only kindle but also kill creativity and innovation. They are the first and most effective source of creativity for learners (Esquivel, 1995), therefore they need both the support and the resources to innovate. Teachers tend to settle in and become comfortable in their profession (Simplicio, 2000). However, teaching careers can last for forty years, and it seems unthinkable to expect that several generations of students would benefit from the same approach (Pedró, 2006). Teachers who wish to be creative have to be willing to change their approach and method (Simplicio, 2000). Teaching creatively and for creativity is not about adding a few new photos or figures. Educators run the risk of falling into the originality pitfall, believing that creativity is a synonym of originality (Beghetto, 2007a). Innovating education involves a complete change in the content and method of teaching, and also in assessment (Simplicio, 2000).

Technology can help to bring about change (Christensen et al., 2008). The development and implementation of student-centric technology will bring a need to shift to student-centered pedagogy and the ownership of learning by learners, a quality that is indispensable for fostering creativity (Woods, 2002). Students could learn with software that is developed for their kind of intelligence and learning style (Christensen et al., 2008). In this way, teachers will not be instructors anymore but rather facilitators (Burke, 2007).

Moreover, innovation in education would be the establishment of a network of teachers to disseminate good practice (Hargreaves, 2003). Schools are a good repository of expertise and variety; teachers have therefore to be encouraged to share their expertise through the observation of other teachers within and outside their school (Simplicio, 2000). Also, the establishment of an institutional virtual network of expertise, where teachers could exchange resources and tips is a fruitful source of expertise (Hargreaves, 2003). Hence, technologies are fundamental for this kind of

transformation, as ICT can be an effective and affordable means of peer-to-peer exchange and networking.

10. Educational Culture for Creativity

Creativity and knowledge acquisition can overlap. Teachers' preferences for students' responses suggests that classroom discussion would be the ideal time for the promotion of creative thinking skills (Beghetto, 2007). De Bono (1970) wrote a textbook to be used in classrooms presenting various techniques to develop thinking skills during classroom interactions. On contrary, as Beghetto (2007) shows that there is a tendency among teachers to prefer standard answers to unique ones; as actual teaching culture does not value creative answers. He also found out as a delicate balance between relevance and newness. Teachers place great emphasis on relevance, competence and the need to avoid mistakes – thus hindering the possibility to develop creative skills.

In schools, newness is dismissed for the sake of contextual relevance. There is a need for a paradigm shift, in order to accept new ideas into the classroom. Beghetto (2007) draws out attention that mathematics secondary school prospective teachers held relevance as most important. One of the personality traits of creative people is their capacity to take risks (Davies, 1999), this quality is certainly hindered in a school environment, where the correct, standardized answer is the desired response.

Runco (1999) argues that teachers prefer learners who have characteristics that are in sharp contrast with creative personality traits, such as "conforming" and "considerate". Moreover, Ng and Smith (2004) come to the same conclusion: teachers dislike personality traits associated with creativity. The more creative a class becomes, the less desirable their behavior appears to teachers, as on the one hand, Ng and Smith maintain, a creative teacher loses an aura of authority, and on the other, creative behavior in students is often perceived by teachers as associated with scepticism and egoistic manners. Similarly, Westby and Dawson (1995) confirmed teachers' negative view of characteristics associated with creativity in students. On the other hand, (Milgram, 1990) conducted a research on how learners value creativity, 500 students were asked what they valued more in teachers, and

creativity came out as one of the most valued items. Moreover, in her study she found that creativity was linked to teachers' effectiveness.

Craft (2005) argues that teaching for creativity requires the teachers to be creative themselves and to provide learners with an ethos and a culture that values creativity. (Runco, (2007) believes that for creative teaching implies a change of the system of values of creativity, where teachers manifest that creativity is worth pursuing. This should reflect a shift in pedagogy, moving towards an inclusive approach (Craft, 2005), where the environment is permissive and safe (Runco, 2007) and where learners are in control of their learning process (Woods, 2002). Developing creative learning therefore demands innovative teaching.

11. The Importance of the Teacher Role

Milgram (1990) contends that effective teachers are often compared to creative teachers. Simplicio (2000) identifies a number of sources that creative and effective teachers rely on include ICT, but also realia, manipulatives and innovative resources. They generally do not restrain their lessons to textbooks.

Wyse and Spendlove (2007), Beghetto (2005), Craft (2005), Sharp (2004) and Ng and Smith (2004) point out that teachers play an important role in triggering students' creativity. Teachers are key components and builders of a creative climate conducive to creative learning. They provide the balance between structure and freedom of expression and determine the triggering of students' creative output. They are the ultimate source of creativity and innovation: no matter how good policies are, they rely on teachers to implement them in class. Teachers should allow the co-construction of knowledge as being reflective practitioners, supporters and facilitators.

Woods (2002) considers innovative teachers fostering students' independence and empower them. Amabile (1989) stresses the importance of a nurturing environment to kindle the creative spark, an environment where students feels rewarded, are active learners, have a sense of ownership, and can freely discuss their problems; where teachers are coaches and promote cooperative learning methods, thus making learning relevant to life experiences.

Simplicio (2000) and Craft (2005) believe that teaching for creativity implies allowing pupils to take responsibility for their own learning. Students should not to be considered as receivers of information, it is important that they assume the role of discovery, but support and guidance are needed in order for them to succeed. Hence, teachers need to be prepared both on the pedagogical side to foster autonomy and student-centeredness, and on the subject-knowledge side. Lack of preparation will prevent teachers from being willing and ready to provide a learning format which allows students to discover and explore.

The importance of the role of the teacher for creativity and innovation in education puts more pressure on teachers to focus on several priorities and educational agendas at the same time. Beghetto (2005), Sharp (2004) and Christensen et al. (2008) identify a number of expected duties namely to cover the curriculum, meet standards, administer assessment in multiple forms, focus on literacy and numeracy or on the current governmental priority. They must perform all this while being creative and applying innovative, effective and entertaining teaching methods and including the implementation of ICT.

Craft (2005) continues emphasizing that teachers are asked to be creative and innovative and while they feel the pressure to achieve standards, tasks, duties and demands already assigned by policymakers. Implementing creativity in education is particularly challenging because the control over teachers' pedagogies and learners' performances is higher than a creative environment could withstand. Creativity needs time, interaction, and risk-taking such behaviors are attitudes that go against traditional school principles. Christensen et al., (2008) differentiate that schools mandate standardization where creativity requires uniqueness.

As a consequence, Craft (2005) and Simplicio (2000) recommend that teachers need to be given clear and not conflicting priorities. Moreover, policies should offer a balance between freedom and control, and should provide enough time to teachers and students to internalize and experiment. In the meantime, teachers should be trained to implement continual professional development, as the needs of learners change at a fast pace.

11.1. School and Instructional Models

Educational leaders should lead conversations that determine the best model or portfolio of models for their school community. Educational leaders need to help the community weigh the pros and cons of different online options and devices and find ways to extend the reach of the most effective teachers and build support systems for teachers that need support. Blended learning models intentionally integrate technology to boost learning and leverage talent.

There are two primary types of blended learning models: rotation and flex. Students in rotation models transition from face-to-face instruction to online learning in classroom centers or a computer lab. Rotation models are common at the elementary level. Flex schools have a digital curriculum that may be supplanted with projects, tutoring, and small-group instruction. Students often work independently and move at their own speed. Flex models are most common in high schools.

11.2. Innovative Role of Teachers

Literature and research suggest that technology is endowed with a potential to innovate education (Blandow & Dyrenfurth, 1994; Ruiz i Tarrago, 1993). However, teachers need to modify their teaching methods to accommodate the changed interaction patterns. The effective use of new technologies requires innovative teaching skills. When students are not provided with adequate understanding of the affordances of technologies, there is a high probability that they will replicate familiar forms and ideas using the new tools, as opposed to using the new tools to explore new connections and different ways of fashioning (Loveless, 2008). A study conducted in primary schools on how students used online tools to communicate and participate in online communities highlights the same point (Turvey, 2006). Despite relative autonomy in virtual spaces, most children did not attempt to experiment with the potential of the tools but rather followed predictable patterns of behaviour. This shows that provision of creative spaces and freedom for exploration does not necessarily lead to *creative learning*. The role of the teacher within and outside virtual spaces is important in teaching students how to be creative and innovative.

Teachers' proficiency in using technology is another issue (Shaffer, 2006). In order for innovative teaching to take place, teachers need to be aware of the available resources and how such resources may be useful. Teachers also need to

be able to identify creative processes when they take place. These teachers may thus leverage on their technical knowledge and try to integrate new ways of teaching using their students' technology. Another example could be integrating the downloading of e-books in classrooms or sharing school resources for a language class.

Teachers nowadays recognize that a new generation of computer literate learners demand 'sophisticated e-learning resources' and 'support from their instructors' (Wang, Huang, Jeng, & Wang, 2008). However, it is not always clear how teachers should integrate technology in their teaching. Bottino (2003) argues that the lack of technical personnel to help teachers manage laboratories, as well as the fact that teachers are often not compensated for the extra-time needed to integrate ICT in their teaching, are some challenges and limits imposed by school systems with an ever increasing number of subjects.

In the educational context, networking could enable people to develop collaborative forms of learning. However, most school systems are still based on transmissive models. Within such systems, the role of the teacher is fundamental, if creative learning is to take place. Other challenges for teachers are team teaching on the internet and taking ownership and group leadership amongst the students/learners and new aesthetic norms and standards for learning projects (Borgnakke, 2006). This indicates the fact that ICT training for teachers is an important step in making education how it should be today. Teacher training, learning digital competence within context and innovative learning approaches have indeed been highlighted as enablers for pedagogical innovation in the context of ICT.

Baek (2008) gives an example of Korean schools to show that there are six factors which hinder teachers from using games in their teaching, namely: inflexibility of curriculum; negative effects of gaming; students' lack of readiness; lack of supporting materials; fixed class schedules and limited budget. An conclusion of this study is the difficulty encountered by teachers in aligning games with the curricula (Wastiau et al., 2009). These studies also mention the difficulties in locating useful educational games and parents' concern about the usefulness of games in the context of education. In this context, these limitations must be discussed because they could also be hindering innovative teaching.

11.3. Enabling Innovative Teaching and Creative Learning

There is a gap between policies and practices. A support mechanism is needed to facilitate the implementation of policies. This also applies to the discourse of creativity and innovation in education. If a ministry of education promotes creativity and innovation in its educational policies, this does not guarantee that schools will show creativity and innovation in their day to day practices.

One of the barriers to creativity and innovation in schools consists of teachers' overloaded schedules. The demand for creative learning and innovative teaching from policy-makers has to be matched with a support mechanism. Educationalists should be provided with policies and tools that help them all to pursue creative and innovative paths. Besides, policies for creativity and innovation in education need to be in line with other policies and with what is demanded from teachers and students. The promotion of creativity and innovation needs to be articulate and coherent, as the issue is complex and multi-faceted. Moreover, policies need to be mirrored by practices, for instance by establishing a nurturing school culture or by finding support in the availability of certain tools, in order to be applied in an effective way and to have a positive impact.

It becomes evident therefore that looking for creativity and innovation is challenging for several reasons:

- i. Creativity and innovation are processes do not have clear tangible outcomes and hence it is difficult to find evidence of them;
- ii. Creativity and innovation are exposed to subjectivity, arbitrariness and interpretation; thus making it challenging to compare data;
- iii. Policies are not necessarily mirrored in practice: encouraging creativity and innovation in policies is not enough, as there is a need for a support mechanism.

The fostering of creativity and innovation does not uniquely rely on the intention of educators and pupils, as there are several conditions to be met before a creative and innovative environment can be promoted. In this sense, policies and common practices may provide the circumstances for creative learning and

innovative teaching or, on the contrary, obstruct them. It is therefore interesting and necessary to examine which conditions can trigger creative learning and innovative teaching in order to support and allow them to spread.

By "enablers" individuals understand the circumstances or the support mechanisms that allow creative learning and innovative teaching to emerge or that facilitate creativity and innovation. As "multiple components must converge for creativity to occur" (Sternberg & Lubart, 1999), it is necessary to "prepare the ground" for creativity and allow for these components (or enablers), to convene. If all enablers are present, it is still not possible to deduce that creativity and innovation are happening, as it ultimately relies on the teachers and students to actively engage in the creative and innovative process. At the same time, if several conditions do not convene, it is unlikely that creativity and innovation will flourish. Enablers are therefore a measure of the possibilities for creativity and innovation, and not of the creative learning and innovative teaching that is actually happening in schools. The gathering, clustering and validation of enablers can have interesting spill-over effects for policy-making: enablers are the conditions and the support mechanism that facilitate and assist creative learning and innovative teaching. They should therefore be taken into account in order to develop educational policies effectively and coherently promoting and supporting creativity and innovation in education. Enablers are divided into eight major areas, presented in alphabetical order: Assessment; Culture; Curriculum; Individual skills; Teaching and learning format; Teachers; Technology; Tools.

These areas are wide and loosely defined, in order to allow a variety of conditions to fit under the same domain of concern. All areas have several sub-categories they refer to, in order to specify and detail the conditions for creative learning and innovative teaching. Each area is presented through a table that summarizes all sub-categories and links them to the main references.

12. The Implication of Creativity and Innovation in Education:

- a) Creativity and innovation can play an important role in the knowledge society, as the fruitful interdisciplinary;

- b) Creativity is conceptualized as a skill for all. It is an ability that everyone can develop and be fostered;
- c) *Creativity* has been defined as a product or process that shows a balance of originality and value. It is a skill, an ability to make unforeseen connections and to generate new and appropriate ideas.
- d) *Creative learning* is any learning which involves understanding and new awareness, which allows the learner to go beyond notional acquisition, and focuses on thinking skills. It is based on learner empowerment and centeredness. The creative experience is seen as opposite to the reproductive experience. *Innovation* is the application of such a process or product in order to benefit a domain or field - in this case, teaching. Therefore, *innovative teaching* is the process leading to creative learning, the implementation of new methods, tools and contents which could benefit learners and their creative potential.
- e) Educational actors need to have a clear vision, awareness and understanding of what creativity is and entails in order to fully comprehend how it can be enhanced. Judging the originality and value of an output entails seeing creativity as a relative attribute. Moreover, creativity in education has more to do with the process than with the product, and focuses therefore on the development of thinking and cognitive skills.
- f) Creativity and innovation have strong links with *knowledge* and *learning*. While intelligence does not seem to be a precondition for creativity, research shows the relevance of previous knowledge, both in terms of knowing how to be creative and of domain knowledge. Furthermore, creativity is seen by many researchers as a form of knowledge creation and of construction of personal meaning: it is therefore an essential skill for enhancing the learning process. *Creative learning* can be seen as a form of learning that favors understanding over memorization. Hence any learning that does not imply mere content acquisition entails a component of creativity.

- g) Creative learning requires *innovative teaching*. Innovative teaching is both the practice of teaching for creativity and of applying innovation to teaching. Both aspects call for an educational culture which values creativity and sees it as an asset in the classroom. Teachers are key figures in constructing a creative climate, but they need support from both policy-makers and institutions. In particular, curricula and assessment are key areas to be addressed in order to allow creativity in the classroom. Curricula should undergo a skillful and thorough development, giving the same importance to every subject, taking creativity into consideration and defining it coherently throughout the curriculum, allowing freedom and time for discovery, and taking learners' interests into account. Assessment should also allow creativity to flourish by valuing it, both at micro, everyday level and at macro, exam level. The three functions of assessment (diagnostic, formative and summative) must contribute to the development of both knowledge acquisition and skills development for learning and creating.
- h) *Technologies* play a crucial role in learners' lives and can enable educational change towards an innovative and creative school environment. They could act as a platform to foster creative learning and innovative teaching and are currently offering a variety of opportunities for constructive change. However, access to technology is not enough. Accordingly, this report argues that both teachers and learners must acquire the critical skills in their use of technologies to be able to benefit from them in an effective, innovative and creative way. Educational systems should also take into account the empowerment culture brought about by new technologies, putting the learner at the centre of the learning process. Otherwise, there is the risk that education policies and systems become irrelevant for students' real and future needs.
- i) There are other factors, alongside technologies, that support creative learning and innovative teaching. These are: assessment; culture; curriculum; individual skills; teaching and learning format; teachers; technology, tools. The co-existence of several of these factors would give rise to an enabling environment where creative learning and innovative

teaching could blossom. If enablers are not present, creativity will be less likely to flourish. If, on the other hand, all enablers are in place, it is still not possible to deduce that creativity and innovation are happening, as teachers and students will still have to actively engage in the creative and innovative process. Enablers are therefore indicators of the kind of environment which could nourish creative learning and innovative teaching.

We can sum up with the understanding that creativity and innovation are interrelated concepts; the first refers to a product or process which shows a balance of originality and value, and the second to the implementation of such a process or product in a given sphere. The notion of creativity has been researched in various fields and approached in several ways. Creativity can be linked to different factors, residing both in the individual (cognitive abilities, thinking skills, personality traits, knowledge), and in the surrounding sphere (culture, environment, field and domain). Creativity can be linked to cognitive and thinking processes as much as to emotional states, such as intrinsic motivation and affective learning processes. To sum up, all the theories studied indicate that creativity is context dependent, and arises in the interplay of a number of factors and requisites which can be supported and/or suppressed.

Creativity and innovation are interrelated but it has also proposed a differentiated approach for the field of education in which creativity is more strongly linked to learning, and innovation to teaching, hence the notions of *creative learning* and *innovative teaching*. Research indicates that, for a multitude of reasons, creativity is currently not at the center of education practices. This suggests that there is a need for a change in pedagogy towards a more permissive environment which cherishes students' ideas, encourages risk-taking and mistakes, and allows learners to assume ownership of their learning.

Creativity and innovation in education are not just an opportunity, but a necessity. This work highlights an inclusive perspective of creativity which sees all people as capable of being creative from early childhood. However, whether people develop their creativity depends on the kind of training they receive. Accordingly, creativity should be understood as a skill which may be developed through creative learning and innovative teaching.

The rapid development of technology has a significant impact on education. The new emergence of social computing applications allows for personalization of learning paths, making learning opportunities tailored to the individual's needs a reality. New digital formats employing a variety of media tools open up new sources and resources for creative expression. Collaboration and networking services offer further opportunities to develop creative ideas in cooperation with others. Hence, both creativity and ICT require the re-definition of the role of the teachers as enablers, motivators, mentors and coaches of learning processes that are essentially owned and controlled by the learners themselves.

13. Learning Styles

This approach to learning emphasizes the fact that individuals perceive and process information in very different ways. The learning styles theory implies that how much individuals learn has more to do with whether the educational experience is geared toward their particular style of learning than whether or not they are "smart." In fact, educators should not ask, "Is this student smart?" but rather "How is this student smart?"

The concept of learning styles is rooted in the classification of psychological types. The learning styles theory is based on research demonstrating that, as the result of heredity, upbringing, and current environmental demands, different individuals have a tendency to both perceive and process information differently. The different ways of doing so are generally classified as:

- a) **Concrete and abstract perceivers**—Concrete perceivers absorb information through direct experience, by doing, acting, sensing, and feeling. Abstract perceivers, however, take in information through analysis, observation, and thinking.
- b) **Active and reflective processors**—Active processors make sense of an experience by immediately using the new information. Reflective processors make sense of an experience by reflecting on and thinking about it.

Traditional schooling tends to favor abstract perceiving and reflective processing. Other kinds of learning aren't rewarded and reflected in curriculum, instruction, and assessment nearly as much.

13.1. Situated Learning Theory and Community of Practice

Situated learning theory” and “community of practice” draw many of the ideas of the learning theories considered above. They are developed by Jean Lave and Etienne Wenger (1991). Situated learning theory recognizes that there is no learning which is not situated, and emphasizes the relational and negotiated character of knowledge and learning as well as the engaged nature of learning activity for the individuals involved. According to the theory, it is within communities that learning occurs most effectively. Interactions taking place within a community of practice – e.g. cooperation, problem solving, building trust, understanding and relations – have the potential to foster community social capital that enhances the community members’ wellbeing. Thomas Sergiovanni reinforces the idea that learning is most effective when it takes place in communities. He argues that academic and social outcomes will improve only when classrooms become learning communities, and teaching becomes learner-centered. Communities of practice are of course not confined to schools but cover other settings such as workplace and organizations. This approach views learning as an act of membership in a “community of practice.” The theory seeks to understand both the structure of communities and how learning occurs in them. Communities of practice is based on the following assumptions: (i) *Learning is fundamentally a social phenomenon*. People organize their learning around the social communities to which they belong. Therefore, schools are only powerful learning environments for students whose social communities coincide with that school; (ii) *Knowledge is integrated in the life of communities that share values, beliefs, languages, and ways of doing things*. These are called communities of practice. Real knowledge is integrated in the doing, social relations, and expertise of these communities.

The processes of learning and membership in a community of practice are inseparable. Because learning is intertwined with community membership, it is what lets us belong to and adjust our status in the group. As we change our learning, our identity—and our relationship to the group—changes. *Knowledge is inseparable from practice*. It is not possible to know without doing. By doing, we learn. *Empowerment—or the ability to contribute to a community—creates the potential for*

learning. Circumstances in which we engage in real action that has consequences for both our community and us create the most powerful learning environments.

This approach to learning suggests teachers understand their students' communities of practice and acknowledge the learning students do in such communities. The communities of practice theory also suggests educators structure learning opportunities that embed knowledge in both work practices and social relations—for example, apprenticeships, school-based learning, service learning, and so on. Plus, educators should create opportunities for students to solve real problems with adults, in real learning situations.

13.2. 21st Century Learning Skills

Exploration of 21st century learning skills have emerged from the concern about transforming the goals and daily practice of learning to meet the new demands of the 21st century, which is characterized as knowledge- and technologically driven. The current discussion about 21st century skills leads classrooms and other learning environments to encourage the development of core subject knowledge as well as new media literacies, critical and systems thinking, interpersonal and self-directional skills. For example, the Partnership for 21st Century Skills defines the following as key: core subjects (e.g. English, math, geography, history, civics) and 21st century themes (global awareness, civic literacy, health literacy, environmental literacy, financial, business and entrepreneurial literacy); learning and innovation skills (creativity and innovation, critical thinking and problem solving, communication and collaboration); information, media and technology skills (e.g. ICT literacy, media literacy); and life and career skills (flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility). One main learning method that supports the learning of such skills and knowledge is group learning or thematic projects, which involves an inquiry-based collaborative work that addresses real-world issues and questions.

14. Impact of Learning Theories on Learning

14.1. Curriculum

Constructivism learning theory calls for the elimination of a standardized curriculum, it promotes using curricula customized to the students' prior knowledge and it emphasizes hands-on problem solving. Piaget's theory requires educators to plan a developmentally appropriate curriculum that enhances their students' logical and conceptual growth. Brain-Based Learning theory recommends that Teachers must design learning around student interests and make learning contextual. Learning Styles Theory requires that educators must place emphasis on intuition, feeling, sensing, and imagination, in addition to the traditional skills of analysis, reason, and sequential problem solving. Multiple Intelligences Learning theory suggests a more balanced curriculum that incorporates the arts, self-awareness, communication, and physical education instead of heavily concentration on the verbal-linguistic and logical-mathematical intelligences. Right-Brain vs. Left-Brain Thinking Learning theory recommend to pay full attention to the *whole-brained* activities in school orientation, schools need to give equal weight to the arts, creativity, and the skills of imagination and synthesis. Control Learning Theory suggests that teachers must negotiate both content and method with students. Students' basic needs literally help shape *how* and *what* they are taught. Observational Learning theory allow students to get a chance to observe and model the behavior that leads to a positive reinforcement. Vygotsky Learning theory considers children learn much through interaction, curricula should be designed to emphasize interaction between learners and learning tasks.

14.2. Instruction

Constructivism learning theory recommends that educators should focus on making connections between facts and fostering new understanding and to encourage students to analyze, interpret, and predict information. Teachers rely heavily on open-ended questions and promote extensive dialogue among students. Piaget's theory suggests that teachers must emphasize the critical role that experiences—or interactions with the surrounding environment—play in student learning. Brain-Based Learning theory requires that educators allow students to learn in teams and use peripheral learning. Learning Styles Theory requires teachers to design their instruction methods to connect with all four learning styles,

using various combinations of experience, reflection, conceptualization, and experimentation. Moreover, they can introduce a wide variety of experiential elements into the classroom, such as sound, music, visuals, movement, experience, and even talking. Multiple Intelligences Learning theory suggests that teachers should adopt instructional methods that appeal to all the intelligences, including role playing, musical performance, cooperative learning, reflection, visualization, storytelling. Right-Brain vs. Left-Brain Thinking Learning theory suggests that to foster a more whole-brained scholastic experience, teachers should use instruction techniques that connect with both sides of the brain. They can increase their classroom's right-brain learning activities by incorporating more patterning, metaphors, analogies, role-playing, visuals, and movement into their reading, calculation, and analytical activities. Control Learning Theory suggests that teachers should rely on cooperative, active learning techniques that enhance the power of the learners and lead teachers to make all activities meet the students' need satisfaction. Observational Learning theory supports a learned behavior often cannot be performed unless there is the right environment for it. Educators must provide the incentive and the supportive environment for the behavior to happen. Vygotsky Learning theory emphasizes that children can often perform tasks that they are incapable of completing on their own. With this in mind, scaffolding—where the adult continually adjusts the level of his or her help in response to the child's level of performance—is an effective form of teaching. Scaffolding not only produces immediate results, but also instills the skills necessary for independent problem solving in the future.

14.3. Assessment

Constructivism learning theory calls for the elimination of grades and standardized testing and it recommends that assessment becomes part of the learning process so that students play a larger role in judging their own progress. Brain-Based Learning theory considers that since all students are learning, their assessment should allow them to understand their own learning styles and preferences. Hence, students monitor and enhance their own learning process. Learning Styles Theory requires teachers to employ a variety of assessment techniques, focusing on the development of “whole brain” capacity and each of the

different learning styles. Multiple Intelligences Learning theory suggests that assessment methods should adopt the diversity of intelligences, as well as self-assessment tools that help students understand their intelligences. Right-Brain vs. Left-Brain Thinking Learning theory requires for a more accurate whole-brained evaluation of student learning, educators must develop new forms of assessment that honor right-brained talents and skills. Control Learning Theory suggests that teachers should grade their students' performance to certify quality of their work to satisfy students' needs, teachers grade students using an absolute standard, rather than a relative curve. Meanwhile, observational learning, social learning theory, occurs when an observer's behavior changes after viewing the behavior of a model. An observer's behavior can be affected by the positive or negative consequences. Vygotsky Learning theory emphasizes that assessment methods must take into account the zone of proximal development. What children can do on their own is their level of actual development and what they can do with help is their level of potential development. Two children might have the same level of actual development, but given the appropriate help from an adult, one might be able to solve many more problems than the other. Assessment methods must target both the level of actual development and the level of potential development.

15. Implications of Learning Theories on Knowledge Managements on Educational Organizations

Knowledge management leads educational organizations to identify all the needed processes that add value to learning experience, through the use of intellectual capital. Starting from the hypothesis that knowledge management and organizational learning are the link between the intellectual capital development and how these concepts are inter-related. Knowing is an integral part of broader changes of being, it is a way of participating and of relating.

In educational organizations knowledge management is considered as synthesizing the information processing technologies and the abilities of the people to allow the organization to survive on knowledge-economic base society. It is not just knowing everything the organization knows. It is creating a synthesis between the

people and the information to the point that the whole is the full picture of all parts. Hence, the value of knowledge management is the effectiveness with which the managed knowledge enables the teamwork to deal with the existing situations effectively. Organizations must challenge themselves to engage as many people as possible in the experiences, such that the organization learns to the depth and breadth that will sustain its growth in knowledge and ultimately its survival.

Knowledge management procedures enhance learning theories with different processes to capture and integrate newly gained knowledge into the existing one. In order to be successful, educational organizations must first concentrate on changing the mindset of its employees. The goal in using knowledge management is to aid them in the performance of their duties. It must have practical application to organizations – human organizations. Knowledge and learning come from people and their relationships with each other and their experiences. The real challenge comes in the form of developing a culture that embraces learning, sharing, changing, and improving, all through the collective intelligence and knowledge of people.

The organizations that learn how to be smart, quick and responsive are the ones that will survive long into the future. Organizations are made up of people who need time to experience, reflect and learn. Knowledge is derived out of human relationships and experiences. Hence, the assurance that knowledge will prevail by ensuring that knowledge workers are given "voice" – sometimes referred to as shared leadership. Knowledge workers as people who know more about what they are doing than their managers do while many knowledge workers have years of education and experience in training for their positions, they often have little training in how to effectively influence upper management. Sometimes, the great majority of people tend to focus on efforts rather than results. The answer lies not in focusing on efforts *or* results, but rather focusing on shared purpose. The responsibility for having "voice" within an organization does not necessarily rest with a perception of permission from upper management but with courageous followership. That shared leadership has its limits when given a top-down approach. Instead, that both the follower and leader share a common purpose and that the "loyalty of each is to the purpose and to helping each other stay true to that purpose something that can only be done holistically, by giving knowledge workers "voice" within the organization.

As discussed above, there are five areas of KM sharing knowledge

1. Systematic problem solving.
2. Experimentation with new approaches.
3. Learning from one's own experience and past history.
4. Learning from the experiences and best practices of others.
5. Transferring knowledge quickly and efficiently throughout the organization.

These five areas need to function in harmony and balance with one another. Effective knowledge management can be increased. The challenge facing the organization comes in maintaining the dynamic nature of the interrelationship of these five areas of knowledge management. These areas should be treated as a scientific method rather than on guesswork when it comes to problem solving. On decision making areas the treatment should be based on data, not assumptions. In the organization and communication, knowledge should use simple statistical tools.

Knowledge management can improve an organization's ability to achieve development results. In its most basic form, knowledge management is all about converting the available raw data into understandable information. This information is then placed in a reusable repository for the benefit of any future need based on similar kinds of experiences. Knowledge management contributes towards streamlining the ideas, problems, projects and deployment in light of organizational goals driving towards productivity.

Chapter IV

Knowledge Leadership

1. Introduction

In this chapter the researcher will present issues in regard of knowledge leadership. Two basic perspectives to be stated *a futuristic perspective* which conceptualizes individuals as agents of learning for the organization and the organization provides a positive learning culture and atmosphere for the individual and *an interpretive perspective* which is considered as a dominant paradigm. Organizational leadership considers knowledge as context dependent and learning is a social practice, taking place between individuals.

The three fundamental tasks of leaders will be presented *creating strategies*, *building a structure* and *building the capacity* of the members of the organization. These tasks are presented to identify the sources of weakness, strength and gaps of knowledge leadership. The information stated will be dealt with in the light of knowledge and economy, knowledge and employment and organizational culture and human resources. Policies will be presented to figure out the central role of the firms, the importance of national innovation systems and the requirements for infrastructures and incentives which encourage investments in research and training.

Indicators for the knowledge-based economy will be discussed to measure broad aggregates to guide the policy decisions of governments. Taking into consideration that current indicators may fail to capture fundamental aspects of economic performance. The short comings of meeting these indicators result in causing systematic obstacles to the creation of intellectual capital.

2. Knowledge Management Leadership

Leadership is an interaction between the leader and the team. Knowledge Management requires to invest that relationship to a deeper level of motivation (Trompenaars & Hampden-Turner, 2004). To effectively understand how to lead learning organizations the leader must understand what Garvin (1993) calls the three

M's "management, meaning, and measurement". Cummings *et al* argued that "*Leaders are idea brokers that enable the exchange of ideas to benefit their organization*" (Cummings *et al.*, 2004: p. 24). This exchange of ideas is part of meaning and measurement, the ability to procure new knowledge and then integrate that into the framework of the organization. The overall mission of a leader in the world of KM is to learn how to guide the internal marketplace within their organization. By doing this, the leader creates an organization that is a learning team dedicated to meaning, management, and measurement within KM.

Ortenblad (2002) suggests that there are two basic perspectives (i) a futuristic perspective which conceptualizes individuals as agents of learning for the organization; the organization provides a positive learning culture and atmosphere for the individual, (ii) an interpretive perspective which is considered as a dominant paradigm. Reality is seen as a subjective phenomenon; knowledge is viewed as context dependent; learning is a social practice, taking place between individuals; knowledge cannot be stored because it is determined by the situation.

To understand the meaning, management and measurement of learning organizations is a difficult task. The interpretive perspective places this task into the shifting sands of relativism and contextualization. Relativism makes measurement almost impossible because the norms are in constant flux. If the situation or context is the determining factor for knowledge, then learning is not based on the foundation of truth but on the environment. The implications of such a perspective are widespread including business ethics and cultural morality. The bandwagon of this popular paradigm should not be jumped upon too quickly.

One of the essential duties for leadership is the success of selecting a Chief Knowledge Officer (CKO) to fulfill the duties of knowledge management in the organization. The CKO is the organization's expert on knowledge management and integration. According to Bontis (2002), CKOs are responsible for:

1. Promoting stability in an ever-changing environment.
2. Provide the timely delivery of products/services.
3. Fostering organizational synergy by sharing resources and knowledge.

4. Ensure the feasibility of specialization.

In addition, in order for CKOs to be effective, they must understand how to implement technology is an enabler for capturing, storing, and sharing knowledge, as well as aligning it with the values of the organization. Therefore, leadership should find candidates for CKO who are enthusiastic, idealist, creative, resourceful.

As a leadership skill, knowledge, according to Northouse, "*is inextricably related to the application and implementation of problem-solving skills in organizations*", he argue that knowledge impacts a leader's ability to determine complex organizational problems and to develop a solution. "*Knowledge refers to the accumulation of information and the mental structures used to organize that information*" (Northouse (2004 : p. 43). This mental structure is called a schema to assimilate information into useable knowledge. Once a leader formulates information into knowledge, individuals are more inclined to follow based the leaders expertise. Greenberg and Baron (2003) contend that information power has become a lesser power due to technology and the availability of information to more people than ever before. Seniors no more holding knowledge for their benefit and allowing that information to be distributed only on a need-to-know basis.

Kluge et al. (2001) state that knowledge management presents unique leadership challenges. From a leadership perspective, knowledge management has been viewed more like a craft and less like a science. Because of the very nature of knowledge, "*it is difficult for managers to predict what measures can really improve performance, and how to encourage and guide knowledge flows within an organization*" (Kluge et al. 2001, : p. 191). Rosenburg (2004) suggests that if the senior leadership of an organization is not able to adopt and embrace a KM program, it is far more likely to fail than to succeed.

Bolt and Brassard (2004) identify characteristics of effective CEOs that support their learning and knowledge management as "*a desire to learn, an open and curious mind, show humility- willing to learn from their mistakes, make learning public, tolerate risk*". Moreover, McCollum (1998) states that there are three fundamental tasks that leaders face: "*creating strategies to adapt the organization to*

the environment, building a structure that is capable of implementing the organization's strategy, and building the capacity of the members of the organization" (Spears, 1998, p. 338).

Leadership and Knowledge Management (KM) intermingle the vision and influence of leadership with the available knowledge base within the organization. Successful organizations must harness all its potential and knowledge. Therefore, Goldsmith, et al. (2004) suggest, "*Nothing is more important to the success of knowledge management initiative than the support of leaders and the visibility of KM role models. Generally speaking, the higher up in the organization these role models are the better*" (p. 9). Goldsmith *et al.* contend that "*the sheer concept of knowledge management is fundamentally flawed -- it involves neither knowledge nor management and therefore cannot be expected to succeed*" (p. 39). Instead, he suggests "*begin to focus on helping organizations truly share the intellectual capital their workers possess*" (Goldsmith *et al.*, 2004 :p. 39).

But does leadership always have to come from the top down? Wallington (2002) poses the thought that leadership skills can be found at all levels of an organization. Lower level employees can—and should—exhibit leadership to influence those at the top of the organization. Before doing so, however, the individual should consider how to be most effective when attempting to lead from below.

3. Knowledge and economics

These trends are leading to revisions in economic theories and models, as analysis follows reality. Economists continue to search for the foundations of economic growth. Traditional "*production functions*" focus on labour, capital, materials and energy; knowledge and technology are external influences on production. Now analytical approaches are being developed so that knowledge can be included more directly in production functions. Investments in knowledge can increase the productive capacity of the other factors of production as well as transform them into new products and processes. And since these knowledge

investments are characterized by increasing (rather than decreasing) returns, they are the key to long-term economic growth.

It is not a new idea that knowledge plays an important role in the economy. According to the neo-classical production function, returns diminish as more capital is added to the economy, an effect which may be offset, however, by the flow of new technology. Although technological progress is considered an engine of growth, there is no definition or explanation of technological processes. In new growth theory, knowledge can raise the returns on investment, which can in turn contribute to the accumulation of knowledge. It stimulates more efficient methods of production organization as well as new and improved products and services. There is thus the possibility of sustained increases in investment which can lead to continuous rises in a country's growth rate. Knowledge can also spill over from one firm or industry to another, with new ideas used repeatedly at little extra cost. Such spillovers can ease the constraints placed on growth by scarcity of capital (Wallingto, 2002).

Technological change raises the relative marginal productivity of capital through education and training of the labor force, investments in research and development and the creation of new managerial structures and work organization. Abramowitz (1989) argues that analytical work on long-term economic growth shows that in the 20th century the factor of production growing most rapidly has been human capital, but there are no signs that this has reduced the rate of return to investment in education and training. Investments in knowledge and capabilities are characterized by increasing returns. These findings argue for modification of neo-classical equilibrium models – which were designed to deal with the production, exchange and use of commodities – in order to analyze the production, exchange and use of knowledge.

Spears (1980) argues that in the knowledge-based economy, firms search for linkages to promote inter-firm interactive learning and for outside partners and networks to provide complementary assets. These relationships help firms to spread the costs and risk associated with innovation among a greater number of organizations, to gain access to new research results, to acquire key technological components of a new product or process, and to share assets in manufacturing,

marketing and distribution. As they develop new products and processes, firms determine which activities they will undertake individually, in collaboration with other firms, in collaboration with universities or research institutions, and with the support of government.

Innovation is thus the result of numerous interactions by a community of actors and institutions, which together form what are termed national innovation systems. Increasingly, these innovation systems are extending beyond national boundaries to become international. Essentially, they consist of the flows and relationships which exist among industry, government and academia in the development of science and technology. The interactions within this system influence the innovative performance of firms and economies. Of key importance is the “*knowledge distribution power*” of the system, or its capability to ensure timely access by innovators to the relevant stocks of knowledge. Efforts are just beginning to quantify and map the diffusion paths of knowledge and innovation in an economy – considered the new key to economic performance.

4. Knowledge and Employment

The knowledge-based economy is marked by increasing labor market demand for more highly skilled workers, who are also enjoying wage premiums. Studies in some countries show that the more rapid the introduction of knowledge-intensive means of production, such as those based on information technologies, the greater the demand for highly skilled workers. Other studies show that workers who use advanced technologies, or are employed in firms that have advanced technologies, are paid higher wages. This labour market preference for workers with general competencies in handling codified knowledge is having negative effects on the demand for less-skilled workers; there are concerns that these trends could exclude a large and growing proportion of the labor force from normal wage work.

The *OECD Jobs Study* noted a tendency in the 1980s towards a polarization in labor markets. In the United States, relative wages for less-skilled workers declined while the overall unemployment rate remained low. The United Kingdom was marked by a similar growing wage gap between skilled and

unskilled workers. In the other major European countries, there was no polarization in terms of wages but the employment situation worsened for unskilled workers. Japan largely avoided an increase in polarization in both wages and job opportunities. While labor market policies and other government regulations contribute to these different outcomes, they also reflect changes in technology which have made educated and skilled labor more valuable, and unskilled labor less so (OECD, 1994).

Three different hypotheses have been proposed to explain current labor market trends in the OECD countries: globalization; biased technological change; and developments in firm behavior.

- ◇ One hypothesis is that globalization and intensified international competition have led to decreased relative demand for less-skilled workers in the OECD countries. Empirical work, however, shows that increasing imports from low-wage countries may contribute to some unemployment, but that the scale of the import increase is so limited that it could not possibly by itself explain more than a small part of the phenomenon (Katz and Murphy, 1992).
- ◇ An alternative explanation is that technological change has become more strongly biased in favors of skilled workers. The evidence is somewhat scattered, but studies of the use of information technology highlight this tendency. Data show that the polarization of wages and employment opportunities is most dramatic in firms which have introduced computers and other forms of information technology in the workplace (Krueger, 1993; Lauritzen, 1996).

Some scholars point to institutional change in the labor market and changes in firm behavior as the main reason for falling real wages for low-skilled workers in some OECD countries. New high-performance workplaces and flexible enterprises stress worker qualities such as initiative, creativity, problem-solving and openness to change, and are willing to pay premiums for these skills. Moreover, the weakening of trade unions in some countries may have a negative impact on the relative position of the least-skilled workers, because it has led

employers to implement a low-wage strategy in which delocalization and outsourcing are important elements.

One problem with these hypotheses is that much of the analysis is based on United States' data, which may not be applicable to other countries. Another weakness is that the three hypotheses have generally been tested separately and regarded as alternatives to each other, when it is more plausible that they interact in their impact on jobs. More likely, these three phenomena – increases in the pace of internationalization; technological change; and their consequent impact on the way firms organize themselves – have combined to intensify the demand for rapid learning at all levels of the economy. While there are dislocations in the labor market in the short term, enlightened approaches to knowledge accumulation and learning should lead to enhanced growth and job creation in the longer term.

4.1. Infrastructure

Lee and Choi (2003) and Migdadi (2005) argue that knowledge management infrastructure enablers are the overall organizational activities or mechanisms that can stimulate knowledge creation, protect knowledge, and facilitate the sharing of knowledge in an organization. In other words, they refer to modular products and organizational designs which enable KM activities in an organization. A broad range of these factors has been identified in the literature. The model for this research incorporates four elements, three of them - including organizational structure, organizational culture, and information technology - are adopted from Gold, Maholtra and Segars (2001) and the remaining element - people - is adopted from Lee and Choi (2003).

Following Pan and Scarbrough's (1998) classification scheme for resources, these elements are categorized into two perspectives: social and technical views. The next subsection presents a brief outline of each component of KM infrastructure capability of an organization in terms of social and technical perspectives.

4.2. Organizational structure

In systems thinking, an organization is conceived of as being composed of elements and relations between elements. These relations as a whole constitute an organization (Checkland 1999). According to Miller and Droge (1986), organizational structure involves centralization of authority, formalization, complexity, and integration. It is the way in which responsibility and power are allocated and work procedures are carried out among organizational members (Nahm, Vonderembse & Koufteros 2003).

Since it provides the skeletal structure for all organizational decisions and processes, organizational structure is the primary driver of change (Wang & Ahmed 2003). Among various ways of categorizing shifts of organizational structure, Schein (1988) identifies three dimensions: the hierarchical dimension which contains the ranks within an organization in a manner similar to an organizational chart; the functional dimension which identifies the different types of work to be done; and the inclusion and centrality dimension which shows the distance of any given person from the central core of the organization.

Considerable attention has been paid to the relationships of contingency between environments, organizational form and function, and a number of studies have examined the impact of changing external circumstances and the need to develop appropriate structural forms (Chandler 1962). Piercy and Cravens (2000) draw our attention that the common trajectory of structural transition involves a scenario in which a traditional hierarchical structure is replaced by flatter and more flexible one in the post-modern world of business (Piercy and Cravens, 2000). In other words, hierarchical structures in turbulent business environments become deficient (Drucker 1995), displaying their unwanted side effects of rigid bureaucracy which hinders the flow of information and promotes excessive specialization of work processes which hinder the integration of expert knowledge and speedy responses to the competitive environment (Cross 2000). Sawhney and Prandelli "Instead, it is argued that organic structures are better suited because of their ability to create and adapt, providing organizations with high flexibility without degenerating into chaos (Sawhney and Prandelli 2002: p.). Consequently, a range of new forms of organizational structures have emerged in the new economy such as network organizations, knowledge-based organizations, virtual organizations, modular organizations, and hypertext organizations (Wang and Ahmed 2003). These

organizational structures are created on the basis of core competence or knowledge creation which is inherently dynamic, sensitive to the environment and can easily adapt to external pressures as well as actively meet or even exceed internal demands (Prahalad and Hamel 1990).

Since KM initiatives can be structurally organized as separate organizational units, as projects, or as informal initiatives (Maier & Remus 2002), the organizational structure within an organization may encourage or inhibit KM (Gold, Malhotra and Segars 2001; Hedlund 1994; Nonaka and Takeuchi 1995). Supporting the above arguments, many KM authors also suggest that organizations need to change from having hierarchical departmentalized structures to flatter, organic, network styles who kich facilitate transferring and creating knowledge for the organization (Beveren 2003; Gehani 2002; Pemberton and Stonehouse 2000) and that successful organizations of the future will be characterized by simplicity and flexibility of organizational design (Beveren 2003). Due to the impact of the knowledge age with its rapid development and diffusion of technology, organizations are eliminating many layers so that information and work processes can flow efficiently (Drucker 1993) and the strategic business units (SBUs) become more responsive to their markets, supporting and enhancing their competitive strategies (Aaker 2001; Mintzberg 1996a).

While agreeing that organizational structure is one important independent variable affecting the facilitation of the knowledge processes, Dilnutt (2000) also concludes that organizational structure can inhibit or enable effective KM through the influence of the structural framework in place, the way this framework facilitates knowledge creation and innovation, the impact of this framework on corporate behaviour, and the provision of access to knowledge to foster creativity with the allocation of responsibility to individuals.

4.3. Organizational culture

Organizations are made up of individuals, each with their own unique behaviors, norms, and values (Prusak, 1996), and the accumulation of those individuals creates the organizational culture (Dilnutt, 2000). In other words, organizational culture is an aggregate of the shared understandings of individuals

which influence the collective behaviour of the organization (Lyles and Schwenk 1992).

There are many definitions of organizational culture, some of which have an anthropological foundation and some of which have a sociological foundation (Roman-Velazquez 2004). According to Schein (1992), organizational culture refers to "a pattern of basic assumptions that the group learns as it solves its problems of external adaptation and internal integration. Moreover, this pattern of assumptions should „work well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (Schein, 1992 : p. 153). Schein argues that there are three basic levels to the way in which the culture is visible to the observer, namely artifacts, exposed values, and basic underlying assumptions. The last level refers to unconscious, taken-for- granted beliefs, perceptions, thoughts and feelings, which are the deeper level of culture and source of values and actions. While the concept of organizational culture is hard to define, analyze, measure, and manage, efforts to understand it are worthwhile because many of the complex and mysterious problems in organizations suddenly become clear when the culture is understood (Schein, 1992).

With regard to the functions of organizational culture, Martin and Terblanche (2003) summarize them as internal integration and coordination. In particular, internal integration can be described as the socializing of new members in the organization, creating the boundaries of the organization, and the feeling of identity among personnel and commitment to the organization. The coordination function refers to creating a competitive edge, making sense of the environment in terms of acceptable behavior and social system stability (Migdadi, 2005).

In relation to the concept of KM, DeLong and Fahey (2000) identify four comprehensive ways in which culture influences the behaviors central to knowledge creation, sharing, and use.

First, culture shapes assumptions about what knowledge is and which knowledge is worth managing. Second, culture defines relationships between individual and organizational knowledge, determining who is expected to control specific knowledge, as well as who must share it and who can hoard it. Third, culture creates the context for social interaction that determines how knowledge will be used

in particular situations. Finally, culture shapes the processes by which new knowledge with its accompanying uncertainties is created, legitimated, and distributed in organizations.

To stimulate the development and application of knowledge within an organization, a culture of confidence and trust is required (Moffett, McAdam & Parkinson 2002). Similarly, Martin (2000) indicates that the key elements of a knowledge culture are a climate of trust and openness in an environment where constant learning and experimentation are highly valued, appreciated and supported. Cultures that explicitly favour knowledge sharing and knowledge integration encourage debate and dialogue in facilitating contributions from individuals at multiple levels of the organization (Davenport & Prusak 1998). In particular, dialogue between individuals or groups is often the basis for the creation of new ideas and can, therefore, be viewed as having the potential for creating knowledge. Moreover, employee interaction and collaboration, especially among those not working side by side, are very important when an organization attempts to transmit tacit knowledge between individuals or convert tacit knowledge into explicit knowledge, thereby transforming it from the individual to the organizational level.

Dilnutt (2000) in his doctoral thesis on KM investigates how the independent variable of organizational culture inhibits or enables KM processes. While McDermott and O'Dell (2001) conclude that culture is a key inhibitor to effective knowledge sharing, Turban and Aronson (2001) add that „the ability of an organization to learn, develop memory, and share knowledge is dependent on culture. Organizations should establish an appropriate culture that encourages people to create and share knowledge within an organization (Holsapple & Joshi 2001; Leonard-Barton 1995). Consequently, organizational culture becomes one of the most important factors for the successful implementation of KM efforts. It is the development of a culture that promotes and encourages the KM practices toward organizational objectives that are essential to enhance corporate performance and achieve CA based on innovation (Donate and Guadamillas 2010; Tseng 2010).

The role of organizational culture as a source of SCA has also been strongly stated in the literature. Barney (1986) concludes that organizations that do not have the required cultures cannot engage in activities that will modify their culture and

generate sustained superior performance because their modified culture typically will be neither rare nor imperfectly imitable. Moreover, he adds that organizations which have a culture that supports and encourages cooperative innovation should try to understand what it is about their culture that gives them a CA and develop and nurture those cultural attributes (Barney, 1986). Similarly, Hibbard (1998) argues that strong culture is a determinant of organizational performance and organizations, to remain competitive, must be able to utilize their knowledge of customers, products, services, and resources, or in other words, they must be able to overcome cultural barriers in knowledge sharing (Soley and Pandya 2003).

4.4. Human resources

(T-shaped skills) Human resources of organizations are recognized to be the key enabler in successful KM (Lee and Choi 2003). Since knowledge resides in people's heads, "human resources are at the heart of creating organizational knowledge" (Lee and Choi, 2003 : p. 54). In addition, human interaction is the critical source of intangible value in the intellectual age (O'Donnell and Berkery 2003). To stay competitive, organizations need to capitalize on their intellectual assets, especially the intellectual capacity of their workers (Hung 1998). Thus, managing people who are willing to create and share knowledge is an important task and finding new sources of motivation to increase people participation in knowledge sharing is a real challenge for organizations (O'Dell and Grayson 1999; Migdadi 2005).

According to Leonard-Barton (1995), the skills and knowledge embodied in employees is the dimension most often associated with core capabilities and thus, the most important factor in sustaining organizational CA. He argues that there are at least three types of skills and knowledge constituting this dimension of a core capability, including public or scientific, industry-specific, and organization -specific knowledge. "The first two kinds of skills and knowledge can be easily duplicated through formal educational and training programs or by hiring consultants and luring industry specialists from competitors. However, organization -specific or in- house knowledge is not so easily imitated and it must be cultivated overtime" (Leonard-Barton, 1995 : p. 253).

Skills have been classified in the broad and deep knowledge areas with functional or disciplinary skills relate to deep knowledge and those skills that can be applied across situations and interdepartmentally are termed broad knowledge (Truran 1998). People possessing both knowledge areas would be said to have T-shaped skills where the stem of the T shows deep knowledge and the cross of the T represents broad knowledge. T-shaped skills enable their possessors to explore the interfaces between their particular knowledge domain and various applications of that knowledge in particular products (Leonard-Barton 1995). People with T-shaped skills would have a desired ability to understand the technical facets of their discipline and also understand the operation of the organization as a whole (Migdadi 2005).

For example, in his research, Iansiti (1993) found that these people not only have a deep knowledge of a discipline like ceramic materials educational but also know how their discipline interacts with others such as polymer processing. In addition, he found that team members with T-shaped skills constituted the underpinnings of the systems-focused approach used by superior-performing organizations who needed fewer than one-third the engineers and completed their projects an average of 2.6 years sooner than competitors designing directly competing products in the same business.

In other words, people with T-shaped skills are able to expand their competence across several functional areas and thus, they are capable of convergent, synergistic thinking (Leonard- Barton 1995). They can also combine theoretical and practical knowledge and integrate diverse knowledge sets. As a result, the presence of employees with T-shaped skills has a significant and positive impact on knowledge creation process (Leonard-Barton 1995; Johannessen, Olsen and Olaisen 1999; Madhavan and Grover 1998; Migdadi 2005). However, these people will attempt to create new knowledge only if their organization has an environment that encourages forming T-shaped skills and provides a systematic management of these skills (Lee and Choi 2003; Migdadi 2005).

5. Government Policies

National policies should continue to shift from industrial to post-industrial knowledge-based economies. Productivity and growth are largely determined by the rate of technical progress and the accumulation of knowledge. Networks can efficiently distribute knowledge and information. The knowledge-intensive or high-technology parts of the economy tend to be the most dynamic in terms of output and employment growth, which intensifies the demand for more highly skilled workers. Learning on the part of both individuals and firms is crucial for realizing the productivity potential of new technologies and longer-term economic growth.

Policies of science and technology, industry and education need a new emphasis in knowledge-based economies. Such policies should affirm the central role of the firms, the importance of national innovation systems and the requirements for infrastructures and incentives which encourage investments in research and training (OECD, 1996b). Hence, there are three priorities will, as follows:

- a) **Enhancing knowledge diffusion:** providing the framework for university-industry-government collaborations, promoting the diffusion of new technologies to a wide variety of sectors and firms, and facilitating the development of information infrastructures.
- b) **Upgrading human capital:** providing broad-based formal education, establishing incentives for firms and individuals to engage in continuous training and lifelong learning, and improving the matching of labor supply and demand in terms of skill requirements.
- c) **Promoting organizational change:** to increase flexibility, networking, multi-skills and decentralization, and to provide the conditions and enabling infrastructures for these changes through appropriate financial, competition, information and other policies.

The top management contribution in terms of vision, identified the importance of front-line staff and middle management in closing the vision-reality gap: *"In our view middle managers play a key role in the organizational knowledge-creation process. They have a lot of knowledge being positioned at the intersection of the vertical and*

horizontal flows of information in the company, which qualifies them to serve as team leaders."(Nonaka and Takeuchi, 1998 : p.47)

5.1. Educational Policy Makers

Educational policy makers need to accelerate reforms that support blended learning models or it can inhibit the adoption of blended learning models. Relevant policies include support for online learning, teacher certification and funding mechanisms. Policymakers need to ensure that these policies provide schools with the room to test innovative models that may collide with outdated policies.

The existing policies are designed for a teacher lecturing in front of a class, not blended learning environments in which students work on personalized lessons on computers, engage in small-group work, and receive more one-on-one time with teachers and paraprofessionals. Blended learning models promote competency-based learning, giving students the flexibility to learn more skills and capacities. Another policy link is school improvement and accountability for building and executing a blended learning turnaround requires strong and experienced leadership.

In the broadest sense, any learning sequence that combines multiple modalities is blended. A narrower definition that includes an intentional shift to an online environment for a portion of the day to boost learning and operational productivity by providing a school experience that works better for students and teachers and ultimately yields increased learning opportunities and improved student outcomes. Strategies that may be productive, but don't yet realize the full potential of blended learning include:

- Classrooms that have some computers with digital curricula.
- Teachers who are experimenting with flipped classroom strategies.
- Schools that have a computer lab that classes can use.
- Computer purchases that improve device access ratios.

These strategies may be beneficial, but if they do not change instructional practices, schedules, relationships, and resource allocations, they are not considered blended learning. Creating and supporting the opportunity for secondary students to take online courses (advanced, credit recovery, and options) is considered blended

learning because it may require a new use of space, time, and resources. It also includes a shift in delivery that may be more productive for the student and the school.

Blended learning implies a big, complicated, multifaceted project. It requires a lot of support building before and communication during implementation. If the shift to blended learning feels like "just another district initiative," it is doomed to failure. This section discusses building support for a blended learning initiative and funding the shift.

5.2. Defining Academic Goals

The difference between blended learning and just adding computers to the way schools have always operated is that there is a regular and intentional change in delivery to boost learning and leverage teacher talent. To build support for a blended learning initiative, start by connecting the shift to blended learning with overall district goals to improve college and career readiness by employing technology to create more personalized, deeper learning opportunities. The goal statements :

- **Powerful learning experiences:** Every student will consistently experience classroom work and activities that are meaningful, engaging, and relevant, connecting to students' interests and/or previous knowledge.
- **Global preparedness:** Every student will be immersed each day in learning opportunities intentionally designed to develop skills such as critical thinking, problem solving, teamwork, and data analysis, enabling them to compete globally.
- **Growth for all:** Every student, regardless of starting point, will achieve at least one year of academic progress in reading and mathematics each school year.
- **Excellence in communication:** Every student will be provided regular and multiple opportunities to demonstrate learning through verbal and written communications, visual and performing arts, and the use of multiple forms of technology.

- **An informed and involved community:** The educational organization will establish effective two- way communication, in various forms, with all stakeholders in the community.

These goals start with student engagement, they imply a focus on communication, they focus on growth for all students, and they conclude with community connections. Metrics could be applied to each of these areas to create a results dashboard that can become the basis of a report to the community.

The issue that has most changed is teacher, student, and parent adoption of learning applications. A survey of change readiness should attempt to gain an understanding of the learning applications being used in school and at home. Identifying existing areas of teacher initiative is critical to harnessing teacher leadership as part of a blended learning strategy.

6. Indicators for the Knowledge-Based Economy

Economic indicators are measures that summarize at a glance how an economic system is performing. Since their development in the 1930s, the national accounts and measures such as Gross Domestic Product (GDP) have been the standard economic indicators of the OECD countries. Based on detailed censuses that survey economic activity at the establishment level, they measure broad aggregates such as total production, investment, consumption and employment and their rates of change. These traditional indicators guide the policy decisions of governments and those of a broad range of economic actors, including firms, consumers and workers. But to the extent that the knowledge-based economy works differently from traditional economic theory, current indicators may fail to capture fundamental aspects of economic performance and lead to misinformed economic policies.

Measuring the performance of the knowledge-based economy may pose a greater challenge. There are systematic obstacles to the creation of intellectual capital accounts to parallel the accounts of conventional fixed capital. At the heart of the knowledge-based economy, knowledge itself is particularly hard to quantify and also to price. We have today only very indirect and partial indicators of growth in the knowledge base itself. An unknown proportion of knowledge is

implicit, uncodified and stored only in the minds of individuals. Terrain such as knowledge stocks and flows, knowledge distribution and the relation between knowledge creation and economic performance is still virtually unmapped.

6.1. Measuring knowledge

The methodology for measuring GDP and most other macroeconomic indicators is specified by the United Nations System of National Accounts, which are structured around input-output tables that map inter-sectoral transactions. In the national accounts framework, the gross output of each establishment is measured by its market value and summed across sectors and/or regions. Net output by sector or region is obtained by subtracting out intermediate purchases. National GDP is the sum of net outputs across sectors and regions. To the extent that input-output proportions are stable, this double-entry framework translates input statistics into output indicators. Thus employment, strictly speaking an input, can also be interpreted as an indirect indicator of the level of national output.

In the knowledge-based economy, problems emerge with the conceptual framework of the national accounts. Not least is the issue of subsuming knowledge creation into a measurement system designed for traditional goods and services. The pace of change complicates the task of measuring aggregate output and raises questions about the use of input measures as output indicators. Factors which are not sufficiently incorporated into the national accounts framework include qualitative changes in products, the costs of change and rapid product obsolescence.

Knowledge is not a traditional economic input like steel or labor. When traditional inputs are added to the stock of economic resources, the economy grows according to traditional production function “*equations*”. For example, more labor can increase GDP by an amount that depends on current labor productivity, or more steel can increase production of autos, housing or tools by predictable amounts according to the current state of the arts. New knowledge, in contrast with steel or labor, affects economic performance by changing the “*equations*” themselves – it provides product and process options that were previously unavailable.

While new knowledge will generally increase the economy's potential output, the quantity and quality of its impact are not known in advance. There is no production function, no input-output “*equation*” that tells, even approximately, the effect of a “*unit*” of knowledge on economic performance. Knowledge, unlike conventional capital goods, has no fixed capacity. Depending on entrepreneurship, competition and other economic circumstances, a given new idea can spark enormous change, modest change or no change at all. Increased resources devoted to knowledge creation are likely to augment economic potential, but little is known as to how or how much. Thus the relationship between inputs, knowledge and subsequent outputs are hard to summarize in a standard production function for knowledge.

It is also difficult to stabilize the price of knowledge by the trial and error discipline of repeated transactions in the market. There are neither company knowledge records nor census of knowledge creation or exchange. In the absence of knowledge markets, there is a lack of the systematic price information that is required to combine individual knowledge transactions into broader aggregates comparable to traditional economic statistics. In knowledge exchanges, a purchaser has to gauge the value of new information without knowing exactly what it is he is to buy. New knowledge creation is not necessarily a net addition to the economically relevant knowledge stock, since it may render old knowledge obsolete.

There are thus four principal reasons why knowledge indicators, however carefully constructed, cannot approximate the systematic comprehensiveness of traditional economic indicators:

- there are no stable formulae or “equations” for translating inputs into knowledge creation into outputs of knowledge;
- inputs into knowledge creation are hard to map because there are no knowledge accounts analogous to the traditional national accounts;
- knowledge lacks a systematic price system that would serve as a basis for aggregating pieces of knowledge that are essentially unique new knowledge creation is not necessarily a net addition to the stock of knowledge; and

- obsolescence of units of the knowledge stock is not documented.

The problem of developing new indicators is itself an indication of the unique character of the knowledge-based economy. Were we faced with trivial modifications to the traditional accounting system, a few add-on measures might suffice. To fully understand the workings of the knowledge-based economy, new economic concepts and measures are required which track phenomena beyond conventional market transactions. In general, improved indicators for the knowledge-based economy are needed for the following tasks:

- measuring knowledge inputs;
- measuring knowledge stocks and flows; and
- measuring knowledge outputs.

a) **Measuring knowledge inputs**

Students of the knowledge-based economy have to date focused on new knowledge formation or knowledge inputs. The principal knowledge indicators, as collected and standardized, are: *i*) expenditures on research and development (R&D); *ii*) employment of engineers and technical personnel; *iii*) patents; and *iv*) international balances of payments for technology. Some of these activities are classified by sponsorship or source of funding (government and industry) and by sector of performance (government, industry, academia). Major emphasis has been placed on the input measures of R&D expenditures and human resources. Despite significant advances in recent years, these traditional indicators still have a number of shortcomings with respect to mapping the knowledge-based economy.

Indicators of R&D expenditures show direct efforts to enlarge the knowledge base and inputs into the search for knowledge. Indicators relating to research personnel approximate the amount of problem solving involved in knowledge production. But only a small fraction of all inputs into knowledge creation are attributable to formal R&D expenditures and official research personnel. Successful R&D draws on ideas from many different sources, including informal professional exchanges, users' experiences and suggestions

from the shop floor. In addition, current indicators count formal R&D conducted by the public sector, academia and large manufacturing firms, and tend to understate research expenditures by small firms and service-sector enterprises. As data collection improves, the importance of the services sector to R&D and innovation is only now being fully recognized.

Patents, since they represent ideas themselves, are the closest to direct indicators of knowledge formation; of all the traditional knowledge indicators, patents most directly measure knowledge outputs (rather than inputs). Patent data have certain advantages in that most countries have national patent systems organized on centralized databases, the data cover almost all technological fields, and patent documents contain a large amount of information concerning the invention, technology, inventor, etc. There are several ways to analyze patent data, including categorizing patents by geographic area and industrial product group. However, differences in national patenting systems introduce bias which make comparisons difficult. In general, not all new applications of knowledge are patented and not all patents are equally significant. Patents also represent practical applications of specific ideas rather than more general concepts or advances in knowledge.

The technology balance of payments measures international movements of technical knowledge through payments of licensing fees and other direct “*purchases*” of knowledge, and thus is more appropriately a flow measure than an input measure. But there is no claim that the technology balance of payments measures the full flow of technical knowledge between any two countries. International transfers of knowledge through employment of foreign personnel, consulting services, foreign direct investment or intra-firm transfers are important avenues of diffusion that are not factored into these indicators. International joint ventures and co-operative research agreements are also instrumental in the global diffusion of knowledge.

b) Measuring knowledge stocks and flows

In order to improve the measurement of the evolution and performance of the knowledge-based economy, indicators are needed of the stocks and flows of

knowledge. It is much easier to measure inputs into the production of knowledge than the stock itself and related movements. In the case of traditional economic indicators, the transmission of goods and services from one individual or organization to another generally involves payment of money, which provides a “*tracer*”. Knowledge flows often don't involve money at all, so that alternative “*markers*” must be developed to trace the development and diffusion of knowledge.

Measuring the stock of physical capital available to an economy is an obvious task, so that measuring the stock of knowledge capital would seem almost impossible. Yet measuring knowledge stocks could be based on current science and technology indicators if techniques were developed for dealing with obsolescence. For example, annual R&D inputs could be accumulated for various countries and industries and then amortized using assumptions concerning depreciation rates. In this way, measures of R&D stock relative to production have been used to estimate rates of return to R&D investment. Similarly, stocks of R&D personnel could be estimated based on annual increases in researchers in particular fields, depreciated by data on personnel movements and occupational mobility. The patent stock might be approximated using data on use and expiration of periods of exclusive rights.

A more difficult challenge is measuring the flows of knowledge, or the proportion of knowledge stock which enters into the economy during some time period. Two proxy indicators are most frequently used to measure knowledge flows: i) embodied diffusion, or the introduction into production processes of machinery, equipment and components that incorporate new technology; and ii) disembodied diffusion, or the transmission of knowledge, technical expertise or technology in the form of patents, licenses or know-how.

Overall flows of embodied knowledge, particularly embodied technology or R&D, can be measured using input-output techniques. Technology flow matrices have been constructed as indicators of inter-industry flows of R&D embodied in intermediate and capital goods. This methodology allows separation of the equipment-embodied technology used by a particular industry into the technology generated by the industry itself and the technology acquired through

purchases. In this way, estimates can be made of the proportions of R&D stock which flow to other industries and the extent to which industries are sources of embodied knowledge inputs. Analysis of embodied technology diffusion shows that inter-sectoral flows vary by country. Countries also differ in the amount of embodied technology acquired from abroad vs. that purchased domestically (Sakurai *et al.*, 1996).

Micro-level analyses of embodied knowledge flows focus on the diffusion and use of specific technologies in different sectors of the economy – an area of analysis which needs more standardization across countries in order to allow international comparisons. Studies attempting to compare the diffusion of microelectronics in OECD countries have encountered severe statistical problems in defining the technologies, gathering data on use and calculating the share of total investment (Vickery, 1987). Existing comparative data are sketchy; they show generally that Japan and Sweden have the most widespread use of advanced manufacturing technologies (AMT), followed by Germany and Italy who have profited from AMT in their motor vehicle and mechanical engineering sectors. Industry in the United States uses relatively more of other types of computer-based engineering applications .

More is known about technology diffusion patterns in individual countries. Canadian surveys, for example, have asked manufacturing firms about their use of 22 advanced manufacturing technologies, including computer-aided design and engineering (CAD/CAE), computer integrated manufacturing (CIM), flexible manufacturing systems, robotics, automated inspection equipment and artificial intelligence systems. Approximately 48 per cent of Canadian firms use these technologies, mostly in the area of inspection and communications. The attempt to relate technology use to performance showed that technology-using firms tended to have higher labor productivity and to pay higher wages than non-users (Baldwin *et al.*, 1995).

Information technology indicators are being developed which focus on the diffusion and use of information technologies – computers, software, networks – by businesses and households. These measures of technology flows, and factors facilitating and impeding such flows, such as pricing, give an indication of the

rapid growth of the information society. For example, the OECD is compiling indicators of the number of personal computers, CD-ROMs, fax machines and modems per household in the OECD countries. Data show that the use of personal computers has more than doubled in the last decade, with about 37 per cent of US households having computers compared to 24 % in the United Kingdom and 12 % in Japan.

The knowledge-based economy is an interactive economy at both the national and international levels as illustrates by emerging indicators of computer and communications network infrastructure. Such measures show the ratio of households and businesses with outside computer linkages, cable connections and satellite services. More work is needed on indicators by country and region of the development of the Internet, the world-wide web of computer networks; these include host penetration, network connections, leased line business access, dial-up services and price baskets. Growth in the number of computers hooked to the Internet has been phenomenal – from 1 000 in 1984 to 100 000 in 1989 to over 4.8 million in 1995. It is estimated that the number of Internet users (as opposed to official host connections) exceeded 30 million in 1995 (OECD, 1995*b*).

Flows of disembodied knowledge are most often measured through citation analysis. In scholarly journals and patent applications, it is the practice that users of knowledge and ideas cite their sources. This makes it possible to map the interconnections among ideas in specialized areas. For example, the *Science Citation Index* provides a database for exploring inter- and intra-disciplinary flows of knowledge in the realm of basic research. Attempts have been made to map the interdependence of scientific ideas using a citation index (Small and Garfield, 1985; Leontief, 1993). In the future, computer capabilities may make it possible to scan and analyze enormous volumes of text, flagging complex similarities and differences and enabling us to identify knowledge flows beyond the areas where formal citation is practiced.

Others have traced the linkages among areas of applied technical knowledge through patent citations, which are considered carriers of the R&D performed in the originating industry. Based on a concordance of US patent classes and related research, input-output matrices have been constructed of US

industry with the rows being the generating industry, the columns the user industry and the diagonal elements the intramural use of process technology. The patent data show that about 75 % of industrial R&D flowed to users outside the originating industry (Scherer, 1989). Similarly, improved data on international patent citations can help track technology flows on a global basis as could further refinements of technology balance of payments measures. But while the amount of knowledge subject to formal citation requirements includes the entire content of scientific literature and all patented ideas, these areas are only limited parts of the modern economy's knowledge base.

c) Measuring knowledge outputs

The standard R&D-related measures do not necessarily show successful implementation or the amount and quality of outputs. Nevertheless, these input and flow indicators form the starting point for measuring knowledge outputs and for gauging social and private rates of return to knowledge investments. Rough indicators have been developed which translate certain knowledge inputs into knowledge outputs in order to describe and compare the economic performance of countries. These measures tend to categorize industrial sectors or parts of the workforce as more or less intensive in R&D, knowledge or information. The measures are based on the assumption that certain knowledge-intensive sectors play a key role in the long-run performance of countries by producing spill-over benefits, providing high-skill and high-wage employment and generating higher returns to capital and labor.

For example, the OECD maintains a classification of high-technology, medium-technology and low-technology manufacturing sectors based on their relative R&D expenditures or R&D intensity (ratio of R&D expenditures to gross output). Computers, communications, semiconductors, pharmaceuticals and aerospace are among the high-technology and high-growth OECD sectors and are estimated to account for about 20 % of manufacturing production. Output, employment and trade profiles can be drawn for countries, based on the relative role of their high-, medium- and low-technology sectors. However, current indicators of R&D intensity are now confined to manufacturing sectors

and have not been developed for the fast-growing service portion of OECD economies. Nor do these indicators take into account R&D which may be purchased from other industrial sectors, either embodied in new equipment and inputs or disembodied in the form of patents and licences. More complete indicators of total R&D intensity, including both direct R&D efforts and acquired R&D, need to be developed.

In a similar vein, early studies in the United States constructed a statistical profile of a group of industries collectively dubbed the knowledge industries, essentially education, communications media, computers and information services. These knowledge industries were found to account for some 29 % of GNP and 32 % of the workforce in the United States in 1958 (Machlup, 1962). A later study showed that the proportion of knowledge production in the (adjusted) GNP increased from 29 % in 1958 to 34 % in 1980 (Rubin and Huber, 1984). A US government study included a similar list of sectors and added a secondary information sector which provided inputs to the manufacturing process for non-information products; the entire information sector was estimated to account for over 46 per cent of GNP in 1974, updated to 49 % in 1981.

A related methodological approach is to use employment and occupational data to categorize jobs according to their R&D, knowledge or information content. One early study used occupational classifications to assign jobs an informational component; information workers included those in the primary information sector, a large portion of the public bureaucracy and a few in remaining sectors. According to this study, information activities accounted for 47 % of GNP in the United States in 1967 (Porat, 1977). Recent Canadian studies have measured the knowledge-intensity of the manufacturing and services sectors by the proportion of total weeks worked in an industry by workers with university degrees. High-knowledge sectors include electronic products, health services and business services, which were found to have expanded since the early 1970s while output in medium- and low-knowledge industries has declined (Gera and Mang, 1995).

Occupational data has been used to estimate the proportion of economic effort devoted to creating, implementing and administering change. One study finds a variation among sectors in the proportion of non-production workers in total employment, ranging from as high as 85 % in sectors normally seen as high-technology to 20 % or less in slower-growth, more traditional industries (Carter, 1994). There appears to be a close connection between the proportion of non- production workers and the rate of change in a sector; the major function of non-production workers may be to create or react to change. In these sectors, more workers are engaged in the direct search for new products and processes, in implementing new technology on the shop floor and in opening new markets and reshaping organizations to accommodate changes in production. As a result, a growing proportion of costs are most likely the costs of change rather than the costs of production.

Indicators are needed which go beyond measuring R&D and knowledge intensity to assessing social and private rates of return. Rates of return are generally estimated by computing the benefits (including discounted future benefits) *vs.* the costs of innovation. For example, early studies of the agricultural sector showed that public research was undervalued and that private investment did not naturally respond to the prospect of large returns to scientific research. One analysis estimated that social returns of 700 per cent had been realized from US\$2 million in public and private investments in the development of hybrid corn from 1910-55 (Griliches, 1958). In another, the median private return to the innovations studied was 25 %, while the median social rate of return was 56 % (Mansfield *et al.*, 1977). A recent review of macro-level econometric studies of the United States concluded that the average rate of return to an innovation is between 20 and 30 %, while the social rate of return is closer to 50 % (Nadiri, 1993).

7. Implications of leadership in KM approaches

As mentioned above, leadership is an interaction between the leaders and the teamwork. Knowledge Management is the process that requires the investment of the motivation to understand how to participate in learning organizations. The taskforce of such learning organizations become idea generators to develop new initiatives. It is

the ability to procure new knowledge and then integrate them into the framework of the organization. This would allow them to learn how to guide the internal marketplace within their organization.

Organizational leadership may adopt one of the two distinct paths to consider. A futuristic perspective would conceptualize individuals as agents of learning for the organization; the organization provides a positive learning culture and climate for the individual; the knowledge gained by the individual is stored outside the individual in the organizational memory; and the second perspective is an interpretive perspective, where reality is seen as a subjective phenomenon; knowledge is viewed as context dependent; learning is a social practice, taking place between individuals. Hence, knowledge cannot be stored because it is determined by the situation. If the situation is the determining factor for knowledge, then learning is not based on the foundation of truth but on the environment. The implications of such a perspective are including business ethics and cultural morality.

The most important duty of leadership is selecting a Chief Knowledge Officer (CKO) that can be ensuring the success of knowledge management in their organization. The CKO must understand how to implement KM approaches as an enabler for capturing, storing, and sharing knowledge, as well as aligning it with the values of the organization. Therefore, leadership should find candidates for CKO who are enthusiastic, idealist, creative and resourceful. Leaders may face the challenge of viewing KM approaches as more like a craft and less like a science. The source of such challenge comes from the nature of knowledge itself. Since it is difficult for managers to predict what measures can improve performance and how to encourage and guide knowledge flows within an organization.

As presented by some experts, if the senior leadership of an organization is not able to adopt and embrace KM approaches, it is far more likely to fail than to succeed. Leaders within organizations must be able to learn and demonstrate competency. Hence, knowledge and learning have become part and parcel to 'leadership'. Leaders have a desire to learn, an open and curious mind, make their learning public and tolerate risk.

Leaders in educational organizations face three fundamental tasks: (i) creating strategies to adapt the organization to the environment, (ii) building a structure that is capable of implementing the organization's strategy, and (iii) building the capacity of the teamwork of the organization. These fundamental tasks requires ongoing organizational learning in an environment of knowledge management - both explicit and tacit, and best understood through shared communication.

8. Conclusion

The chapter concludes that the problem emerges with the conceptual framework of knowledge-based economy. The pace of change complicates the task of knowledge creation output and raises questions about the use of input as output indicators. Consequently, knowledge is not a traditional economic input like steel or labor. New knowledge affects economic performance by changing the "*equations*" themselves – it provides product and process options that were previously unavailable.

Leaderships adopt certain indicators for measuring the performance in the knowledge-based economy to guide the policy decisions of governments. The existing indicators fail to capture fundamental aspects of economic performance, so the knowledge leadership come up with new indicators, snice knowledge has no fixed measurement tools. Depending on leadership or competition Increased resources devoted to knowledge creation are likely to augment economic potential, but little is known as to how or how much. Thus the relationship between inputs, knowledge and subsequent outputs are hard to figure them out.

9. The Hypothesis of the Research

Based on the literature reviewed, the researcher argues that there is a positive relationship between knowledge management and the educational organizations as leaning environments and sustainability.

The structure of this research consists of several dimensions: the depth and range of KM processes adopted in educational organizations, the impact of the intention of promoting KM utilization and the key factors that affect educational

organizations' performance. The first dimension focuses on educational characteristics which are the relevant environmental factors of the main learning processes and the situation of educational setting. The second dimension focuses on educational practices, looking at educational organization internal structure orientation and leadership style, and the degree of how such organizations support KM adoption. The third dimension focuses on IT. Since the intimate relationship between KM utilization and IT application, the depth of the adaptation is analyzed on the basis of the degree of KM adoption and the depth of coverage according to this research structure.

Knowledge management is a strategic approach assisting educational organizations to develop its strategic capabilities to deal with the enhanced dynamism and uncertainty of the business environment. Through the systematic acquisition, creation, sharing, and use of knowledge, organizations develop, renew and exploit their knowledge-based resources to be proactive and adaptable to external changes and attain competitive success.

By saying that, the researcher recognizes that much of literatures in KM clearly state that the frameworks and methodologies of KM suffer from different shortcomings. Coming to the conclusion that there is neither a universally accepted KM framework nor methodology and such failures have been linked to the lack of a generally accepted frameworks and methodologies to guide successful implementation of KM in organizations.

The researcher hypothesizes:

1. If knowledge workers are informed and well-trained in practicing the theoretical and practical rules of KM, it will be expected that they adopt KM principles in doing their duties;
2. If knowledge workers utilize *Information Communication Technology* strategies systematically, they think that their educational organization will become a professional knowledge creation organization as a learning organization;
3. If knowledge workers integrate KM strategies with administrative program, they think that the learning environments will become more intelligent;

4. If knowledge workers have more of years of experience in implementing KM approaches, their educational organizations will become learning organizations.

Chapter V

Methodology of the Research

1. Introduction

After the presentation of all theoretical and operational information about knowledge management, and presenting information about learning organization and knowledge leadership the researcher has built the research instruments based on the related literature. In this chapter, he will presenting the methodology of the research and the steps of conducting the research. He will shade light on the statistical information. According to Sekaran (1984) defines conducting a research as a systematic and designed effort to investigate a specific problem that needs a solution. He mentions that research consists of a series of steps designed and followed with the goal of finding answers to issues of concern. That means, the entire process is an attempt to solve problems. Neuman (1997) on the other hand adds that the methodology of conducting research must include defined logical rules and procedures to come up with an accepted research findings.

Moreover, Sekaran (1984) the hallmarks of scientific research are: sense of purpose, rigour, testability, replicability, accuracy, objectivity, generalizability, and parsimony. Scientific research is dependent on the concepts of theory and empirical research. Two approaches for search are the inductive and deductive.

The inductive approach is usually the methodology which produces new theories, rules or novel solutions. The deductive approach is based on certain theories and rules. The researcher in the deductive approach starts with a general view and moves to the particular (Neuman, 1997).

The researcher will introduce the design of this research and the logic behind its selection. Different design issues in some detail will be presented. The exploratory work conducted in educational organizations and the outcome resulted will be discussed.

2. Methodology of the Research

The researcher used the descriptive analytical method, since it is the appropriate approach to this kind of researches. The research is based on studying the phenomena as they are, providing accurate description and giving qualitatively or quantified expressions of the phenomena. The qualitatively expressions describe the phenomena and show its characteristics, while the quantitative expressions give numerical descriptions which explain the phenomenon in figures and associate them with various other phenomena (lentils, et al., 2003). Moreover, (Assaf 2003) describes the descriptive approach as an approach associated with the phenomenon of a contemporary approach to the purpose described and interpreted.

Because much of the information collected represents tacit knowledge, a variety of special observational and analytic items developed to provide a comprehensive account of graphic production. This methodology illuminates the link between the theoretical principles and practices exercised in the real world. The present research analyzes both historic and real-time information stemming from operational activity. The descriptive field investigation using frequency measures consist of: (1) specifying in objective terms the situation in which the research is conducted, (2) defining and recording behavioral and environmental events in observable terms, and (3) measuring observer reliability. Field-experimental researches using frequency measures would probably yield findings that would suggest the need for describing new interactions in specific natural situations.

3. Research Design

There are different types of research design that are used for various research purposes. These types can be generally classified into three categories: historical design, experimental design and non-experimental design. The choice of the research design depends on purpose of the research, the type of investigation, the setting of the research, the sampling of the population, and the method of data collection and analysis.

The choice of data collection methods depends on several factors, such as the availability of resources to the researcher, the time allocated for research, the

degree accuracy required in the study, the expertise of the researcher in conducting that kind of research, and cost associated with each method. Also, in the global environment, survey research has proved to be very practical, taking into consideration future research; it allows research to be replicated in cross-cultural studies which usually span many nations. In such a context, the survey questionnaire, as an example, is a very valuable method of data collection considering the cost and difficulties other methods may endure. It provides a means for cross-cultural comparison.

The research instrument that is used in most researches is questionnaire. It is a prewritten set of questions of respondents to record their answers. It is an efficient data collection technique with clear objectives and it can be measured and analyzed easily. Questionnaires can be administered easily. They can allow researchers to obtain data fairly easy, responses are easily coded and they are not expensive. But the main disadvantage is that questionnaires are not very deep and inflexible adaptation to the divergent circumstance of respondents. Sometimes questionnaires are inaccurate in data collection when some variables are not well-controlled such the subjectivity of respondents, the omission or incompleteness of them.

Another research instrument, adopted by the researcher, is structured interview. It is conducted when the exact information needed from the respondent directly and sometimes confidentially. The researcher prepares a list of questions during the course of the interview. It allows the researcher to be sure that the proper understanding of the questions by the respondents through verbal and nonverbal feedback or reactions has taken place. The structured interview has an advantage in the global setting. The main disadvantage of this technique is its high cost.

Qualitative research differs concentrates on a particular situation where depth is more important than generalization. In qualitative research, research questions are posed rather than hypothesized. Concepts take the form of themes, and data take the form of words of participants from interviews and participation. There are a number of methods are associated with qualitative research such as participant observation and unstructured interviews.

Multi-method approach refers to the technique of integrating qualitative and quantitative data collection and analysis methods into one framework. It could be looked on as measuring an object or a relationship from different angles or viewpoints. The main reason for using multi-method approach is that measurement improves when diverse indicators are used. Having different measurements of a variable from diverse methods implies greater validity. Also, in a single research, measuring different variables might need the use of different methods.

Sampling involves choosing subjects who are in the best position to supply needed information. It is used when a limited category of people have the required criteria such as specific educational background, or they have the required information where they are expected to have expert knowledge. In such cases, probability sampling is purposeless and not useful.

4. Selecting the Research Approach

Selecting the most appropriate research approach to achieve the research aim depends on the specific research questions. Neuman (1997) explains "*It takes skill, practice, and creativity to match a research question to an appropriate data collection technique*"(Neuman, 1997: p. 154).

In making the choice of research approach to answer research questions, the following points suggested in similar ways to be taken as a guide:

1. Determine what type of data required (opinions, attitudes, perceptions, hard data, etc.)
2. Determine the depth or generalization needed.
3. Determine what resources are available (time, money, etc.)
4. Determine the degree of control and ability to manipulate variables.

In this research, because the researcher does not have the ability to control or manipulate variables affecting the successful implementation of knowledge management in educational organizations, experimental research design is excluded.

4.1. Methods of the Research

Kaplan and Duchon (1988) state that researchers develop categories and meanings from the data through an iterative process that starts by developing an initial understanding of the perspectives of those being studied. That understanding is examined and modified through cycles of additional data collection and analysis until coherent interpretation is reached. Thus, although qualitative methods provide less explanation of variance in statistical terms than quantitative methods. Quantitative methods provide information from which process theories and richer explanations of "how" and "why" processes and outcomes can be developed". In addition, Benbasat et al. (1987) consider case study approaches are appropriate for new research areas, and where respondents are of importance to the study.

The aims of this research are to produce a holistic model for the effective integration of the factors affecting the successful implementation of KM in educational organizations, produce a model that assist organizations in identifying their KM needs and requirements and propose guidelines for organizations to progress through their weak elements for successfully implementing KM. The lack of research that adopts this holistic perspective of KM makes this research a new area of research. In addition, the diversity and complexity of the factors that affect the successful implementation of KM call for the need to address "*how*" and "*why*" questions and to explore the "*what*". The theory adopted for this research recognizes that the factors which underpin this study; strategy, culture, people, technology, and organizational structure, need to be understood in depth. In addition, the proposed model introduces the interaction between the previously stated factors. This calls for a qualitative non-experimental approach that serves better in an in-depth study and in understanding a new phenomenon. Also, since the factors cover different aspects of the organization, this calls for the utilization of different methods of data collection. The research uses structured interviews, data collection, and document review.

It must be stated that different data collection methods prove to be more effective than others in the different interviews sessions. For example, some

participants were more reserved in allowing the researcher to review their methodology and historical data than others. In order to further generalize the model and achieve greater validity, the qualitative method is integrated with a quantitative questionnaire that resulted in a triangulation approach.

This research is exploring factors that affect successful implementation of KM in educational organizations, structured interviews with senior administrators and professors from Saudi universities have been participated in the research. This method was chosen because it allows the respondents to express their views freely in the manner they choose. It is also a good tool for data collection when in-depth understanding of a specific point is wanted (Neuman, 1997). It was conducted after completing the initial literature review where KM perspectives and approaches, life cycle models, frameworks and methodologies, and application to educational organizations are reviewed and the initial model is formed. The main objective of this step is to explore the issues concerning the successful implementation of KM and to identify gaps and factors stated in the literature concerning KM successful implementation in educational organizations.

In a global environment, qualitative research has proved to be fruitful and practical. In such a context, the qualitative approach is a very valuable method of data collection considering the possible limitations of other methods. Because of the variations in language and communication skills between respondents in the research conducted in the global setting, case study methods, such as face-to-face interviews. It allows the presence of the researcher to ensure proper understanding of the questions.

4.2. Steps of Conducting the Research

The steps of the research were as follows

1. Review of KM literature including KM perspectives and approaches, cycle models, frameworks and methodologies, benefits and application to educational organizations.
2. Preliminary research problem identification that resulted in outlining issues to be explored through exploratory work and further literature review.

3. Exploratory work conducted in different educational organizations.
4. Findings on the successful implementation of KM in educational organizations.
5. Review of more literature on critical factors for successful implementation of KM in educational organizations, and KM key issues.
6. Establishment KM model.
7. Conducting detailed interviews in the educational organizations to test and modify the model resulting from the previous step.
8. Presenting the final recommended model.
9. Further generalize the model and achieve greater validity with the use of a questionnaire.

4.3. Development of the Research Instruments

Following the initial literature review and the exploratory work, a preliminary KM model is established identifying potential factors affecting KM in educational organizations. These included strategic management, human resources, technology, organizational structure and culture as well as the types of learning knowledge and the KM life cycles. This led to further literature review to fulfil the need for better understanding of these factors and the relationships between them. Additionally, there is a need for further literature review to examine the practice of implementing KM in educational organizations through exploring key issues relating to KM such as performance measurement, e-learning and organizational learning. Guided by the KM framework and the exploratory interviews conducted, and having completed the literature review, a draft of KM model was constructed.

A questionnaire is also prepared during the course of the model development. This questionnaire was distributed to senior educational knowledge workers in an effort to further generalize and validate the model.

4.3.1. Questionnaire

During developing the KM model, a questionnaire was developed to solicit the opinions of knowledge workers in educational organizations on the agreement/disagreement of the various key factors proposed by the model and the status of KM in their organizations. This was an effort to further generalize and validate the model. A pilot questionnaire was presented to 30 senior managers/knowledge workers in four educational organizations to solicit their opinions on the questionnaire and examine the feedback. After obtaining the feedback from the knowledge workers on the pilot questionnaire and made minor necessary modifications, the KM questionnaire was sent to knowledge workers in 200 educational learning organizations. Despite the fact that two follow-up letters were sent to remind and encourage potential participants to contribute, only 143 completed questionnaires were received.

4.3.2. Structured Interview

The interviews take place after the literature review. The main objective is to explore the successful implementation of KM and to identify the gaps and factors stated in the literature concerning KM success in educational organizations. It assists in directing the subsequent literature review as well as setting the foundation for establishing the KM model. Additionally, the exploratory work has allowed for better planning of the case studies which tested and validated the KM model.

The interviews are conducted by interviewing professors at various universities. The main objective is to explore the factors that affect KM success, using a draft of a KM model inspired by the literature reviewed. This research also aims at exploring the issues concerning the possibilities to conduct the intended case studies, i.e. accessibility privileges and the type and status of KM in these organizations. They are aiming at obtaining opinions, views, and thoughts of issues relating to KM. The questions are put to the administrators in a discussion-like environment since it is thought to be a suitable way.

The literature review presented many factors that affect the successful implementation of KM. Those factors include information technology, strategic planning, organization culture and structure as well as people. In addition, the literature presented various KM life cycle frameworks and identified the types of

knowledge available in organizations. Those issues are the subject of verification in the exploratory study to find out what role they play in the practical world and whether other related issues exist.

5. The population of the Study

Al Qunfudah is a city in the Tihamah Region on the coast of the Red Sea. It is located on the southwestern border of Saudi Arabia. Its location is 290 km to the south from the holy city of Makkah. Its population is the fourth largest in the region with the estimation of 272,424 people divided between urban and coastal villages and abandonment. The city is originated at the beginning of the eighth century in 709. It received famous ocean-going trade caravans from Yemen to Syria and vice versa. As that port Qunfudah was an important port on the Red Sea coast where it contributed to receive large ships loaded from Yemen and the Levant. This port received Greek and Roman ocean-going ships to get the gold that exists in this region. It also received trade caravans and pilgrims to Makkah even after the takeover of the Saudi forces. The harbor was also receiving pilgrims from south of the Arabian Peninsula and pilgrims from South East Asia, particularly India pilgrims.

Education in Saudi Arabia is free at all levels. The school system is composed of elementary, intermediate, and secondary schools, at the secondary level, students are able to follow either a religious or a scientific track. Classes are segregated by gender. Higher education has expanded rapidly, with large numbers of Universities and colleges being founded particularly since 2000. Ministry of education has launched a new project by the of King Abdullah bin Abdul- Aziz project for developing Public Education *Tatweer*. *Tatweer* project is reported to have a budget of approximately US\$20 billion and focuses on moving teaching away from the traditional methods of memorization and rote learning towards encouraging students to analyze and problem-solving. It also aims to create an educational system which will provide a more modern and vocationally based training.

The Saudi Arabia's command economy is petroleum-based; roughly 75% of budget revenues and 90% of export earnings come from the oil industry. Among the challenges to Saudi economy is improving education to prepare youth for the workforce and providing them with employment.

The researcher selected Al Qunfudah educational zone for its unique structure. The people of this city are most likely live in normal situation. Most teachers are from the area who were educated in this city and work. This situation would help school with a static situation.

5.1. Pilot Survey

After being developed, the draft questionnaire should be pre-tested. The main purpose of conducting a pilot study is to detect and remedy any possible errors in questionnaire design prior to administering the main survey and typically, to refine and revise the questionnaire to help ensure the validity and reliability of the measures, as well as making it more user-friendly (Flynn et al. 1990). In addition, the pre-test can also be used to estimate response rates for the questionnaire and determine the sample size of the main study. Thus, the pilot study is widely recognized as an indispensable part of the development of survey instruments (Green *et al.* 1988). Van Teijlingen and Hundley (2002) summarize the main reasons why a pilot study is important. These reasons are as follows:

- Developing and testing adequacy of research instruments
- Assessing the feasibility of a (full-scale) study/survey
- Designing a research protocol
- Establishing whether the sampling frame and technique are effective
- Identifying logistical problems which might occur using proposed methods
- Estimating variability in outcomes to help determining sample sizes
- Collecting preliminary data
- Assessing the proposed data analysis techniques to uncover potential problems
- Developing a research question and research plan
- Convincing other stakeholders that the main study is worth supporting

The pretesting technique is important when measures are taken from various sources and applied in specific contexts. The measurement scales of constructs in this study were originally developed in the context of advanced developed or

newly industrialized countries viewed from a large company perspective. Therefore, some type of pretest needed to be performed to revise the measures in the context of Saudi Arabia

Convenience sampling is used to generate a sample for the pilot study with a recommended sample size of between 12 and 30. Thus, in this pilot survey, assuming a response rate of between 30 questionnaires were directly distributed to senior managers participating in the Global Knowledge Society Forum 2013 taken place in King Abdul Aziz Center for World Culture, ARAMCO Saudi Arabia, during the period of 9-10 December 2103.

To provide a preliminary evaluation and refinement of the measurement scales of the draft questionnaire, item-total correlations and principal component analysis were applied to check the construct validity and coefficient alpha was calculated to assess the reliability of composite variables. SPSS software version 15.0 was employed to conduct these analyses.

The validity of a measure is the degree to which it measures what it claims to measure. If a composite variable really does represent a single underlying property or concept, the component items will be homogenous - also referred to as internally consistent. The most common approach to estimate the homogeneity of a composite variable is to correlate every component item with the composite variable made up by adding the components together. This measure of homogeneity is referred to as the item-to-total correlation or item-total correlation. The rationale is that if each item is measuring the same thing as the total, then the scale will be homogenous or internally consistent.

Different from validity, the reliability of a measure is the consistency of the results each time the same thing is measured using Coefficient (or Cronbach's) alpha. Coefficient alpha is an index of the internal consistency of the items and also a useful estimate of reliability. Reliability will be high if the scale items are highly correlated. As a standard of reliability, values of coefficient alpha above 0.70 are considered to represent acceptable reliability, those above 0.80 to represent good reliability, and those above 0.90 to represent excellent reliability. However, in the early stages of a study or in exploratory research, a lower acceptable limit of 0.60 may be used.

5.2. Data Analysis Techniques

After data collection was completed, data analysis strategies were applied to analyze the collected data. The forms were firstly checked for the accuracy of data entry and for missing values. Descriptive statistics analyses were next conducted to provide an overview of the sample, summarizing demographic details of the participating organizations and respondents. The data were then checked for distribution of variables, using SPSS software version 15.0.

SPSS was employed to test the theoretical model. SEM is an extension or a unique combination of several multivariate techniques such as multiple regression analysis and factor analysis. Thus, SPSS allows the researcher to assess the contribution of each scale item, incorporate how well the scale measures the concept and estimate the relationship between the independent and dependent variables.

SPSS is the most efficient approach to simultaneously examine a series of inter-related dependence relationships among the measured variables and latent constructs as well as between several latent constructs. SPSS model is according to three major characteristics: (1) whether they allow the simultaneous estimation of multiple and inter-related dependence relationships; (2) their ability to represent unobserved concepts in these relationships and correct for measurement error in the estimation process, and (3) the model's ability to explain the entire set of relationships.

SPSS has become a popular and powerful multivariate technique in the social sciences due to its performance according to these criteria and, therefore, SPSS was the analytical tool used to address the research questions and hypotheses in this research.

5.3. Research instrument validity

Research instrument validity means "*making sure that instrument will measure what it supposes to measure*" (Assaf, 1995: p. 429), also validity means, the research instrument includes all the elements that must be included in the research of the hand, as well as the clarity of its items and words and the researcher has verified the validity of the questionnaire through the following:

5.3.1. External Validity of the research instrument (Audit Validity):

After completing the research instrument building which deals with "knowledge management processes to support and enhance education in learning environments for the transformation to the knowledge society", it was presented to the number of auditors to know their opinions about the instrument. They were asked to give their opinions about the clarity of the statements and the statements suitability to the research objectives, the statements validity and appropriateness. They were asked to suggest the amendments and proposals as to make the instrument more valid. Based on the amendments and proposals made by the auditors, the researcher conducting the necessary amendments agreed upon by the majority of the auditors. He modified some of the phrases and deleted others, until the research instrument finalized.

5.3.2. Internal Validity of the research instrument

A pilot study was conducted to find out the internal validity of the instrument, the researcher calculated Pearson correlation coefficient to know the inner validity of the questionnaire. The correlation coefficient between the items and the over all degree of each section is shown in the table below.

5.3.3. Research instruments

The researcher used a questionnaire and a structured interview to figure out the real case on knowledge management in educational organizations as to be ready to the transformation to knowledge society. It has been built by reference tool to study literature and previous studies related to the subject of research. The questionnaire consisted of two parts:

Part I: It addresses primary information of the population of the study, such as:

- Qualifications;
- Enrollment in Capacity Building Programs;
- Availability of the internet connection;
- Duties;
- Years of service

Part II: It consists of 97 items divided into five sections as follows:

- First section deals with Acquiring knowledge management processes in the learning environment, which consists of 25 items;
- Second section deals with knowledge production processes in the learning environment, which consists of 20 items;
- Third section deals with sorting knowledge processes in the learning environment, which consists of 13 items;
- Fourth section deals with the sharing of knowledge in the learning environment, which consists of the operations 20 items;
- Fifth section deals with the dissemination of knowledge of processes in the learning environment, which consists of 17 items.

Furthermore, he designed a structured interview consists of five questions.

The researcher used a number of statistical methods to achieve the objectives of the research and analyze of the data collected. He used a number of appropriate statistical methods using Statistical Package for Social Sciences Statistical Package for Social Sciences (SPSS).

The data were coded and computerized, the researcher needed to find out the rang of the items of the study (Low-high) which were used in the research. A calculation was done ($3-1 = 2$), and then dividing the result by the number of scale cells to obtain the correct cell length ($2/3 = 0.66$), this value to be added to the lower value in the scale (or to one) to determine the maximum degree, thus the length of the cells as follows:

- 1 - 1.66 represents the degree of responses (do not agree) to every item regardless of the section.
- 1.67 - 2.33 represents the degree of responses (do not know) to every item regardless of the section.
- 2.34 - 3.0 represents the degree of responses (agree) to every item regardless of the section.

5.3.4. Statistical measures were calculated as follows

1. Frequencies and percentages were calculated to find out the personal and functional characteristics of the population of the study.
2. Pearson correlation coefficient (Pearson correlation) to calculate the internal validity of the research instrument, as well as to make sure that relationships between the different sections of the study and the variables are internally valid.
3. Alpha Cronbach coefficient (Cronbach's Alpha) was applied to measure the reliability of the research instruments.
4. The "Mean" was also measured to figure out the degree of responses of the population of the study towards all items, though the mean is useful to get the orders of each item among other.
5. The use of standard deviation "Standard Deviation" was to figure out the deviation of the responses of the population of the research to every item and every section. It was noted that the standard deviation shows the dispersion in the study sample of each item and variables, expressions, as well as the responses of the main sections, The closer the value of zero centered responses and decreased dispersion between the scale.

Table (1)

Pearson Correlation coefficient of acquiring knowledge management in learning environment – High degree

Items	Correlation coefficient	Items	Correlation coefficient	Items	Correlation coefficient
1	.657**	10	.591**	19	.659**
2	.405**	11	.470**	20	.727**
3	.692**	12	.242**	21	.703**
4	.627**	13	.498**	22	.661**
5	.704**	14	.528**	23	.700**
6	.470**	15	.612**	24	.661**
7	.420**	16	.613**	25	.696**

8	.533**	17	.680**	-	-
9	.556**	18	.669**	-	-

** at level 0,01

Table (2)

Pearson Correlation coefficient of producing knowledge management in learning environment – High degree

Items	Correlation coefficient	Items	Correlation coefficient	Items	Correlation coefficient
1	.618**	8	.618**	15	.580**
2	.684**	9	.738**	16	.695**
3	.598**	10	.674**	17	.627**
4	.531**	11	.738**	18	.618**
5	.700**	12	.674**	19	.460**
6	.567**	13	.637**	20	.614**
7	.700**	14	.704**		

** at level 0,01

Table (3)

Pearson Correlation coefficient of storing knowledge management in learning environment – High degree

Items	Correlation coefficient	Items	Correlation coefficient
1	.586**	8	.730**
2	.724**	9	.680**
3	.715**	10	.598**
4	.720**	11	.626**
5	.678**	12	.649**
6	.643**	13	.650**

7	.701**	14	-
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** at level 0,01

Table (4)

Pearson Correlation coefficient of sharing knowledge management in learning environment – High degree

Items	Correlation coefficient	Items	Correlation coefficient	Items	Correlation coefficient
1	.502**	8	.585**	15	.687**
2	.507**	9	.659**	16	.737**
3	.548**	10	.691**	17	.729**
4	.641**	11	.704**	18	.718**
5	.663**	12	.552**	19	.673**
6	.618**	13	.613**	20	.671**
7	.671**	14	.579**		-

** at level 0,01

Table (5)

Pearson Correlation coefficient of disseminating knowledge management in learning environment – High degree

Items	Correlation coefficient	Items	Correlation coefficient	Items	Correlation coefficient
1	.504**	7	.655**	13	.798**
2	.696**	8	.746**	14	.756**
3	.642**	9	.761**	15	.709**
4	.657**	10	.641**	16	.683**
5	.699**	11	.738**	17	.719**
6	.689**	12	.747**	-	-

** at level 0,01

Tables (1,2,3,4,5,) illustrates that correlated at level (0.01) and this gives an indication of the high internal consistency coefficients, also refers to the sincerity of indicators and high enough to be valid in application of the current study.

5.3.5. Validity of the research instrument

The researcher measured the validity of the research instrument using alpha Cronbach reliability coefficient, and the table (6) shows the reliability coefficient for the variables measured:

Table (6)

Alpha Cronbach for measuring the reliability of the research instrument

NO.	Section	CORRELATION COEFFICIENT
1	Acquiring of knowledge management processes in the education environment	.919
2	Producing of knowledge management processes in the education environment	.930
3	Storing of knowledge management processes in the education environment	.897
4	Sharing of knowledge management processes in the education environment	.923
5	Disseminating of knowledge management processes in the education environment	.934
	Total Reliability	.979

Table (6) shows that the research instrument has a statically acceptable reliability, the overall reliability (alpha) (.979) which is a high reliable value. The reliability of the research instrument ranges from (0,897-0,934) the coloration coefficients are high enough to rely on to apply the instrument.

6. Main Study Sample Profile

6.1. the Qualifications

Table (7)

Distribution of the Population of the Research According to the Qualifications

Degrees	Frequencies	Percentage
Bachelor	117	81.8
Master	18	12.6
Doctorate	2	1.4
Others (Diplomas)	6	4.2
Total	143	100.0

Table (7) explains the distribution of the population of the research according to the qualifications. There are 117 participants of the population representing (81.8%) holding a Bachelor degree, while there are 18 of the population representing (12.6 %) holding a Master, there are six of the population representing (4.2%) holding Diplomas less than a Bachelor, and there are only two of the population representing (1.4%) holding a Doctorate degree.

Table (8)

**Distribution of the Population of the Study According to
the Capacity Building Programs enrolled in**

Period of Capacity Building Programs	Frequencies	Percentage
One week	15	10.5
Two weeks	18	12.6
One semester	11	7.7
One Academic year	6	4.2

Not receiving any program	93	65.0
Total	143	100.0

Table (8) illustrates that there are 93 participants of the population of research representing (65.0%) did not receive any program in the field of knowledge management, this is due to either the shortage the capacity building programs, or that the knowledge worker are the only ones in their schools so it difficult to allow them to join such programs, or to the knowledge workers themselves they do not want to join such programs. 18 participants of the population of research representing (12.6 %) have received training programs for a period of two weeks in the field of knowledge management, as there are 15 participants of the population of research representing (10.5%) received the training programs for a period of one week, and there are 11 participants of the population of study representing (7.7%) received the training programs for a semester, and only 6 participants of the population of research representing (4.2%) received training programs in the field of knowledge management for a period of one academic year.

Table (9)

**Distribution of the Population of the Study According to
the availability of the internet connection**

Internet Availability	Frequencies	Percentage
Internet available	131	91.6
No connection	12	8.4
Total	143	100.0

Table (9) shows the distribution of the population of the research according to availability of the internet. The majority of the population of the study 131 participants representing (91.6%) has connection to the Internet, while there are 12 participants representing (8.4%) do not have Internet connection.

6.2. Duties

Table (10)

Distribution of the Population of the Study According to their duties

Duty	Frequencies	Percentage
Education Resources Officer	37	25.9
Supervisor	65	45.5
IT Officer	7	4.9
Other	34	23.8
Total	143	100.0

Table (10) illustrates that there are 65 of the of the population of the research representing (45.5%) supervisors, while there are 37 of the of the population of the study representing (25.9%) are education resources officer, and there are 34 of the of the population of the research representing (23.8%) are doing other jobs but work in the field of knowledge management, and seven of the population of the research representing (4.9%) are IT officers.

6.3. Years of Experience

Table (11)

Distribution of the Population of the Study According to the Years of Experience

Years of Service	Frequencies	Percentage
Less than 5 years	16	11.2
6-10 years	27	18.9
11-15 years	34	23.8
More than 16	66	46.2
Total	143	100.0

Table (11) shows the distribution of the population of the research according to the years of service in the field. 66 of the participants of the population of the study representing (46.2%) are in service for more than 16 years, while there are 34 of the participants of the population of the research representing (23.8%) are in service for the period ranging between (11-15 years), and there are 27 of the participants of the population of the research representing (18.9%) are in service for the period ranging between (6-10 years), and 16 of the participants of the population of the research representing (11.2%) are in service for the period ranging between (less than five years).

Chapter VI

Research Result Analysis and Discussion

1. Introduction

The researcher in this chapter will deal with the outcome results to the research. This chapter deals with the results and the discussion of responses of the population research on the KM processes and the use of theoretical principles. The researcher calculates the frequencies, percentages and averages and standard deviation for answers of the population research. The researcher will conclude with the presentation of the educational model as a contribution of the research. He will present the recommendations and the suggested future researches.

2. Research Instruments Analysis

2.1. Questionnaire Analysis

Knowledge management is the planning, organizing, motivating, and controlling of people, processes and systems in the organization to ensure that its knowledge-related assets are improved and effectively employed. Knowledge-related assets include knowledge in the form of printed documents such as patents and manuals, knowledge stored in electronic repositories such as a “best-practices” database, educators’ knowledge about the best way to do their jobs, knowledge that is held by teams who have been working on focused problems and knowledge that is embedded in the organization’s products, processes and relationships.

The processes of KM involve knowledge acquisition, creation, refinement, storage, transfer, sharing, and utilization. The KM function in the organization operates these processes, develops methodologies and systems to support them, and motivates people to participate in them.

The goals of KM are the leveraging and improvement of the organization’s knowledge assets to effectuate better knowledge practices,

improved organizational behaviors, better decisions and improved organizational performance.

Although individuals certainly can personally perform each of the KM processes, KM is largely an organizational activity that focuses on what administrators can do to enable KM’s goals to be achieved, how they can motivate individuals to participate in achieving them and how they can create social processes that will facilitate KM success.

Social processes include communities of practice – self-organizing groups of people who share a common interest – and expert networks – networks that are established to allow those with less expertise to contact those with greater expertise. Such social processes are necessary because while knowledge initially exists in the mind of an individual, for KM to be successful, knowledge must usually be transmitted through social groups, teams and networks. Therefore, KM processes are quite people-intensive, and less technology-intensive than most people might believe, although a modern knowledge-enabled enterprise must support KM with appropriate information and communications technology (King, 2008).

2.1.1. Acquiring Knowledge in the Education Environment

Table (12)

Acquiring knowledge in the Learning Environment

(Frequencies, Percentages and Standard Deviation)

N	Items	Mean	St.deviation	Percentage	Ranking
1	Knowledge workers know what information they need to achieve their duties/goals.	2.47	0.78	82.3	21
2	If knowledge workers are asked “what are the most important information needed?”, they would always	2.41	0.73	80.3	24

	give the same answer.				
3	Knowledge workers look for existing information in order to avoid repeating the previous efforts.	2.55	0.72	84.9	13
4	Knowledge workers know from each other who knows what.	2.45	0.73	81.6	23
5	Knowledge workers identify the available information.	2.65	0.60	88.2	3
6	The structure of our community of practices reflects the knowledge cycle.	2.56	0.63	85.2	11
7	We have a sophisticated knowledge cycle system in which everyone can easily find the existed information.	2.65	0.57	88.2	2
8	Knowledge workers often question which information needed to do current and future tasks.	2.52	0.69	83.9	16
9	Knowledge workers know what new knowlwdge they acquire.	2.59	0.64	86.2	9
10	Knowledge workers recognize that the basic aim of knowledge management is to leverage knowledge to the organization's advantage.	2.71	0.60	90.2	1
11	Knowledge workers recognize that the tacit knowledge is difficult to articulate/ to put in words.	2.41	0.73	80.3	24 Repeated
12	Knowledge workers recognize that the explicit knowledge is represented in content that has been captured in tangible form	2.58	0.69	85.9	10

	such as books, articles etc.				
13	New information is more attractive to be learned regardless of its contribution to the organization.	2.62	0.69	87.2	6
14	Knowledge workers believe that both types of knowledge (tacit and explicit) are significant to the future development.	2.49	0.71	82.9	18
15	Knowledge workers encourage students to improve their performance by learning new knowledge.	2.62	0.67	87.2	5
16	Knowledge workers assist students to achieve their development goal.	2.62	0.66	87.2	4
17	Knowledge workers encourage students to identify their interests or deficiencies.	2.60	0.66	86.6	8
18	Knowledge workers encourage students to evaluate their recent learning experience.	2.48	0.73	82.6	19
19	Knowledge workers know current and future responsibilities for their career development.	2.53	0.69	84.2	15
20	Knowledge workers know what kind of knowledge is helpful to work and life.	2.61	0.63	86.9	7
21	Knowledge workers know whether the acquired learning information or materials are what needed and their practical effects in learning.	2.55	0.67	84.9	12
22	Knowledge workers can compare the acquired	2.47	0.70	82.3	20

	knowledge and determine their familiarities to the learning situation.				
23	Knowledge workers can assess learning outcomes and figure out what still needed to learn.	2.45	0.69	81.6	22
24	Knowledge workers assess whether they have achieved the expectation.	2.54	0.66	84.6	14
25	Knowledge workers know the efficiency of acquired knowledge.	2.51	0.71	83.6	17
Overall Mean		2.55	0.40	84.9	-

1. Item (10), (Knowledge workers recognize that the basic aim of knowledge management is to leverage knowledge to the organization's advantage.), came first among other items (2.71 ± 0.60), and this indicates that there is a consent among the population of the research that the primary goal of knowledge management is to take advantage of knowledge for the benefit of the work.
2. Item (7), (We have a sophisticated knowledge cycle system in which everyone can easily find the existed information) comes the second item among other items (2.65 ± 0.57) this indicates that there is a consent among the population of the research that a sophisticated knowledge cycle system in which everyone can easily find the existed information.
3. Item (5), (Knowledge workers identify the available information) was ranked as a third item among other (2.65 ± 0.60) this indicates that there is a consent among the population of the research that knowledge workers specify the real available knowledge.
4. Item (16), (Knowledge workers assist students to achieve their development goal) was ranked the fourth item among the other items on the section of acquiring knowledge management average of (2.62 ± 0.66) this indicates that there is a consent among the population of the research that Knowledge workers help students achieve their developmental goal.

5. Item (15), (Knowledge workers encourage students to improve their performance by learning new knowledge) was ranked as the fifth item among other items on the section of acquiring knowledge management on the of average (2.62 ± 0.67) this indicates that there is a consent among the population of the research that worker knowledge encourage students to improve their performance by learning new knowledge.
6. Item (1) (Knowledge workers know what information they need to achieve their duties/goals) came in the twenty-first position among the other items of the section of acquiring knowledge management within by the mean of (2.47 ± 0.78) this indicates that there is a consent among the population of the research that knowledge workers know fully the knowledge they need to perform their duties to achieve their goals.
7. Item (23), (Knowledge workers can assess learning outcomes and figure out what still needed to learn) was ranked as item in number twenty-second on the section of acquiring knowledge management by the mean of (2.45 ± 0.69) this indicates that there is a consent among the population of the research in performing a continuous assessment of the outcome of learning the identification of new needs.
8. Item (4), (Knowledge workers know from each other who knows what) was ranked as item in number twenty-second on the section of Acquiring knowledge management by the mean of (2.45 ± 0.73) this indicates that there is a consent among the population of the research knowledge workers realize sufficient capabilities their colleagues.
9. Item (2), (If knowledge workers are asked “what are the most important information needed?”, they would always give the same answer) was ranked as item in number twenty-four on the section of Acquiring knowledge management by the mean of (2.41 ± 0.73) this indicates that there is a consent among the population of the research knowledge workers give the same answer give the same answer if asked "What is the most important information needed to perform a specific task.
10. Item (11), (Knowledge workers recognize that the tacit knowledge is difficult to articulate/ to put in words) was ranked as item in number twenty-four on the section of acquiring knowledge management by the mean of (2.41

± 0.73) this indicates that there is a consent among the population of the research knowledge workers knowledge workers realize that tacit knowledge is difficult to express in words.

2.1.2. Producing Knowledge in Learning Environment

Table (13)

Producing knowledge in the Learning Environment
(Frequencies, Percentages and Standard Deviation)

N	Items	Mean	St.deviation	Percentage	Ranking
1	Knowledge workers adopt explicit strategies for knowledge development e.g. (R& D).	2.59	0.66	86.2	9
2	Knowledge workers use clear techniques for acquiring new knowledge.	2.68	0.59	89.2	3
3	Knowledge workers develop networks to create knowledge.	2.48	0.69	82.6	19
4	Knowledge workers focus on learning and exploring new ways of creating new knowledge.	2.48	0.67	82.6	18
5	Knowledge workers adapt innovative processes to create knowledge.	2.51	0.69	83.6	15
6	Knowledge workers develop ways to support the creation of new knowledge (e.g. via training programs, duty rotation).	2.58	0.64	85.9	10
7	Knowledge workers use the right techniques to capture new ideas and experiences.	2.51	0.69	83.6	15 مكرر
8	The culture of exploring new ideas has become a predominant culture so " our	2.29	0.83	76.3	20

	students can create new knowledge".						
9	Knowledge workers should effectively create new knowledge when needed using available resources.	2.58	0.69	85.9	12		
10	Knowledge workers are useful to any community of practice.	2.63	0.61	87.6	7		
11	Newly content created is appreciated by everyone in our community of practice.	2.58	0.68	85.9	11		
12	Knowledge workers arrange learning tasks based on mandatory duties.	2.51	0.69	83.6	15	مكرر	
13	Once, a duty is mandated knowledge workers try to get the required knowledge to succeed.	2.60	0.66	86.6	8		
14	Knowledge workers adapt new methods and techniques adjusted to new learning situations.	2.58	0.67	85.9	13		
15	Knowledge workers consciously finish learning tasks accordingly with established plan.	2.52	0.71	83.9	14		
16	Knowledge workers' plan includes: (i) the kind of learning activities	2.66	2.64	0.71	87.9	6	
	(ii) the type of acquired knowledge	2.64					0.62
	(iii) the time needed for completing the task.	2.61					0.66
17	Knowledge workers use suitable means to acquire necessary knowledge.	2.77	0.57	92.2	1		
18	New technology assist knowledge workers to acquire the learning knowledge.	2.69	0.61	89.6	2		
19	Knowledge workers work in team to create new knowledge.	2.64	0.61	87.9	5		
20	Knowledge workers encourage students to consult different resources i.e. books, newspapers, radios, or televisions	2.65	0.63	88.2	4		

	to get necessary knowledge.				
Overall Mean		2.58	0.42	83.3	-

1. Item (17), (Knowledge workers use suitable means to acquire necessary knowledge.), came first among other items (2.77 ± 0.57), and this indicates that there is a consent among the population of the research that knowledge workers use the appropriate means to acquire the necessary knowledge.
2. Item (18), (New technology assist knowledge workers to acquire the learning knowledge.), came the second among other items (2.69 ± 0.61), and this indicates that there is a consent among the population of the research that knowledge workers rely on the acquisition of knowledge through modern technology.
3. Item (2), (Knowledge workers use clear techniques for acquiring new knowledge.), came the third among other items (2.68 ± 0.59), and this indicates that there is a consent among the population of the research that knowledge workers use clear techniques to acquire modern knowledge.
4. Item (20), (Knowledge workers encourage students to consultate different resources i.e. books, newspapers, radios, or televisions to get necessary knowledge.), came the fourth among other items (2.65 ± 0.63), and this shows that there is a consent among the population of the research that knowledge workers encourage students to produce knowledge using various resources such as books, the Internet, newspapers and other media and means of social communication. Item (19), (Knowledge workers work in team to create new knowledge.), came the fifth among other items (2.64 ± 0.61), and this shows that there is a consent among the population of the research that knowledge workers work in teams to create new knowledge.
6. Item (7), (Knowledge workers use the right techniques to capture new ideas and experiences.), came the fifteenth among other items (2.51 ± 0.69), and this indicates that there is a consent among the population of the research that knowledge workers use the right techniques to capture new ideas and experiences.

7. Item (12), (Knowledge workers arrange learning tasks based on mandatory duties.) came the fifteenth consecutively among other items (2.51 ± 0.69), and this indicates that there is a consent among the population of the research that knowledge workers arrange learning tasks based on mandatory duties.
8. Item (4), (Knowledge workers focus on learning and exploring new ways of creating new knowledge.) came the eighteenth among other items (2.48 ± 0.67), and this indicates that there is a consent among the population of the study that knowledge workers focus on learning and exploring new ways of creating new knowledge. Yet the percentage of 57.3 % is recorded which mean that participants are not fully implemented such technique.
9. Item (3), (Knowledge workers develop networks to create knowledge.) came the nineteenth among other items (2.48 ± 0.69), and this indicates that there is a consent among the population of the research that knowledge workers develop networks to create knowledge.
10. Item (8), (The culture of exploring new ideas has become a predominant culture so " our students can create new knowledge".) came the twentieth among other items (2.29 ± 0.83), and this indicates that there is a consent among the population of the research that there is a lack of knowledge among the population of the research if there is a prevalent culture to discover new ideas or not which is obvious in the percentage of the participants 53.1%.

2.1.3. Storing Knowledge in Learning Environment

Table (14)
Storing knowledge in the Learning Environment
(Frequencies, Percentages and Standard Deviation)

N	Items	Mean	St. deviation	Ranking
1	Knowledge workers have clear strategies for storing knowledge assets.	2.48	0.71	11
2	Knowledge workers sure about what kind	2.52	0.67	6

	of knowledge should be stored.			
3	Knowledge workers are encouraged to capture experiences and lessons learned from best practices to make them accessible to others.	2.58	0.69	3
4	Knowledge workers spend enough time and efforts to contribute to the education's knowledge database.	2.50	0.72	8
5	In our learning environment, there is a clear strategy for storing knowledge for future usage.	2.56	0.66	4
6	In our learning environment, knowledge workers are given roles and responsibilities for storage and maintenance of knowledge.	2.52	0.64	5
7	In our learning environment, knowledge workers have the right systems like databases, intranets, in which we can easily store our documented knowledge.	2.52	0.69	7
8	Knowledge workers make their contribution to the organization's knowledge base.	2.48	0.68	10
9	Knowledge workers' personal knowledge is made accessible for others.	2.45	0.69	12
10	Information Communication Technology ICT techniques assist knowledge workers to sort leaning materials.	2.60	0.61	1
11	Tangible materials such as books are stored by category, they could be found out quickly.	2.58	0.67	2
12	Knowledge workers usually understand and retell what they learned in their own way.	2.49	0.70	9
13	Knowledge workers regularly check their learning progress, clearing the difference between current progress and original plan and analyzing the reason.	2.43	0.73	13
Overall Mean		2.52	0.46	-

Item (10), (Information Communication Technology ICT techniques assist knowledge workers to sort leaning materials.) came the first among other items (2.60 ± 0.61), and this indicates that there is a consent among the population of the study that the knowledge workers recognize that the information communication technology ICT techniques assist knowledge workers to sort leaning materials.

1. Item (11), (Tangible materials such as books are stored by category, they could be found out quickly.) came the second among other items (2.58 ± 0.67), and this indicates that there is a consent among the population of the research that the knowledge workers use the global classification systems (Dewey classification system) to facilitate the retrieve of information quickly.
2. Item (11), (Knowledge workers are encouraged to capture experiences and lessons learned from best practices to make them accessible to others.) came the third among other items (2.58 ± 0.69), and this indicates that there is a consent among the population of the research that the knowledge workers capture experiences and lessons learned from best practices to make them accessible to others.
3. Item (5), (In our learning environment, there is a clear strategy for storing knowledge for future usage.) came the fourth among other items (2.56 ± 0.66), and this indicates that there is a consent among the population of the research that the knowledge workers know that they have a clear strategy for storing knowledge for future usage.
4. Item (6), (In our learning environment, knowledge workers are given roles and responsibilities for storage and maintenance of knowledge.) came the fifth among other items (2.52 ± 0.64), and this indicates that there is a consent among the population of the research that the knowledge workers are given roles and responsibilities for storage and maintenance of knowledge.
5. Item (12), (Knowledge workers usually understand and retell what they learned in their own way.) came the ninth among other items (2.49 ± 0.70), and this indicates that there is a consent among the population of the research that the knowledge workers understand and retell what they learned in their own way.

6. Item (8), (Knowledge workers make their contribution to the organization's knowledge base.) came the tenth among other items (2.48 ± 0.68), and this indicates that there is a consent among the population of the research that the knowledge workers make their contribution to the organization's knowledge base .
7. Item (1), (Knowledge workers have clear strategies for storing knowledge assets.) came the eleventh among other items (2.48 ± 0.71), and this indicates that there is a consent among the population of the research that the knowledge workers have clear strategies for storing knowledge.
8. Item (9), (Knowledge workers' personal knowledge is made accessible for others.) came the twelfth among other items (2.45 ± 0.69), and this indicates that there is a consent among the population of the research that the knowledge workers recognize that have the personal knowledge is made accessible for others.
9. Item (13), (Knowledge workers regularly check their learning progress, clearing the difference between current progress and original plan and analyzing the reason.) came the thirteenth among other items (2.43 ± 0.73), and this indicates that there is a consent among the population of the research that the knowledge workers the check their learning progress, clearing the difference between current progress and original plan and analyzing the reason.

2.1.4. Sharing Knowledge in Learning Environment

Table (15)

**Sharing knowledge in the Learning Environment
(Frequencies, Percentages and Standard Deviation)**

N	Items	Mean	St.deviation	Percentage	Ranking
1	The sharing knowledge strategy of our organization	2.76	0.53	91.9	1

	can be realized when knowledge is shared.				
2	In our community of practices, knowledge sharing applies more than possessing knowledge.	2.52	0.71	83.9	12
3	Regulations in our community of practice motivates knowledge workers to share knowledge by building trust, giving incentives, making available time and resources.	2.50	0.71	83.3	15
4	Knowledge workers spend enough time to share ideas and experiences with each other's, even if this is not directly relevant to the existing duty.	2.50	0.69	83.3	14
5	Knowledge workers know how they can optimally share their knowledge with each other.	2.43	0.66	80.9	19
6	The way knowledge workers are structured overcomes any barriers for knowledge sharing.	2.36	0.72	78.6	20
7	Knowledge workers have the right tools, like databases, intranets, team-rooms and e-mail groups to support knowledge sharing.	2.52	0.71	83.9	12 Repeated
8	Knowledge workers are encouraged to share their ideas and experiences with others colleagues.	2.58	0.63	85.9	4
9	By sharing my knowledge I have made a significant contribution to the organization.	2.45	0.68	81.6	18
10	Knowledge workers consciously develops	2.46	0.68	81.9	17

	knowledge sharing habit.				
11	Knowledge workers adapt to the rapid social changes and fierce social competition.	2.47	0.72	82.3	16
12	Knowledge workers participate in learning activities organized by school, working unit or community, such as training, lecture and communication.	2.58	0.68	85.9	5
13	Knowledge workers understand that there is a lot of working and living knowledge for them to learn and know.	2.64	0.60	87.9	2
14	Knowledge workers modify learning contents and materials according to the learning situations.	2.54	0.67	84.6	11
15	Knowledge workers make flexible adjustment to learning plans according to current learning progress and objective conditions.	2.56	0.70	85.2	9
16	Knowledge workers discuss with friends and colleagues new learning experience.	2.57	0.61	85.6	6
17	Knowledge workers identify the validity of the acquired learning knowledge "applicability & practicality".	2.55	0.66	84.9	10
18	Knowledge workers disseminate more knowledge based on best practices.	2.57	0.64	85.6	7
19	Knowledge workers are able to distinguish the quality of the new acquired knowledge.	2.64	0.61	87.9	3
20	Knowledge workers have more access first hand experienced	2.57	0.66	85.6	8

	knowledge.				
Overall Mean		2.54	0.42	84.6	-

1. Item (1), (The sharing knowledge strategy of our organization can be realized when knowledge is shared.) came the first among other items (2.76 ± 0.53), and this indicates that there is a consent among the population of the research that the knowledge workers recognize that much of knowledge can be achieved on the dissemination of knowledge in the educational environment strategy through clear mechanisms for the sharing of knowledge.
2. Item (19), (Knowledge workers are able to distinguish the quality of the new acquired knowledge.) came the thirteenth among other items (2.64 ± 0.61), and this indicates that there is a consent among the population of the research that the knowledge workers recognize that much of knowledge can be achieved on the dissemination of knowledge in the educational environment can determine the quality of the new gained knowledge.
3. Item (8), (Knowledge workers are encouraged to share their ideas and experiences with others colleagues.) came the fourth among other items (2.58 ± 0.63), and this indicates that there is a consent among the population of the research that the knowledge workers are encouraged and encouraging to share their ideas and experiences with others colleagues.
4. Item (12), (Knowledge workers participate in learning activities organized by school, working unit or community, such as training, lecture and communication.) came the fifth among other items (2.58 ± 0.68), and this indicates that there is a consent among the population of the research that the knowledge workers participate in learning activities organized by school, working unit or community, such as training, lecture and communication.
5. Item (11), (Knowledge workers adapt to the rapid social changes and fierce social competition.) came the sixteenth among other items (2.47 ± 0.72), and this indicates that there is a consent among the population of the research that the knowledge workers adapt to the rapid social changes and fierce social competition.

6. Item (10), (Knowledge workers consciously develops knowledge sharing habit.) came the sixteenth among other items (2.46 ± 0.68), and this indicates that there is a consent among the population of the research that the knowledge workers develops knowledge sharing habit consciously.
7. Item (9), (By sharing my knowledge I have made a significant contribution to the organization.) came the eighteenth among other items (2.45 ± 0.68), and this indicates that there is a consent among the population of the research that the knowledge workers recognize that they made a significant contribution to the organization.
8. Item (5), (Knowledge workers know how they can optimally share their knowledge with each other.) came the nineteenth among other items (2.43 ± 0.66), and this indicates that there is a consent among the population of the research that the knowledge workers know how they can optimally share their knowledge with each other. .
9. Item (6), (The way knowledge workers are structured overcomes any barriers for knowledge sharing) came the twenty-first among other items (2.36 ± 0.72), and this indicates that there is a consent among the population of the research that the knowledge workers know how they can optimally share their knowledge with each other structured overcomes any barriers for knowledge sharing.

2.1.5. Disseminating Knowledge in Learning Environment

Table (16)

Disseminating knowledge in the Learning Environment

(Frequencies, Percentages and Standard Deviation)

N	Items	Mean	St.deviation	Percentage	Ranking
1	Knowledge workers have systematic approaches to make optimal use of knowledge in their community processes.	2.52	0.68	83.9	14

2	Knowledge workers have clear strategies on how they can make optimal use of their knowledge.	2.57	0.62	85.6	5
3	Knowledge workers are encouraged to make use of the available knowledge.	2.58	0.67	85.9	3
4	Knowledge workers apply available knowledge to improve jobs.	2.61	0.63	86.9	2
5	Knowledge workers apply available knowledge to innovate new solutions.	2.61	0.62	86.9	1
6	Knowledge workers know how to disseminate available knowledge among students.	2.56	0.71	85.2	9
7	Knowledge workers know how to link knowledge to the duties, processes and activities.	2.54	0.69	84.6	13
8	Knowledge workers develop systems to make it easier to students to use of available knowledge.	2.54	0.68	84.6	12
9	Knowledge workers are flexible in applying each other's knowledge, to be more efficient and effective.	2.50	0.68	83.3	15
10	Knowledge workers prefer to use other people's ideas and suggestions, instead of figuring out the needed experience.	2.48	0.68	82.6	16
11	Knowledge workers can make appropriate learning goals (short/long-term goals).	2.56	0.63	85.2	8
12	Knowledge workers come up with various ways to improve their efficiency.	2.57	0.69	85.6	7

13	Knowledge workers validate their techniques to assess their learning outcomes.	2.55	0.71	84.9	11
14	Before disseminating new, knowledge workers select suitable content based on their experiences.	2.57	0.67	85.6	6
15	Knowledge workers can give justifications for the efficiency of the new knowledge..	2.45	0.73	81.6	17
16	Knowledge workers can make full use of acquired information to assist achieving particular learning goals.	2.57	0.61	85.6	4
17	Knowledge workers collaborate and integrate approaches to create, capture and use of intellectual assets.	2.55	0.68	84.9	10
Overall Mean		2.55	0.47	84.9	-

1. Item (5), (Knowledge workers apply available knowledge to innovate new solutions.) came the twenty-first among other items (2.61 ± 0.62), and this indicates that there is a consent among the population of the research that the knowledge workers apply available knowledge to innovate new solutions.
2. Item (4), (Knowledge workers apply available knowledge to improve jobs.) came the second among other items (2.61 ± 0.63), and this indicates that there is a consent among the population of the research that the knowledge workers apply available knowledge to improve jobs.
3. Item (3), (Knowledge workers are encouraged to make use of the available knowledge.) came the third among other items (2.58 ± 0.67), and this indicates that there is a consent among the population of the research that the knowledge workers are encouraged to make use of the available knowledge.
4. Item (16), (Knowledge workers can make full use of acquired information to assist achieving particular learning goals.) came the fourth among other items (2.57 ± 0.61), and this indicates that there is a consent among the population

of the study that the knowledge workers can make full use of acquired information to assist achieving particular learning goals.

5. Item (2), (Knowledge workers have clear strategies on how they can make optimal use of their knowledge.) came the fifth among other items (2.57 ± 0.62), and this indicates that there is a consent among the population of the research that the knowledge workers have clear strategies on how they can make optimal use of their knowledge.
6. Item (7), (Knowledge workers know how to link knowledge to the duties, processes and activities.) came the thirteenth among other items (2.57 ± 0.62), and this indicates that there is a consent among the population of the research that the knowledge workers know how to link knowledge to the duties, processes and activities.
7. Item (1), (Knowledge workers have systematic approaches to make optimal use of knowledge in their community processes.) came the fourteenth among other items (2.52 ± 0.68), and this indicates that there is a consent among the population of the research that the knowledge workers have systematic approaches to make optimal use of knowledge in their community processes.
8. Item (9), (Knowledge workers are flexible in applying each other's knowledge, to be more efficient and effective.) came the fourteenth among other items (2.50 ± 0.68), and this indicates that there is a consent among the population of the research that the knowledge workers are flexible in applying each other's knowledge, to be more efficient and effective.
9. Item (10), (Knowledge workers prefer to use other people's ideas and suggestions, instead of figuring out the needed experience.) came the fourteenth among other items (2.48 ± 0.68), and this indicates that there is a consent among the population of the research that the knowledge workers prefer to use other people's ideas and suggestions, instead of figuring out the needed experience.
10. Item (15), (Knowledge workers can give justifications for the efficiency of the new knowledge.) came the seventeenth among other items (2.45 ± 0.73), and this indicates that there is a consent among the population of the research that the knowledge workers can give justifications for the efficiency of the new knowledge.

2.2. Interviews Analysis

The researcher has conducted interviews with twelve professors to figure out the status of the implementation of knowledge management approaches at university learning environments. He posted five questions as follows:

1. How does your organization create a culture of sharing knowledge?
2. How does your organization help professors to utilize new knowledge in new learning situations?
3. Does your organization have a strategy for capturing a new knowledge?
4. What is the role of the professor for creativity and innovation in education?
5. How do you like blended learning in your organization?

The analysis of the data collected is to understand the existing implementation of KM in learning organizations. The researcher made content analysis that involves coding and classifying data to make sense of the data collected and to highlight the important findings. Hence, he evaluated the independent variable (the KM procedures and techniques, etc.) on the dependent variable(s) (the practices, behavior, conditions, which meant to change).

1. How does your organization create a culture of sharing knowledge?

Organization's efforts to create a culture of sharing knowledge are seen by the participants in the interview, as follows:

a) Difficulties of sharing knowledge:

Insecurity in One's Job

The real difficulties of creating the culture of sharing knowledge in educational organizations come from the feeling of the knowledge workers that they identify as distrust of management and organizational climate, arguing that people will find out you aren't perfect. Also, individuals face difficulties in accessing the knowledge they need, because sometimes other people who have such knowledge refuse to share it with them. A participant put it directly that *"You'll want to work with this group to get consensus, to reassure them and dissuade any concerns about sharing information and ideas. You'll also want to incentivize their participation "*. So, the culture of knowledge hoarding belief that sharing knowledge would affect

their occupation status. In contrary, only three of the participants thought that sharing academic knowledge would threat their professional status.

No organizational STRATEGY

One practical difficulty that most organizations do not have strategy for sharing knowledge. In universities, knowledge is dependent on context, for example expertise learnt and applied in one part of the university is not leveraged in another. A professor said *"Our problem as an organization is that we don't know what we know. Large global or even small geographically dispersed organizations do not know what they know"*. The majority of the interviewees think that as much of 50% of what people know 5 years ago is probably obsolete today, arguing that *"Expertise learnt and applied in one part of the organization is not leveraged in another. Accelerating change - technology, business and social."* Of course, it is difficult to toss all large organizations into a single bucket. But it needs to create a strategy of sharing cultures depend on the policies and experienced histories." *As things change so does our knowledge base erode – in our specialty where new inventions recorded everyday accessible respiratory available everyone."* Participants were concerned about sharing their knowledge and expressed their fear that they lose their jobs. They put it very clearly that *"So the idea of knowledge hoarding to protect one's job is present wherever employees have witnessed downsizing, firings, or layoffs that the employees have regarded as arbitrary or capricious"* another participant said *"If I'm the only one who knows how to do this, 'they' can never fire me"*.

b) Opportunities of sharing knowledge:

Leading thinkers

The majority of the participants believe that creating the culture of sharing knowledge in educational organizations would lead thinkers to make their organization to a thinking tank organization. They emphasize the fostering of a mindset *"sharing is power"*. They argue that technology makes sharing possible to identify the source knowledge and to communicate the benefits from the efforts of others, trust employees to think *"Particularly at a research university, we have a responsibility to create situations where students benefit from the abundance of*

*research that is taking place". They consider sharing is the most powerful attribute for knowledge management. On the other hand, two of the professors interviewed consider sharing knowledge may create the ongoing demand training and personal development and career progression which might require their organization to look for more resources to fund such programs " *Experiential learning provides one approach to ameliorating this criticism and mining the richness of the research taking place at the university".**

Becoming more PROFESSIONAL and EFFICIENT

Most of the participants think that sharing knowledge takes place in best communities. It makes collaboration, learning and knowledge strategies. They argue that when professors share their knowledge with their colleagues, the entire educational organization becomes more powerful and more information and knowledge will be created and much more will be reused participants emphasize that *"The concept of practicing and deepening knowledge is brought into focus by the distinction between declarative and procedural knowledge".* Sharing knowledge helps to do jobs more effectively and brings more personal recognition. Yet, there are some raise the concern that the creation and application of a growing share of global trade from the traditional. Such concern is based on *"Procedural knowledge is oriented toward skills, strategies, or processes. The following are examples of procedural knowledge commonly taught in school: (e.g. Reading a contour map, Editing a composition for overall logic, Sounding out an unrecognized word while reading)".* In conclusion, all participants support the higher education mission to bridge the gap between theory and practice and the educational environment needs to intentionally create connections different approaches.

With opportunities one can notice that interviewees are more strategically thinking *"Collaboration is needed for enhancing the working environment, hence being open with colleagues sharing with them knowledge, helps you achieve your objectives"; "Experiential learning provides one approach to ameliorating this criticism and mining the richness of the research taking place at the university".*

c) Practices of sharing knowledge:

Culture of Productivity

The holistic nature of knowledge management is about meeting the objectives, but knowledge management is not an end in itself, it is about sharing knowledge and putting that knowledge to use. The reasons for creating the culture of sharing knowledge are (i) knowledge is short-lived, if you do not make use of your knowledge then it rapidly loses its value, (ii) people gain more than they lose. Sharing knowledge is a synergistic process – people get more out than they put in. One of the participant argues that *"If I share a product idea or a way of doing things with another person – then just the act of putting my idea into words or writing will help me shape and improve that idea"*. Another one contends that *"If I get into dialogue with the other person then I'll benefit from their knowledge, from their unique insights and improve my ideas further"*. Moreover, thinking skills can be enhanced through encourage people to share their knowledge quickly and more effectively *"Look for people who have demonstrated innovative thinking, who are quick to express ideas at meetings, or who have been identified as experts by others"*.

Technology Assistance

The impact of technology might be low unless an organization requires a collaborative effort. IT plays a crucial transformational role in changing the culture to knowledge sharing *"...make knowledge sharing a reality"*, to facilitate the capture of knowledge that can support sharing atmosphere, and track the outcomes in order to optimize your methods in the future. It makes sharing knowledge or working collaboratively a reality. Technology enhances knowledge sharing quickly and effectively and also posting knowledge for access. Sharing takes many forms, from verbal or digital conversation, to explicitly sending information, to simply providing access to information created by others.

One can conclude that organizational culture is a tacit knowledge that shape not only our thinking but also people's behavior and perception of the learning environment. It establishes a set of guidelines by which members of the organization work and how those organizations are structured. Culture is defined in *Webster's New Collegiate Dictionary* as *"the integrated pattern of human behavior that includes thought, speech, action, and artefacts and depends on man's capacity for learning and transmitting knowledge to succeeding generations."* *"Sharing is necessary to*

move beyond to create and reuse more of your valuable knowledge and information. Sharing your knowledge, you gain more than you lose. Sharing knowledge is a synergistic process. For example, if I get into dialogue with the other person then I'll benefit from their knowledge, from their unique insights and improve my ideas further".

They consider having a strategy as an enabling access to foster a sharing culture. It leads to the reuse of the organization's knowledge and information. People become eager for information and knowledge that once they create it or find it, they keep it to themselves in a special spot they think they will remember. Each employee tries to control his own access to knowledge.

The interviewees are aiming at making knowledge sharing the norm, to encourage people to work together more effectively, to collaborate and to share - ultimately to make organizational knowledge more productive, taking into consideration that sharing knowledge and information – not just information; the purpose of knowledge sharing is to help the educational organization to meet its objectives. We are not doing it for its own sake. They acknowledged that changing a culture is tough, *"it means seeing the world in a different way. It means revealing the tacit understanding that "knowledge is power"*.

The shift from a knowledge hoarding culture to a knowledge sharing culture give a context for the issues of knowledge sharing. Motivating positive change can be significant change in terms of its management policies and choices to adopt a policy of knowledge sharing, and maintain the suitable level of innovation to create atmospheres in which sharing knowledge is 'safe'.

The majority of participants emphasized that the argument that *"the problem is that we don't know what we know; expertise learnt and applied in one part of the learning organization is not leveraged in another"*. This is simply because educational organizations are large and diversity. Finally, they believe that there is a need to create a framework for sharing, both socially and technologically where the atmosphere is strongly conducive to sharing. You'll need to openly and publicly proclaim this as a priority both for the organization and for individuals.

2- How does your organization help professors to utilize new knowledge in new learning situations?

a) Difficulty of utilization of new knowledge in new learning situations:

Motivation Lose

Utilization of knowledge in new learning situations requires a multifaceted process. Students may exposure to different activities to integrate new knowledge into the existing one that is clearly seen in the interviews as uttered *"It is important to keep in mind that not all procedures presented to students are intended to be learned to this level"*. Consequently, they should be exposed to several learning material, they may face obstacles in adopting such technique. Some of universities adopt knowledge management approaches without considering the objectives they wish to fulfill.

Objectives ae not Well-Defined

Defining objectives are driving motives to whole organizations. During the last few years some universities programs were not stating their KM objectives clearly. A successful knowledge management strategy will consider more than just technology, its people, process, technology, structure and culture, to determine and prioritize the knowledge management technology to understand the benefit of each type of technology. *"The professor should consider accuracy and speed in these practice sessions along with further shaping of the procedure ... students should be able to engage in the procedure independently"*. The knowledge management program is well underway if there is broad support and a need for enhanced computing and automation.

One of the difficulties that may face professors is that they need to develop a level of fluency based on the objectives. For example, a mathematics professor presents students with a procedure for using a protractor. However, the professor is aware that using a protractor is not a skill all students will require for success later on in school or in life. In such cases, it is appropriate to cease the formal instruction and the practice once students have a general sense of its execution. It should include a fairly wide array of exercises so as to expose students to different contexts in which

the procedure might be executed. Adding one a step over, professors should consider accuracy and speed. .

b) Opportunity of utilization of new knowledge in new learning situations:

Structured Opportunity

Few teachers invest the available opportunities to encourage students to develop knowledge for practicing and deepening understanding oriented toward skills, strategies, or processes. The identification of similarities: comparing, classifying, creating metaphors, and creating analogies, though, *comparing* is the process of identifying similarities and differences, *classifying* is the process of grouping things that are alike into categories based on their characteristics, *creating metaphors* is the process of identifying a general pattern that connects information, *creating analogies* is the process of identifying the relationship between two sets of items.

Learning environment is enhanced with structured opportunities to practice new knowledge. *Structured* means that the practice tasks are designed to maximize students' success rates, the professor asks students to share their new awareness regarding the strategy, *"students need to figure out what they know, what they do not know, and how to learn it. This requires students to: reflect on their prior knowledge and deepen it through reflection; transfer their previous learning to new contexts; master new concepts, principles, and skills; and be able to articulate how they developed this mastery"* This helps students shape the procedure to meet their individual needs. One can argue that during the shaping phase of learning a new procedure, students change, add, and delete elements.

Experience Selection

Professors may encourage learners to select suitable experiences posing problems, setting boundaries, supporting learners, providing suitable resource, ensuring physical and emotional safety, and facilitating the learning process, recognizing and encouraging spontaneous opportunities for learning, engaging with challenging situations, experimentation and discovery of solutions, *"periodically*

students are asked to review what they have recorded in their notebooks with an emphasis on identifying those things about which they were accurate initially and those things about which they were inaccurate initially".

Students may reexamine their understanding of content to keep their academic level, make new entries and to review what they have recorded to capture awareness and insights to give them opportunities to learn in authentic situations to deepen their knowledge through repeatedly acting and then reflecting on this action, to develop skills through practice and reflection, to support the construction of new understandings, and—to extend their learning as they bring their learning back to the classroom.

One can conclude that experiences provide opportunities for students to practice and deepen skills, encounter novel and unpredictable situations that support new learning, or learn from natural consequences, mistakes, and successes. Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning, and is challenged to take initiative, make decisions and be accountable for results.

To help students apply their knowledge and skills more broadly and appropriately, an effective first step is to find out what conceptual relationships they lack. For example, the professor can ask students to construct a concept map to support students in applying their knowledge and conceptual understanding to real-world problems

c) Practices of utilization of new knowledge in new learning situations

Authentic Experiences

One of the challenges facing educational programs is building up authentic experiences. One of the activities would facilitate such experiences is briefing the content and introducing related activities to facilitate understanding to link between the different components of the newly shared knowledge, e.g. two things do not seem related on the surface but are related at a more abstract level *"I usually identify the*

general knowledge or skill and explicitly discuss why it applies to the current situation. ... I can create multiple situations or problems that are very different on the surface but that all draw on the same knowledge". Other strategies are identifying general characteristics of the events to begin the activity in class and finish it as homework, and working in groups to review the homework to report on the insights gained from the activities and to examine the content in new ways.

Providing students with the opportunity to engage in authentic research experiences to make sense of what happen and note inconsistencies between the experience and their previous understanding. Moreover, developing new ideas or modify existing concepts to additional project-related concepts and to apply the new or refined knowledge in the learning environments.

Identifying Capabilities

Students figure out *what they know, what they do not know, and how to learn it* to reflect on prior knowledge and deepen it through reflection, transfer their previous learning to new contexts, master new concepts, principles, and skills, and be able to articulate how they developed this mastery through continuous engagement of learning cycle and deepening understanding of the scientific process. "... *ask students to construct a concept map in which they first identify all the concepts they associate with a given topic and then draw links between the concepts they consider to be related*". Deepening the tasks involving comparing, classifying, creating metaphors, creating analogies, and analyzing errors to clarify the thinking through providing the conditions for optimally supporting student.

Out-of-classroom community, students participate in an organized activity that meets identified objectives to better understand content and gain a broader appreciation of the discipline and an enhanced sense of civic responsibility. Appreciation of existing knowledge and skills to be effectively applied in multiple contexts to work through situations, analyzing their similarities practiced in different contexts.

Introduction of the practice session with a brief review of the procedure to give a sense of how it works, the practice exercise requires students to read the

sentences on their own, paying attention to the target words that require the strategy then to read the passage and try the strategy, volunteers are asked to describe how they used the strategy with the target words. In short, the practice session is structured so that a few well-crafted examples are addressed and discussed.

3. Does your organization have a strategy for capturing a new knowledge in new learning situations?

a) Difficulties facing organization's strategy for capturing a new knowledge:

Changing Educational Norms and Shared Values

Living in time with continuous changes, new values and norms need to be suitable for such time. Students need to identify and document the working problems that need resolution and the work contributors considering the purpose to fulfill best practices, also transform organizational structures to facilitate and encourage cross-discipline awareness and expertise and to establish and cultivate a knowledge-sharing, knowledge-driven culture arguing that *"We successfully implement a new knowledge management program that requires changes within our educational organization's norms and shared values; changes that some people might resist to quash"*.

Assessment Strategy

The strategy for capturing a new knowledge begins with assessing the current state of knowledge and significant personnel resources. To measure the actual effectiveness of the existing strategy and compare it to the previous to anticipated results, to establish some baseline measurements in order to capture the organization's performance prior to implement the knowledge management program.

The technological barriers protecting knowledge lead users to perceive that there is lack of knowledge, the knowledge segments should be identified. Knowledge management is about action, not just about collection and consolidation. Also, they need to identify external knowledge sources to help determine and understand current and future customers.

b) Opportunities enhancing organization's strategy for capturing a new knowledge

Minimize the Negative Impact

Envisioning and articulating the end state of learning cycle begin with establishing knowledge management objectives before selecting a tool, defining a process, and developing workflows. Strategy for capturing a new knowledge **is to** facilitate the effective management of the organization's knowledge assets progressively and to identify the ability of individuals within the organization to influence others with their knowledge. Secondly, determining and prioritizing the knowledge management technology needs to understand the benefit of each type of technology and broad support enhanced computing and automation.

Productivity and Consistency Strategy

Staff productivity and consistency by capitalizing on intellectual and knowledge-based assets enhance short-term wins to get support. As the community is approaching national plan 2020 for the transformation to the knowledge society, *creating a feedback mechanism* and *defining the building blocks* to indicate management how the system is used to structure of a viable knowledge management system, knowledge contribution and collection processes and capture knowledge in an appropriate format. A conducive culture to build more effective techniques for knowledge creation, transfer, and use to engage in high-level and general efforts to change the organizational norms and values related to knowledge via the identifications of the knowledge needed at successful educational organizational.

c) Practices of organization's strategy for capturing a new knowledge

Mobilizing knowledge

Well-developed plans need to be designed to lead the mobilization of knowledge to assist knowledge leaders. *Short-term* and *long-term* objectives that

address the work problems. Short-term objectives provide validation to the program progress, while long-term objectives will help to create and communicate the big picture. To increase the sharing of knowledge, the individual performance is recognized to allow knowledge strategy mobilizes and capitalizes creation, identification, classification, capture, validation, transfer, maintenance, archival, measurement, and reporting. Other practices are building a knowledge management implementation roadmap to provide some short-term wins in the first step of projects and metrics in the areas of performance, quality, compliance, and value.

Prioritize the Key Feature

Teachers and students need to prioritize and map out the knowledge that can be defined. The key features and identification of appropriate technologies can be positive orientation to encourage participants to create and use their knowledge and to establish best practices and governance for the efficient and accurate identification, management and dissemination of knowledge. Furthermore, they can improve the development of sophisticated scenarios for current and future competitive environments, ongoing successes to continued knowledge management investments.

4. What is the role of professor for creativity and innovation in education?

a) Difficulties facing professors for the adoption of creativity and innovation in education

Types of Knowledge

Teachers are not encouraged to introduce technical terminologies. Normally, what students gain from classes is not necessarily all content knowledge, they gain how you approach things. Tried-and-true activities that always are a part of their practice, *socio-cultural issues* of how certain topics inhabit the world around are also included in learning activities. The activities of applying new learned theories, sharing new values to report creativity as a focus, such as by asking everyone to contribute an

original idea from their own classroom to begin the dialogue or brainstorming ways are used to enhance creativity and innovation. Hence, creative inspiration arises in the individualized work. This is called the notion of intellectual risk taking in building a creative teaching practice which is tied to making frequent mistakes.

Creative Thinking Culture

Culture is an inspiring technique for creative thinking through collaborative activities prioritizes the importance of gathering ideas and bouncing them with other Professors. *"Two heads better than one"*: Usually, we can start brainstorming ideas and bounding them together. This activity is time consuming. To consider other people's perspectives how to learn something and what methods could make a topic interesting, teachers need to interview people from organizations in the community to figure out the meaning of some social concepts to draw on outside interests and creative ways of thinking to improve their professional practice.

b) Opportunities encouraging professors for the adoption of creativity and innovation in education

Novel Approaches

Breaking the ice is a daily needed strategy. Trying new ideas enables professors to find novel, interesting approaches to teaching and to find out which novel approaches work. They might create the kind of environment to make mistakes and know that making mistakes is part of work and our process and to manage ambiguity and to gain authentic experience that enhances creativity. New ideas through hobbies and creative passions may connect interests and school subjects. Moreover, collaborative efforts develop creativity *"It is argued that multiple brains focusing on one idea or one goal, the potential is exponential"*. Thus, mistakes are not seen negative, as a motive to come up with anything original make the chance to be

creativity. They are seen as motives to *build confidence* and *encourage curiosity* on students that creativity will enhance learning.

Creative Inspiration

Creativity is to be understood as the ability to make mistakes, to learn from them, it may arise in the course of individualized work through the discussion of the existing ideas asking questions to share lessons and ideas reflecting the beliefs on the importance of preparing students for labor market. This methodology would maintain open-minded awareness of interesting ideas, looking for innovative ideas for the classroom. Taking into consideration that innovative people are highly creative in areas outside their professional lives.

c) Practices of different mechanisms of professors for the adoption of creativity and innovation in education

Extended Learning Opportunity

Teacher are encourage to try new things which leads to good results on measuring achievement of objectives by collecting scientific data and sharing it with scientists. For example, algebra professor with an interest in sociology integrate sociology and came up with problems and applications of mathematics, also to teach science through an artistic lens or work sociology into math problems. Connections between the classroom and student's real lives. "*Create the desire to know*"; help to continue the thinking beyond lesson to find ways to extend learning opportunities outside the school environment. Professors share with colleagues via regular meetings to get together.

Investing Existing Ideas

The opportunity to talk through existing ideas and get new ones from others is an excellent creative catalyst. "*We build a collaborative creative community, at my department Professors begin to meet in my classroom once a month. Every professor*

brings a new idea, so that we could share ideas and try out things that had been successful in other classrooms". Professor highlighted the importance of gathering ideas and sharing them with other Professors. They use articles from daily newspapers to have a creativity material. Hence, creativity is a central force that shapes school culture. With the changing times, society is enriched by cultural-based creativity. Professors design cases in multidisciplinary lessons to include works of different topics and subjects to everyday concepts, they come up with ways to connect ideas and topics to events and contexts in the existing environment and to emphasize how these topics are inhabit the normal life via asking questions that go outside the lecture to engage the curriculum in new ways to create opportunities to solve a novel problem. Professors ownership of their successes continue the thinking beyond the lesson to extend learning opportunities.

5. How do like blended learning in your Educational Organizations?:

a) Difficulties of the existing situation of blended learning in Educational Organizations

Focusing Technology

The major difficulty in blending learning comes from some people focus on a specific technology. Professors need to consider factors to benefit from Tech classes; they need to recognize the nature of the course requirement, the needs of students, the technology available and delivery. They may adopt **flex model** relies heavily on online instructional delivery. One of the tangible outcomes is student's' writing abilities become more cohesive, they develop a variety of competencies not usually measured;

b) Opportunity of the existing situation of blended learning in Educational Organizations:

Encouraging Quick Developments

Professors recognize the chances to benefit from blended learning, they understand that blended learning is an open resource meeting the learning objectives

and promoting continuous learning approaches to create change and deep learning, providing opportunities for social learning, collaboration and to implement skills. It encourage faster development and learning materials reach different locations at different times at the connivance of the learners, also providing ways to build community to make interaction and engagement of the blended approaches.

Regarding much of the criticism concerning face-to-face model at various levels, students are digitally-oriented, understand the potential for success that blended learning may offer them, and are excited about the opportunities that blended learning offers them. The impact of internet is to have access to more content and material for use in classrooms, digital tools enhance reading comprehension and vocabulary development providing: word pronunciation, word meaning, contextual information, and comprehension.

Autonomous Learning

Becoming independent learners and self-starters, to work collaboratively, and developed a positive orientation to their future. Technology uses in the classroom help to decrease absenteeism, lower dropout rates, and motivate more students to continue on to college. Professors use technology for professional development and enhancing efficiency, authenticity and comprehensibility of learning materials and be hyperlinked to different media.

C) Practices of the existing situation of blended learning in Educational Organizations:

Making New Connections Between Different Disciplines

Professors acknowledge provision of orientation and rationale for using blended learning at an organizational level to be understood by the senior members of the management and to link the learning experiences to each other to reinforce them to meet the learning objectives. Different techniques assist in evaluating blended programs to be sure which aspects are motivating and which are frustrating. Meanwhile, they state that the new learning environments increase connectivity to stream videos and share informal learning experiences via internal and external social

media and informal learning is pushed forward by the rise of mobile devices in the workplace. Combination of face-to-face instruction and online learning opportunities allows for individualization, flexibility, and greater chance for student success.

Creating More Interactions

The advantage of sharing ideas with other professors enable interaction with parents, demonstrate positive effects of technology on both learning in a content area and learning to use technology. Of course, technology is effective in teaching basic skills, improve scores on achievement tests, provide the means for students with special needs to communicate via e-mail and can help professors accommodate students' varying learning styles.

Professor argue that different researches demonstrate that students who learn in existing multimedia and/or hypertext environments show greater gains in areas of language development than students who learn in more traditional environments. Learners become accustomed to learning being an integral part of all aspects of their lives, which establishes ongoing learning habits lasting long after graduation.

3. Results of the Research

3.1. Acquiring Knowledge in the Education Environment

The Acquiring of knowledge in the learning environment section includes 25 items in which all items were received a positive answer of the population of the study. The calculated means of these items were ranging between (2.41- 2.71). Such means are allocated in the third category of the triple scale gradient categories ranging from (2.34- 3.0). Hence, the result indicates that the convergence of the point of views of the population of the research towards the Acquiring of knowledge management processes in the learning environment.

The general average mean (2.55) and this indicates that there is a consent among the population of the research on the Acquiring of knowledge management in the learning environment section, and it is (that workers in knowledge management know that the primary goal of knowledge management is to take advantage of knowledge for the benefit of the work as well as that knowledge workers

determine the available information in addition to the knowledge cycle system developed in which everyone can find the information easily and be aware of the new information regardless of the extent of their contribution to work, they also help students in achieving the goal of development).

3.2. Producing Knowledge in Learning Environment

The production of knowledge in the learning environment section includes 20 items in which 19 items were received a positive answer of the population of the research. The calculated means of these items were ranging between (2.48- 2.77). Such means are allocated in the third category of the triple scale gradient categories ranging from (2.34- 3.0), while one item got the (I do not know). The calculated means of these items were ranging between (1.67 to 2.33). Hence, the result indicates that the convergence of the point of views of the population of the study towards producing knowledge management processes in the learning environment.

The general average mean (2.58) and this indicates that there is a consent among the population of the research on the production of knowledge management in the learning environment section, and it is (that knowledge workers use the appropriate means to acquire the necessary knowledge, as well as that the knowledge workers in the learning environment rely on the acquisition of knowledge through modern technology in addition to that they use clear techniques to acquire modern knowledge and encourage their students to produce knowledge using various resources such as books, internet, newspapers and other media and means of social media, as well as that the knowledge workers do their work by working in teams to produce knowledge).

3.3. Storing Knowledge in Learning Environment

The storing of knowledge in the learning environment section includes 13 items in which all items were received a positive answer of the population of the study. The calculated means of these items were ranging between (2.43- 2.60). Such means are allocated in the third category of the triple scale gradient categories ranging from (2.34- 3.0). Hence, the result indicates that the convergence of the point of

views of the population of the study towards storing of knowledge in the learning environment.

The general average mean (2.52) and this indicates that there is a consent among the population of the research on the production of knowledge management in the learning environment section, and it is (that information and communication technology that help knowledge workers in managing knowledge to sort and classify new information as well as it is saved knowledge containers declared (such as books, magazines) using the global classification systems (manual system of classification) to facilitate handling the information quickly and encouraging knowledge workers to select the new lessons of best practices to make them accessible to others to be accessible in future as well as to be implemented in the learning environment.

3.4. Sharing Knowledge in Learning Environment

The sharing of knowledge in the learning environment section includes 13 items in which all items were received a positive answer of the population of the study. The calculated means of these items were ranging between (2.36- 2.76). Such means are allocated in the third category of the triple scale gradient categories ranging from (2.34- 3.0). Hence, the result indicates that the convergence of the point of views of the population of the research towards sharing of knowledge in the learning environment.

The general average mean (2.54) and this indicates that there is a consent among the population of the research on the of knowledge management processes in the learning environment sharing section, and it is (knowledge sharing can achieved in the educational environment strategy through clear mechanisms for the sharing of knowledge as well as the can achieve knowledge workers realize that there is much of knowledge to be learned to build the technical and professional expertise. knowledge workers identify the quality new knowledge gained and encourage to exchange ideas and experiences with other colleagues and can involve in activities and events organized by the school, such as training, lectures and communications, as well as the knowledge workers discuss with their friends and colleagues new educational experiences) to facilitate handling the information quickly and encouraging knowledge workers to select the new lessons from best practices to make them

accessible to others to be accessible in future as well as to be implemented in the learning environment.

3.5. Disseminating Knowledge in Learning Environment

The dissemination of knowledge in the learning environment section that includes 17 items in which all items were received a positive answer of the population of the research. The calculated means of these items were ranging between (2.45-2.61). Such means are allocated in the third category of the triple scale gradient categories ranging from (2.34- 3.0). Hence, the result indicates that the convergence of the point of views of the population of the research towards dissemination of knowledge in the learning environment.

The general average mean (2.55) and this indicates that there is a consent among the population of the study on the of knowledge management processes in the learning environment sharing section, and it is sharing knowledge can devise new solutions and implement available knowledge to improve the environment of work. They take full advantage of the knowledge gained to assist in the achievement of learning objectives. Knowledge workers use clear strategies to capitalize the best use of their knowledge as well as are encouraged to invest the available knowledge in addition to identify the appropriate knowledge based on experience.

3.6. KM Processes Apply Theoretical Principles of Knowledge Management

The aforementioned responses exhibit that KM processes which apply theoretical principles of knowledge management processes, as follows:

Table (17)

KM Processes Apply Theoretical Principles of Knowledge Management

No	KM Processes	Mean	Standard Deviation	Order
1	Acquiring of knowledge in the learning	2.55	.40	2

	environment			
2	Producing of knowledge in the learning environment	2.58	.42	1
3	Storing of knowledge in the learning environment	2.52	.46	5
4	Sharing of knowledge in the learning environment	2.54	.42	4
5	Disseminating of knowledge in the learning environment	2.55	.47	3

The production knowledge in the learning environment came the first process that apply the theoretical principles of the knowledge management processes with an overall average (2.58), followed by the Acquiring of knowledge in the learning environment with an overall average (2.55), and the third process is the dissemination of knowledge management in the learning environment with an overall average (2.55), while the sharing of knowledge management in the learning environment operations ranked to be the fourth within the overall average (2.54), and the storage of knowledge in the learning environment as the less processes used that apply theoretical principles of knowledge management processes with an overall average (2.52).

4. The Research Hypotheses

- **The first hypothesis:** There is a statistically significant in the relationship between the staff developmental characteristics of the population of the research and the adoption of KM principles in performing the duties of sharing creating and utilizing knowledge to enhance learning environment to become a learning organization. The validity of the previous assumption is checked by Pearson correlation coefficient (Pearson Correlation) and it is also clear from the table (18).

Table (18)

Results of Pearson correlation coefficient between the staff developmental

**characteristics of the population of the research and the degree of the adoption
of KM principles in performing the duties of sharing creating and utilizing
knowledge**

	Education
Pearson Correlation	0.880
Sig. (2-tailed)	.001
N	143

Table No. (18) illustrates that there is a statistically significant correlation at the level of (0.01) between the staff developmental characteristics of the population of the research and the adoption of KM principles in performing the duties of sharing and creating knowledge to enhance learning environment to become a learning organization., as the value of the Pearson correlation coefficient (0.880). According to the previous result, the staff developmental characteristics of knowledge workers increase the degree of adoption of knowledge management strategies in the educational organizations to be more attractive and facilitating learning.

- **The second hypothesis:** There is a statistically significant relationship between the utilization of *Information Communication Technology* strategies systematically, and the conversion of the educational organization to become a professional knowledge creation organization. The validity of the previous assumption is checked by Pearson correlation coefficient (Pearson Correlation) and it is also clear from the table (19).

Table (19)

**Results of Pearson correlation coefficient between the utilization of ICT by
knowledge workers and the conversion of the educational organization to
become a professional knowledge creation organization**

	Education
Pearson Correlation	0.867
Sig. (2-tailed)	.001
N	143

Table No. (19) illustrates that there is a statistically significant correlation since the correlation is at the level (0.867) which higher than (0.001) between the utilization of ICT systematically, and the conversion of the educational organization to become a professional knowledge creation organization, as the value of the Pearson correlation coefficient (0.867). According to the previous result that the utilization of *Information Communication Technology* strategies systematically assist in converting the educational organization to become a professional knowledge creation organization.

- **The third hypothesis:** There is a statistical significant difference between integration of KM strategies with administrative program to make the learning environments more intelligent. To test the validity of the previous hypothesis the researcher used Pearson correlation coefficient (Pearson Correlation) and it is also clear from the table (20)

Table (20)

Results of Pearson correlation coefficient between the integration of KM strategies with administrative program to make the learning environments more intelligent

	Education
Pearson Correlation	0.658
Sig. (2-tailed)	.001
N	143

Table (20) illustrates that there is statistical significance of correlations at the level of (0.01) between the integration of KM strategies with administrative program, as the value of (0.658) Pearson coefficient. The previous result indicates that the integration of KM strategies with administrative program makes the learning environments more intelligent.

- **The fourth hypothesis:** There is no statistical significant difference between years of experience in implementing KM approaches making their educational organizations learning organizations. To test the validity of the previous hypothesis the researcher used Pearson correlation coefficient (Pearson Correlation) and it is also clear from the table (21)

Table (21)

Results of Pearson correlation coefficient between the years of experience in implementing KM approaches making their educational organizations learning organizations

	Education
Pearson Correlation	-0.172
Sig. (2-tailed)	.041
N	143

Table (21) illustrates that there is an inverse relationship with weak statistical significance of correlations at the level of (0.05) between years of

experience in implementing KM approaches making their educational organizations learning organizations, as the value of (0.172) Pearson coefficient. The previous result indicates that the new knowledge workers are more inclined to make their educational organizations learning organizations.

5. Conclusions

The researcher came across different KM approaches and analyzed the implementation of KM in educational organizations, public schools and universities, he came up with some conclusions as follows:

- 1) There is a significant problem that can be addressed by transferring a knowledge hoarding culture to a knowledge sharing culture. The potential benefit to every individual in the organization is substantial. These are problems that can be solved with a steady, authentic approach to modification of the behaviors and climate, and simple inexpensive resolution of the technical needs;
- 2) The most effective way to create a knowledge sharing culture – is first to start to practice it at individual level. The higher up the organization the more effective you will be in changing the culture. Second, put in place the knowledge sharing technology and train and educate people in its effective use. The two together – people with the appropriate knowledge sharing mindset and the appropriate knowledge sharing technology to support them will rapidly bring about a knowledge sharing culture that helps you better meet your business objectives;
- 3) New knowledge in new learning situations can be utilized via different activities assignments and can be demonstrated an overall positive effect of homework on student achievement;
- 4) Teachers should distinguish between declarative and procedural knowledge. Practice is more appropriate for procedural knowledge. Activities such as identifying similarities and differences and error analysis are more appropriate for declarative knowledge. Use of cooperative groups, homework, and revision activities apply well to both types of knowledge;

- 5) Developing a knowledge management strategy provides a unique opportunity to gain a greater understanding of the way the organization operates, and the challenges that confront it;
- 6) By focusing on identifying staff needs and issues, activities and initiatives can be recommended with the confidence that these will have a clear and measurable impact upon the organization;
- 7) Supplementing this 'bottom-up' research with a strategic focus then ensures that the KM initiative is aligned with broader organizational directions;
- 8) A strategy for capturing a new knowledge in knowledge-based economy realized the need and importance of valuable asset. Since knowledge management caters to the critical issues of organizational adaptation, survival and competence in face of increasingly environmental change, therefore there is an essential need of managing it effectively;
- 9) There are three components that can play effective role in managing valuable asset effectively include: (i) defining effective strategies for its management, (ii) using state of art information technologies for implementing these strategies and (iii) developing knowledge management systems and a strong culture that can recognize its need and importance and thus adapt it;
- 10) Since knowledge is a prerequisite of learning, therefore effective knowledge management can result in improvement in capabilities and business activities of a learning organization which as a result can add value to its services or products, thus improving its overall performance and giving a competitive edge to it;
- 11) To evaluate the role of blended learning in education that integrating technology-enhanced teaching with traditional approaches have potential to improve competencies among students;
- 12) The survey shows that blended learning has not been comprehensively embedded in higher education. According to most of the respondents, blended learning has not yet been integrated as a program of study. Traditional classroom teaching is still dominating and is mostly complemented by e-learning forms to administrate and support the predominantly classroom-based learning forms;

- 13) Blended learning does not lead to significant cost and time reductions for universities and teachers. The low level of embeddedness of blended learning in higher education is reflected in the IT infrastructures that support blended learning;
- 14) The main performance driver for blended learning in higher education is the level of embeddedness. The higher this level is, the better the potential of blended learning can be utilized;
- 15) Blended learning is used as an integrated program of study bear the highest performance potential with respect to the effectiveness of teaching and learning;
- 16) Certain infrastructure aspects are important as enablers of blended learning since they are positively correlated with embeddedness, especially the cultural fit between blended learning and the educational philosophy which plays an important role for the integration of blended learning while hard factors are considered less vital by most of the participants. Thus, university
- 17) Educational management has to accomplish an overall cultural change when to fully integrate blended learning into university teaching.

6. The Future of KM in educational organizations

Educational organizations have several characteristics that provide advantages in the area of KM. For example, KM processes operate on a smaller scale and are able to have more intimate interactions among people. Knowledge created through the mechanism of these communication interactions could produce knowledge to improve the quality of learning and success of the learners. Establishing KM processes could improve the possibility of solving the learning's difficulties increase (Dalkir, 2011)

KM contributes differently to educational organizations depending upon the nature of that organization. KM is not only a technology or a set of methodologies, but also it is a practice or discipline that involves people, processes and technology. KM improves the productivity and efficiency of an entire organization. Furthermore, KM practices can be utilized as a knowledge base, knowledge sharing, collaboration

and knowledge reuse to efficiently enhancing and supporting education. For example, KM in the field of education can reduce the training time and speed new teachers ramp up. It enables them to become more confident and competent. By having access to knowledge, new teachers can get answers to common questions without having to constantly ask other more experienced ones. End-users also benefit when they have direct access to knowledge to solve their own issues without ever contacting an educational advisor. A growing number of people now prefer self-service to solve daily problem and concern rather than consulting experienced colleague (Botha et al 2008).

KM process is composed of six phases: identify, create, store, share and use to achieve organizational goals, and establish an environment conducive to knowledge sharing. KM process consists of knowledge generation, knowledge representation, knowledge codification, and knowledge application. Today, a large number of organizations are putting much emphasis on the utilization of KM processes. KM main objective is to manage the most essential knowledge to the development the organization. Consequently, KM can assist knowledge users in enhancing and expanding the innovation process (Hislop, 2013).

The models presented in this research lay bases of the theoretical foundations of the suggested KM model for educational organizations. These theoretical principles explain, describe and predict the best practices to manage KM. The researcher selected three KM models as to build a model for educational organizations. First, the spiral model is an approach which deals with knowledge creation and management of innovation. The all forms of knowledge (tacit/explicit) and three tier of knowledge sharing (individual/group/the organizational) both are needed to create knowledge and innovation. This model It deals with a well-defined knowledge creation process. Knowledge creation process starts with individuals. Then the individual's private knowledge is transmitted into valuable and public organizational knowledge. The core principle of this KM model is to make the personal knowledge available to everyone in the organization. The engine of the knowledge creation is a four step knowledge conversion process between tacit and explicit knowledge - tacit to tacit (socialization), tacit to

explicit (externalization), explicit to explicit (combination) and explicit to tacit (internalization).

In the spiral model, the knowledge creation depends on continuous and dynamic interaction between tacit and explicit knowledge throughout all quadrants. The organizations develop tools and models to gather and share knowledge. The knowledge spiral is a continuous activity of flow, sharing and conversion of knowledge by individuals, group and the organizations. The primary conditions for knowledge creation are intention, autonomy, creative chaos, redundancy requisite variety.

Second, the Wiig KM model explains that knowledge can be useful when it is organized. Knowledge is organized and stored in the form of semantic networks. Wiig's model suggest these dimensions: completeness, connectedness, congruency, perspective and purpose. Completeness answers the questions that how much useful information is available from a given source such as human minds or knowledge bases. Connectedness defines relationship between different knowledge objects. Congruency explains that all the facts, values, judgments, association and relationship between knowledge objects are consistent. Perspectives and purpose describes the knowledge and view of specific purpose.

The Wiig KM model depicts the process that defines the strategy for management to build, divest and enhance knowledge assets. The strengths of this model exist on its strategic focus, which essentially puts knowledge management action into context. KM initiatives are the result of the response to tactical and strategic changes and needs. It provides a great overview of the strategy behind KM. It offers a realistic overview of the KM process and includes the creation of new knowledge as a specific KM initiative.

Third, KM cycle explains the way knowledge is managed, in the form of explicit knowledge. The different phases of KM cycles are creation, organization and storage, sharing, access and usage. New knowledge is created or existing knowledge is gathered. A knowledge audit is a good technique for discovering what exists. Organization and storage of knowledge is classified and stored, perhaps using a company specific taxonomy. Sharing of knowledge may be pushed to people as part of routine dissemination. Access of

knowledge is the fourth step of knowledge cycle. Individuals browse or search the organization's information and document repositories, typically via an intranet. Use of knowledge is the fifth step of knowledge cycle. They use this knowledge to carry out specific tasks. As they use it the knowledge is evaluated, refined and improved. As a result new knowledge is created and the cycle repeats.

7. KM Model in Educational Organizations

Educational organizations embrace vast amounts of explicit and tacit knowledge in areas that are critical to achieve their goals, such as knowledge related to product development and process integration (Rus and Lindvall, 2002; Shankar et al., 2003). Managing this knowledge effectively promises to allow educational organizations to save time and money, improve quality and performance, and provide a competitive advantage. Therefore, organizations need to successfully implement KM to capitalize on their knowledge and achieve those benefits.

Lawton (2001) suggests that implementing KM involves a number of challenges and obstacles. Three issues are particularly important:

1. **Technological issues:** Software programmes support KM, but they are not always possible to integrate all different subsystems and tools to achieve the planned level of sharing. Information security requirement is not fully provided by the existing programmes.
2. **Organizational issues:** Both technology and methodology are essential for the implementation of KM. Unfortunately most organizations focus only on technology and neglect methodology. This exercise may lead to devote all resources to technology development without planning for KM implementation.
3. **Individual issues:** Some cultural behaviour may prevent knowledge sharing. For instance, some educators do not share their knowledge with others or they do not ask about new information or they do not want to reuse someone else's knowledge.

7.1. Requirements of the KM Model

The needed KM model should consider all relating issues and introduce a framework that provides educational organizations with detailed requirements for successful KM implementation. These requirements can be summarized as follows:

1. Classification of the different types of knowledge available in educational organizations according to their knowledge processing requirements (i.e. knowledge acquisition, development, and distribution). Different types of knowledge need to be handled differently. For example, the requirements needed to acquire explicit knowledge are different from that needed to acquire tacit knowledge;
2. Identification of the steps in the knowledge management life-cycle within educational organizations and how they accommodate the different types of educational knowledge;
3. Outlining the importance of deploying a KM strategy in the organization and describing the characteristics of such a strategy;
4. Describing how the organization's KM strategy can be transferred to the operational level;
5. Identifying the knowledge infrastructure that is essential for effective implementation of KM. Such an infrastructure should consist of culture, people, technology, and structure that facilitate the knowledge cycle architecture of identification, acquisition, development, and distribution;
6. Describing how the elements of the knowledge infrastructure facilitate the educational knowledge life-cycle and specify interrelationships.
7. Providing educational organizations with a framework that identifies the requirements which are necessary to facilitate their knowledge needs. Organizations can then assess their KM status and determine the areas of weaknesses "gaps". The route of progress then becomes visible as organizations can focus on improving their weaknesses.

7.2. The KM model will consisting of three processes

1. The first process is that educators need to classify educational knowledge according to their knowledge processing requirements and places them in three categories (electronic library or respiratory which contains an organization's explicit knowledge that is easily codified; documented procedures and lessons

learned which represent tacit knowledge that has been transferred into explicit knowledge; and experience and know-how which refers to tacit knowledge that educators gain through their work experiences and is not easily codified).

2. The second process requires educators to manage the elements of the classification of educational knowledge. This process constitutes the KM life-cycle composed of: knowledge identification; knowledge acquisition and development knowledge distribution; and knowledge measurement and review.
3. The third requires educators to manage the facilitators and infrastructure that support the elements of the KM life-cycle. These are: strategy; technology; and organizational structure.

8. Recommendations

The researcher recommends the following as to improve the implementation of KM in educational organizations specially to make such organizations learning organizations, as follows:

1. Knowledge identification is an essential process that deals with discovering the knowledge that an organization possesses. Once knowledge is created, it should be shared and reused. All cultural or structural constraints should be removed. Taking into consideration that explicit knowledge is discovered from documents, processes, and other data repositories. Knowledge workers need to use sophisticated IT tools to find hidden knowledge. Tacit knowledge, on the other hand, should be identified by experts through certain methods such as interviews, discussion forum, questionnaire, observations.
2. Knowledge Organization is done through the identifications of strengths and weaknesses of knowledge. It is organized in some valuable format which can easily be managed by adopting different techniques such as classification, mapping, indexing and categorizing knowledge for navigation, storage and retrieval. The explicit knowledge is organized and retrieved by using taxonomies, ontologies creating logical and hierarchical knowledge maps. While the tacit knowledge can be organized by expert forums, social network groups and knowledge coordinators. Knowledge workers need to

participate actively in educational organization since most of tacit knowledge unused.

3. The management of core competencies follows four step process: identifying, sustaining, building, and unlearning. KM plays an important role in this process by identifying the knowledge and expertise of the organization, leveraging knowledge assets across the organization, building the right logic and expertise to match strategic requirements and removing or changing the obsolete knowledge.
4. Knowledge Creation should be considered as the main duty committed by knowledge workers through adopting better practices, collaboration, interaction and education between individuals. Emphasizing that the relevant information plays a role of building blocks in creation of new knowledge. Knowledge leadership can play a major role in knowledge creation by enabling and encouraging knowledge sharing, creating a suitable work atmosphere, providing infrastructure which supports the work process and making information and data available to knowledge-workers on time. Furthermore, knowledge can be created by converting tacit into explicit and then documenting it. IT plays an important role in transfer of all knowledge types into explicit knowledge. IT provides both formal and informal collaboration for knowledge.
5. The management of external network incudes handling of external knowledge sources such as customers, suppliers, competitors, partners etc. KM plays a role in the assessment of important partners, by helping to determine what the organization knows, what is its needs, and the best ways of getting that knowledge. Management of external knowledge sources ensures that whether the right knowledge has been transferred and integrated into the organization or not. The general steps for management of external networks are: identification of potential target network, evaluation of target, establishing the relationship with target and knowledge integration. The management of external network are providing all relevant information related to internal knowledge assets, helping in evaluation process and encouraging knowledge integration and sharing.

6. As mentioned above, knowledge sharing is the most important KM process because a vast majority of KM initiatives depend upon sharing them. Knowledge sharing mechanism can be either push or pull. The pull knowledge relates to the situation when the knowledge worker actively seeks out knowledge sources (e.g. library search, seeking out help from an expert, collaborating with a coworker, etc.), while knowledge push occurs when knowledge is "pushed onto" the user (e.g. newsletters, unsolicited publications). Knowledge sharing depends on the culture and interests of the organization. Successful knowledge sharing can be determined by articulation, awareness of the knowledge available, access to the knowledge, guidance and completeness. For successful knowledge creation, knowledge workers have to define the areas of expertise of the members, provide guidelines to the contributions and help users. IT can play an important role in sharing both explicit and tacit knowledge. It uses content management, document management, data mining and text mining tools for sharing explicit knowledge. IT can use expert finder tool to share tacit knowledge. It can also externalize tacit knowledge by using tools such as forums, chat rooms.
7. Moreover, the knowledge sharing strategies make the right information available to right people. The sharing of knowledge needs proper strategy for knowledge management, correct KM models, proper KM cycle for knowledge creation to sharing and a robust and efficient architecture to build IT portals who can handle this process.
8. Knowledge utilization is similar to created or used knowledge in different environments. There are three primary actors involved in knowledge reuse. These are producers, intermediaries and consumers. Knowledge can be reused internally or externally by common work producers or by Shared work practitioners and Expertise-seeker.
9. Knowledge workers need to use different strategies to manage the organizations' knowledge through involving management of the organizational structures, management of knowledge retention, management

of core competencies, management of external network, and management of KMSs.

10. The management of KMSs is helpful in sharing, discovering, and creating knowledge. Failures are generally happen due to over reliance on technology, a lack of understanding of the limitations of these systems, improper fit with the organizational practices or lack of acceptance of these systems. The proper implementation of KM needs attention paid to the organizational fit, the organizational acceptance.
11. KM uses technologies from knowledge-based system design such as strategies related to structured knowledge acquisition from experts and educational technologies. These technologies are enabled by knowledge management systems.
12. The management of knowledge retention is concerned with making sure that important knowledge assets remain in the organization over time although key educators leave the organization. Formulation of a knowledge retention strategy depends upon understanding which knowledge is important. For knowledge retention, an organization may choose to implement one of many initiatives and tools, such as reward structures, mentoring, interviews, and utilizing knowledge from retirees.

9. Practical Implications

To remain sustainable and competitive in dynamic environments of today, educational organizations are required to acquire strong dynamic capabilities by implementing a variety of KM activities. Therefore, the most important concern of senior management must be how to develop and effectively exploit such capabilities to improve the organization's institutionalized competitiveness. This study attempts to provide a variety of practical recommendations for guiding business executives to be successful in using KM projects to attain strategic objectives.

Firstly, the research suggests that practicing knowledge workers should understand and develop a holistic approach of implementing an overall KM capability which is composed of the three perspectives of social, technical infrastructure and processes. These correlated and complementary capabilities should not be considered in isolation but rather should be integrated and combined to leverage, exploit and sustain.

Secondly, management should, on the one hand, coordinate and synchronize infrastructure capabilities from both social and technical aspects to facilitate KM process capability. On the other hand, they need to keep in mind that cultural attributes are of the most importance to social infrastructure capability and also exert the most influence on other capabilities.

Management of the organizational structures includes management of project teams, teamwork and other social functions. The organizational structures are of two types: formal and informal. The formal structure can interfere with KM if enforced. The choice of structure and the physical division of the organization is significant because it will affect knowledge flows. In practice, decentralized structures are more beneficial for KM.

Practicing knowledge workers also need to take advantage of technological capability to support KM processes. In particular, educational organizations should use technology to map the location of specific types of knowledge, thereby facilitating the application and sharing of knowledge. Technology also needs to be applied to facilitate people in multiple locations to learn as a group from a single or multiple resources and at a single or multiple points in time. By doing so, social and technical infrastructure elements can complement each other and come together to enhance knowledge-oriented processes.

In addition, to consider and develop infrastructure capabilities as positive enablers of process capability, the study further suggests that practicing managers must place more effort into pursuing various KM processes. The four related processes of knowledge acquisition, conversion, application, and protection, on the one hand, should be integrated and coordinated to leverage KM infrastructure. On the other hand, educational leaders should be aware of the more critical role of the capacity to effectively apply integrated knowledge

resources to the creation and delivery knowledge to learners, assisting the learning environments to improve their efficiency and to implement 21st century skills.

While the organization's vital strategic objectives is its performance, senior educational leaders should understand that infrastructure capabilities *per se* do not directly improve these outcomes, especially in the presence of process capability. However, infrastructure elements can, through KM processes, provide a fully mediated support. Therefore, management should start with the development of infrastructure capabilities from both social and technical perspectives, which in turn will provide the platform necessary for increasing the effectiveness and efficiency of process capability, the key driver in improving organizational competitiveness.

As mentioned above, among infrastructure capabilities, more attention should be paid to social aspects, especially cultural issues because they have a considerably stronger influence on knowledge processes than the technical aspects do. Similarly, while combining all knowledge processes, more effort needs to be placed on applying and utilizing knowledge-based resources. Although being aware of the relative importance of each factor is necessary to establish prioritization in implementing KM projects and activities, practicing leaders should understand that an over emphasis on any factor, especially those of less importance as well as a complete neglect of any factor, especially those of major influence can lead to inefficiency and other negative consequences.

10. Future Research

- 1- Future research could investigate each of the individual knowledge capabilities included in the model by combining both quantitative and qualitative research methods to develop a deeper insight into each factor and provide richer and more accurate data in a specific context.
- 2- It is advisable to use more than three indicators to measure constructs. Therefore, the shortened scale of the measures due to the CFA model re-specification requires cross-validation studies to re-evaluate the measurement

model and examine its generalizability. Cross-validation studies might be conducted in similar or different cultures.

- 3- It would be appropriate if the model was further explored to determine if there is an optimal level of capabilities so that management can employ available resources and an optimal combination of different factors to develop a proactive approach for designing long-term strategies.
- 4- This finding needs more testing in similar or different contexts to reconfirm the empirical result and the theory of a dynamic capability-based approach, especially in emerging, less developed countries.
- 5- Other factors constituting social KM infrastructure capability can also be included in the model, such as business strategy and leadership to examine the relative importance of each factor as well as their impacts on the organizational.
- 6- It is clear that culture is a determinant of both external and internal learning environments which influences entrepreneurial activities in general and the success of KM projects in particular. Therefore, future research might investigate further external environments with a focus on cultural properties to explain why and how they can assist to enhance KM processes, innovation and competitiveness.

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Annexes

Annex I

Knowledge Management (KM) processes for the Transformation to the Knowledge Society: A modal for Enhancing and Supporting Education

Questionnaire

Part I

Personal data

1. Name (optional)
2. Nationality Saudi () Non-Saudi ()
- 3.
4. Qualification
 - a. B.A.
 - b. M.A.
 - c. Ph.D.
 - d. Other
5. Capacity Building Program/ Training

Dear Participants:

First, the researcher is very grateful for your time and efforts you spend to participate in response to the questionnaire as a research instrument about Knowledge

Management (KM) processes for the Transformation to the Knowledge Society: A modal for Enhancing and Supporting Education.

The basic knowledge processes that are part of the KM framework i.e. identify, create, store, share and use knowledge. The instrument items are asked in relation to the organization as a whole, i.e. not focusing on the knowledge aspects in isolation, so that one is able to see whether the knowledge aspects of the organization are relatively strong or weak points. Finally, for each knowledge process, the respondent is asked about his/her personal attitude and actual behavior related to the knowledge processes.

I. Knowledge Management (KM) Processes for Framing Community of Practices (Cops)

No.	Statement	Disagree	Neutral	Agree
1	Knowledge workers know what information they need to achieve their duties/goals.	17.5	18.2	64.3
2	If knowledge workers are asked “what are the most important information needed?”, they would always give the same answer.	14.7	29.4	55.9
3	Knowledge workers look for existing information in order to avoid repeating the previous efforts.	13.3	18.2	68.5
4	Knowledge workers know from each other who knows what.	14.0	27.3	58.7
5	Knowledge workers identify the available information.	6.3	22.4	71.3
6	The structure of our community of practices reflects the knowledge cycle.	7.7	28.7	63.6
7	We have a sophisticated knowledge cycle system in which everyone can easily find the existed information.	4.9	25.2	69.9

8	Knowledge workers often question which information needed to do current and future tasks.	11.2	25.2	63.6
9	Knowledge workers know what new knowlwdge they acquire.	8.4	23.8	67.8
10	Knowledge workers recognize that the basic aim of knowledge management is to leverage knowledge to the organization's advantage.	7.7	14.0	78.3
11	Knowledge workers recognize that the tacit knowledge is difficult to articulate/ to put in words.	14.0	30.8	55.2
12	Knowledge workers recognize that the explicit knowledge is represented in content that has been captured in tangible form such as books, articles etc.	11.2	19.6	69.2
13	New information is more attractive to be learned regardless of its contribution to the organization.	11.9	14.0	74.1
14	Knowledge workers believe that both types of knowledge (tacit and explicit) are significant to the future development.	12.6	25.9	61.5
15	Knowledge workers encourage students to improve their performance by learning new knowledge.	10.5	17.5	72.0
16	Knowledge workers assist students to achieve their development goal.	9.8	18.2	72.0
17	Knowledge workers encourage students to identify their interests or deficiencies.	9.8	20.3	69.9
18	Knowledge workers encourage students to evaluate their recent learning experience.	14.0	23.8	62.2
19	Knowledge workers know current and future responsibilities for their career development.	11.2	24.5	64.3
20	Knowledge workers know what kind of knowledge is helpful to work and life.	7.7	23.8	68.5
21	Knowledge workers know whether the acquired learning information or materials are what needed and their practical effects in learning.	9.8	25.9	64.3
22	Knowledge workers can compare the acquired knowledge and determine their familiarities to the learning situation.	9.8	25.9	64.3

23	Knowledge workers can assess learning outcomes and figure out what still needed to learn.	11.2	32.9	55.9
24	Knowledge workers assess whether they have achieved the expectation.	9.1	28.0	62.9
25	Knowledge workers know the efficiency of acquired knowledge.	12.6	23.8	63.6

II. Knowledge Management (KM) Processes for knowledge Creation in Community of Practices (Cops)

No.	Statement	Disagree	Neutral	Agree
1	Knowledge workers adopt explicit strategies for knowledge development e.g. (R& D).	9.8	21.7	68.5
2	Knowledge workers use clear techniques for acquiring new knowledge.	6.3	19.6	74.1
3	Knowledge workers develop networks to create knowledge.	11.2	29.4	59.4
4	Knowledge workers focus on learning and exploring new ways of creating new knowledge.	9.8	32.9	57.3
5	Knowledge workers adapt innovative processes to create knowledge.	11.2	26.6	62.2
6	Knowledge workers develop ways to support the creation of new knowledge (e.g. via training programs, duty rotation).	8.4	25.2	66.4
7	Knowledge workers use the right techniques to capture new ideas and experiences.	11.2	26.6	62.2
8	The culture of exploring new ideas has become a predominant culture so "our students can create new knowledge".	23.8	23.1	53.1
9	Knowledge workers should effectively create new knowledge when needed using available resources.	11.2	19.6	69.2

10	Knowledge workers are useful to any community of practice.	7.0	23.1	69.9
11	Newly content created is appreciated by everyone in our community of practice.	10.5	21.0	68.5
12	Knowledge workers arrange learning tasks based on mandatory duties.	11.2	26.6	62.2
13	Once, a duty is mandated knowledge workers try to get the required knowledge to succeed.	9.8	20.3	69.9
14	Knowledge workers adapt new methods and techniques adjusted to new learning situations.	9.8	22.4	67.8
15	Knowledge workers consciously finish learning tasks accordingly with established plan.	12.6	23.1	64.3
16	Knowledge workers' plan includes: (i) the kind of learning activities; (ii) the type of acquired knowledge and (iii) the time needed for completing the task.	9.1	15.4	75.5
17	Knowledge workers use suitable means to acquire necessary knowledge.	7.7	21.0	71.3
18	New technology assist knowledge workers to acquire the learning knowledge.	9.8	19.6	70.6
19	Knowledge workers work in team to create new knowledge.	7.0	9.1	83.9
20	Knowledge workers encourage students to consultate different resources i.e. books, newspapers, radios, or televisions to get necessary knowledge.	7.7	16.1	76.2

III. Knowledge Management (KM) Processes for knowledge storage in Community of Practices (Cops)

No.	Statement	Disagree	Neutral	Agree
1	Knowledge workers have clear strategies for storing knowledge assets.	7.0	22.4	70.6

2	Knowledge workers sure about what kind of knowledge should be stored.	8.4	18.2	73.4
3	Knowledge workers are encouraged to capture experiences and lessons learned from best practices to make them accessible to others.	12.6	26.6	60.8
4	Knowledge workers spend enough time and efforts to contribute to the education's knowledge database.	9.8	28.7	61.5
5	In our community of practice, there is a clear strategy for storing knowledge for future usage.	11.2	19.6	69.2
6	In our community of practice, knowledge workers are given roles and responsibilities for storage and maintenance of knowledge.	13.3	23.1	63.6
7	In our community of practice, knowledge workers have the right systems like databases, intranets, in which we can easily store our documented knowledge.	9.1	25.9	65.0
8	Knowledge workers make their contribution to the organization's knowledge base.	7.7	32.9	59.4
9	Knowledge workers' personal knowledge is made accessible for others.	11.2	25.2	63.6
10	Information Communication Technology ICT techniques assist knowledge workers to sort leaning materials.	10.5	30.8	58.7
11	Tangible materials such as books are stored by category, they could be found out quickly.	11.2	32.9	55.9
12	Knowledge workers usually understand and retell what they learned in their own way.	6.3	27.3	66.4
13	Knowledge workers regularly check their learning progress, clearing the difference between current progress and original plan and analyzing the reason.	9.8	22.4	67.8

IV. Knowledge Management (KM) Processes for knowledge sharing in Community of Practices (Cops)

No.	Statement	Disagree	Neutral	Agree
1	The sharing knowledge strategy of our organization can be realized when knowledge is shared.	11.9	27.3	60.8
2	In our community of practices, knowledge sharing applies more than possessing knowledge.	14.0	28.7	57.3
3	Regulations in our community of practice motivates knowledge workers to share knowledge by building trust, giving incentives, making available time and resources.	4.9	14.0	81.1
4	Knowledge workers spend enough time to share ideas and experiences with each others, even if this is not directly relevant to the existing duty.	12.6	22.4	65.0
5	Knowledge workers know how they can optimally share their knowledge with each other.	12.6	25.2	62.2
6	The way knowledge workers are structured overcomes any barriers for knowledge sharing.	11.2	28.0	60.8
7	Knowledge workers have the right tools, like databases, intranets, team-rooms and e-mail groups to support knowledge sharing.	9.1	38.5	52.4
8	Knowledge workers are encouraged to share their ideas and experiences with others colleagues.	14.0	36.4	49.7
9	By sharing my knowledge I have made a significant contribution to the organization.	12.6	22.4	65.0
10	Knowledge workers consciously develops knowledge sharing habit.	7.7	26.6	65.7
11	Knowledge workers adapt to the rapid social changes and fierce social competition.	10.5	33.6	55.9
12	Knowledge workers participate in learning activities organized by school, working unit or community, such as training, lecture and communication.	10.5	32.9	56.6
13	Knowledge workers understand that there is a lot of working and living knowledge for them to learn and know.	13.3	26.6	60.1

14	Knowledge workers modify learning contents and materials according to the learning situations.	10.5	21.0	68.5
15	Knowledge workers make flexible adjustment to learning plans according to current learning progress and objective conditions.	6.3	23.1	70.6
16	Knowledge workers discuss with friends and colleagues new learning experience.	9.8	26.6	63.6
17	Knowledge workers identify the validity of the acquired learning knowledge " applicability & practicality".	11.9	20.3	67.8
18	Knowledge workers disseminate more knowledge based on best practices.	6.3	30.1	63.6
19	Knowledge workers are able to distinguish the quality of the new acquired knowledge.	9.1	26.6	64.3
20	Knowledge workers have more access first hand experienced knowledge.	8.4	25.9	65.7

V. Knowledge Management (KM) Processes for knowledge usage in Community of Practices (Cops)

No.	Statement	Disagree	Neutral	Agree
1	Knowledge workers have systematic approaches to make optimal use of knowledge in their community processes.	7.0	22.4	70.6
2	Knowledge workers have clear strategies on how they can make optimal use of their knowledge.	9.1	25.2	65.7

3	Knowledge workers are encouraged to make use of the available knowledge.	10.5	26.6	62.9
4	Knowledge workers apply available knowledge to improve jobs.	7.0	29.4	63.6
5	Knowledge workers apply available knowledge to innovate new solutions.	9.8	22.4	67.8
6	Knowledge workers know how to disseminate available knowledge among students.	7.7	23.8	68.5
7	Knowledge workers know how to link knowledge to the duties, processes and activities.	7.0	25.2	67.8
8	Knowledge workers develop systems to make it easier to students to use of available knowledge.	12.6	18.9	68.5
9	Knowledge workers are flexible in applying each other's knowledge, to be more efficient and effective.	11.2	23.8	65.0
10	Knowledge workers prefer to use other people's ideas and suggestions, instead of figuring out the needed experience.	10.5	25.2	64.3
11	Knowledge workers can make appropriate learning goals (short/long-term goals).	10.5	28.7	60.8
12	Knowledge workers come up with various ways to improve their efficiency.	10.5	31.5	58.0
13	Knowledge workers validate their techniques to assess their learning outcomes.	7.7	28.7	63.6
14	Before disseminating new, knowledge workers select suitable content based on their experiences.	11.2	21.0	67.8
15	Knowledge workers can give justifications for the efficiency of the new knowledge..	12.6	20.3	67.1
18	Knowledge workers can make full use of acquired information to assist achieving particular learning goals.	9.8	23.8	66.4
19	Knowledge workers collaborate and integrate approaches to create, capture and use of intellectual assets.	6.3	30.8	62.9

Annex II

List of Research Audits

Name	Position(s)	Organization
Dr. Jarallah Saleh ALGamdi	General supervisor National Center for Education information	Ministry of Education
Dr. Khaled H ALAjmi	General Manager- Safeer Program	Ministry of Higher Education
Engr. Majed M. Almazyed	Director of Technical, Type Approval Technical and Spectrum Affairs	Communication and Information Technology commission
Engr. Mansour S. Alqurashi	Information Specialist	Communication and Information Technology commission
Hasan A.Baabdullah	Senior Business Analyst Information Technology and Communication GM	Ministry of Foreign Affairs
Dr. Abdullah M. Al- Megren	General Manager	Ministry of Higher Education
Dr. Saad M. Alsaeed	Consultant, Supervisor of studies and Assessment Section	Ministry of Higher Education
Engr. Abdulhamid A. Alsaady	Business Development Manager	Ministry of Higher Education
Abdulrahman k. AlMutiri	Director of Electronic Systems at Agency Affairs	Ministry of Higher Education
Fayeq Oweis	Language Services Manager	Google
Indrajit BANERJEE	Director Knowledge societies Division CI/KSD	UNESCO
Abel CAINE	Programmer Specialist Information Society Division Communication and Information Sector	UNESCO

Annex III

Guiding Questions for building research instruments

Questionnaire & Structure Interview

It is argued that it is quite difficult to directly measure the impact of KM activities. However, it could be useful to make the organization's efforts (instead of just its results) in the area of KM more transparent e. g. when reporting, the management of an organization could indicate the effort that has been undertaken to support KM processes. Management should be able to indicate what it has done to stimulate the right processes and organization to build a supporting (technical) infrastructure and, most importantly, to instill the right culture and the right set within organization.

The researcher used the following question to measure how the educational organization is positioned with regard to the basic knowledge processes that are part of the KM framework i.e. identify, create, store, share and use knowledge. The researcher adopted the so-called "7S-MODEL" from McKinsey, which focuses on Strategy, Shared Vision, Style, Staff, Skills, Structure and Systems. The questions are not focusing on the knowledge aspects in isolation relate to the organization as a whole.

General Questions:

1. Does your organization have a clear Mission, Vision & Strategy?
2. Are there any conflicts of interest within your organization?
3. IS the culture in your organization based on trust, respect, collaboration and professionalism?
4. IS the staff highly motivated to contribute to the organization's objectives?
5. Does our organization have the competencies that support your strategy?

The KM Processes:

Identify Knowledge

1. Do you know what knowledge you need to support the strategy?
2. If you would ask any person in the organization what our most important expertise is, you would always get the same answer.
3. Do you look for existing knowledge in order to avoid reinventing the wheel?
4. Do your colleagues know from each other “who knows what”?
5. Do you know how to find the knowledge that is available?
6. Does your organizational structure reflects your areas of expertise?
7. Do you have systems in which you can find the knowledge that you have?

Create Knowledge

1. Do you have an explicit strategy for knowledge development (e.g. research and development) and acquisition (e.g. recruitment, partnerships, and mergers acquisitions)?
2. How should you get new knowledge?
3. How do you acquire and/ or develop new knowledge?
4. Does the staff focus on learning and exploring new ways of working?
5. Do you have developed ways to support the creation of new knowledge?
6. Do you have systems to capture and share new ideas and experiences?

Store Knowledge

1. Do you have a clear strategy for storing your knowledge assets?
2. Do you all agree on what knowledge should be stored?
3. How do you stimulate staff to capture experiences and lessons learned and make these accessible?
4. How long time and effort do you spend to contribute to the organization knowledge?
5. Do you know how and where you can store your knowledge for re-use by others?
6. Do you have assigned roles and responsibilities for storage and maintenance of knowledge?

7. Do you have the right systems, like databases, intranets, in which you can easily store your documented knowledge?
8. Does everyone can make his contributions to the organization knowledge?
9. Do you make your personal knowledge accessible for others?

Share Knowledge

1. Does your organization have a strategy of the realizing sharing knowledge?
2. How does your organization motivate the staff to share knowledge?
3. How long do you spend to share your ideas and experiences with others?
4. How do you share your knowledge with others?

Use Knowledge

1. Do you have a systematic approach to make optimal use of knowledge?
2. How do you make optimal use of knowledge?
3. Are you encouraged to make use of the knowledge that is available?
4. Do you apply knowledge to improve and to innovate in your job?
5. Do you know how we can use the available knowledge in our work
6. Do you know how to link knowledge to the business processes and activities?
7. Are you flexible in applying other people's knowledge to become more efficient, effective ... etc.?
8. Do you prefer to use other people's ideas and suggestions, instead of figuring them yourself? out for myself.

Annex IV

Université Paris 1

PANTHÉON-SORBONNE

Thesis: The Role of Knowledge Management Approaches for Enhancing and Supporting Education:

Researcher: ALOSAIMI, Mansour Daifallah

What is the Purpose of this Study?

You are invited to be in a research study about the Role of Knowledge Management Processes for Enhancing and Supporting education. The purpose of this research study is to evaluate your experiences in the implementation of KM approaches and the extent to which you perceive that these approaches have contributed to change learning and teaching techniques.

How will the study to be conducted?

Interviews will last 45-60 minutes. You will only be asked to participate in one interview – there will be a follow-up email message, but no follow-up interview. You will be given a copy of the transcript of your interview. When answering the interview questions, please be advised that you need not answer any questions which you do not feel comfortable providing a response to. You may skip questions as needed, but please be aware that responding to the interview as thoroughly as possible helps us obtain the best data for analysis.

What are the Benefits of this Study?

You may benefit personally from being in this study. However, the researcher also hope that, in the future, other people might benefit from this study because it will help the Ministry of Education in Saudi Arabia make the best possible decisions about choosing the implementation of KM.

CONFIDENTIALITY

The records of this study will be kept private to the extent permitted. In any report about this study that might be published, you will not be identified. Any information that is obtained in this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required. Confidentiality will be maintained by limiting all access to participant emails and interview audio and transcripts to the research director alone. If data is submitted to another individual for coding purposes, your name will not be included.

If the researcher writes a report or article about this study, he will describe the study results in a summarized manner so that you cannot be identified. You will have the right to review the transcript of your interview and request that any part of it be removed before analysis. Only the research advisor, the researcher, and a consultant will have access to your interview data, unless it is submitted to a transcription facility, in which case your name will be omitted. Data will be used for educational purposes only.

1. How does your organization create a culture of sharing knowledge?
2. How does your organization help teachers to utilize new knowledge in new learning situations?
3. What is the role of the teacher for creativity and innovation in education?
4. Does your organization have a strategy for capturing a new knowledge?
5. How do you like blended learning in your organization?

Annex V

The Role of Knowledge Management Approaches for Enhancing and Supporting Education:

ALOSAIMI, Mansour Daifallah

Interview: 1

1. How does your organization create a culture of sharing knowledge?

Individuals are having trouble accessing the knowledge they need in order to do their job. Not only can they not access it, sometimes the people who have that information refuses to share. It causes distrust among employees, killing any efforts to get your team collaborating. There are 5 ways you can encourage knowledge sharing within your organization:

1. **Mentoring:** Each employee needs a mentor. Someone who can teach them the ropes, answer any questions they may have, and help them succeed within the organization. The mentor should be someone who is willing to truly guide a mentee in the right direction.
 2. **Collaboration Tools:** The right tool makes all the difference, and organizations with healthy collaboration are far more successful than their no-to-so open counterpart.
 3. **Trust:** It is the foundation for any type of functional relationship. If you do not trust your co-workers, you will not be willing to share your valuable knowledge, which just makes for an unhealthy environment.
 4. **Departments vs. individuals:** Seek out specific departments, not just individuals, when looking for a specific piece of information. They do say two heads are better than one, so utilize that in your knowledge-sharing efforts.
-

5. **Rewards:** Reward for contributing valuable information. Recognition is the number one way to satisfy an employee, so give them a shout out in front of the entire organization.

2. How does your organization help professors to utilize new knowledge in new learning situations?

- The professors can encourage their students to develop procedural knowledge. The concept of practicing and deepening knowledge is brought into focus by the distinction between declarative and procedural knowledge. Procedural knowledge is oriented toward skills, strategies, or processes. The following are examples of procedural knowledge commonly taught in school: (e.g. Reading a contour map, Editing a composition for overall logic, Sounding out an unrecognized word while reading).
- Over time procedural knowledge is shaped by the learner. This reshaping involves adding steps, changing steps, and deleting steps. When fully developed, procedural knowledge can be performed at a level of automaticity or controlled processing.
- Automaticity means that the learner can execute the process without consciously thinking about the parts of the process. An example would be the skill of sounding out a word not recognized by sight. Once this process is learned, the student can execute it without much conscious thought. Other processes such as editing a composition require a little more thought. When a student knows how to edit, he must typically think about the process to execute the steps effectively. This is called controlled processing as opposed to automatic processing. Frequently, the term *fluency* is used to describe the development of a skill or process to the level of automaticity or controlled processing.
- The most effective professors presented only small amounts of material at a time. After this short presenting, these professors then guided student practice . . . guided practice is the place where students—working alone, with other students, or with the professor—engage in the cognitive processing activities of organizing, reviewing, rehearsing, summarizing, comparing, and

contrasting. However, it is important that all students engage in these activities.

3. Does your organization have a strategy for capturing a new knowledge?

In my organization the strategy for capturing knowledge begins with establishing knowledge management objectives. Before selecting a tool, defining a process, and developing workflows, you should envision and articulate the end state. For the accomplishment of this duty and to build the appropriate program objectives, you need to identify and document the working problems that need resolution and the work contributors who will provide justification for the endeavour. The organization worker need to be provided both short-term and long-term objectives that address the work problems. Short-term objectives provide validation to the program progress, while long-term objectives will help to create and communicate the big picture.

4. What is the role of the Professor for creativity and innovation in education?

Professors try out new ideas and approaches in their classrooms and also they are open to failure. Trying new things enables them to find novel, interesting approaches to teaching—and to find out which novel approaches work. Professors create the kind of environment where students feel able to make mistakes and know that making mistakes is part of our work and our process. In the meantime, they need a willingness to be able to manage ambiguity. Creativity needs to be about the ability to make mistakes, to learn from those. When students see that kind of risk taking and iterative process, I think it helps them understand how to do things well themselves. Ultimately, what students will gain from your class is not necessarily all content knowledge. Often, it's how you approach things.

Risk taking requires a school environment and leadership that allows experimentation. My principal over the years has been very supportive. It is OK to try

new things which leads to good results on measuring achievement of objectives. I can see the students' passion for learning, and the excitement about being at school. There are some procedures to adopted by them, as follows:

1. **Embrace creativity as part of learning.** Create a classroom that recognizes creativity. You may want to design awards or bulletin boards to showcase different ways of solving a problem, or creative solutions to a real world scenario.
2. **Use the most effective strategies.** Torrance performed an extensive **meta-analysis** that considered the most effective ways to teach creativity. He found that the most successful approaches used creative arts, media-oriented programs. Programs that incorporated cognitive and emotional functioning were the most successful.
3. **Think of creativity as a skill.** Much like resourcefulness and inventiveness it is less a trait and more a proficiency that can be taught. If we see it this way, our job as educators becomes to find ways to encourage its use and break it down into smaller skill sets. Psychologists tend to think of creativity as Big-C and Little C. Big C drives big societal ideas, like the Civil Rights movement or a new literary style. Little C is more of a working model of creativity that solves everyday problems. Both concepts can be included in our classrooms.

For Professors, becoming an intellectual risk taker comes down to trying new things in the classroom as often as possible. This doesn't mean Professors can't have some tried-and-true activities that always are a part of their practice. It simply means that teaching practice can only be creative when it's always evolving. Admittedly, the current education climate can make risk taking difficult. School administrators play an important role in establishing a climate that accepts thoughtful experimentation. To empower Professors to be innovative and try new things in the classroom, school leaders must be open to listening. If a Professor has an idea or wants to try something new, a leader should be willing to listen, discuss, and collaborate on ways that idea might be implemented. Another key point is to give Professors ownership of their successes. When a new idea is carried out skillfully, hold up the Professor who

spearheaded it as a model of successful creativity. Having creativity modeled and publicly appreciated within the school culture is vital to cultivating it.

5. How do you like blended learning in your organization?

Blended learning is the use of an online component to classroom education. It is the use of more than one delivery method to provide and enhance learning. There are number of blended learning advantages, as follows:

1. Professors and learners are not limited to adopt one medium to meet the learning objectives.
2. It promotes a continuous learning approach which is more effective at creating change and deep learning.
3. It provides more opportunities for social learning, collaboration, increased participation and informal strategies.
4. It provides students with more opportunities to implement skills.
5. It encourages faster development and less costs depending.
6. Learning materials can reach different locations at different times at the connivance of the learners.

We can conclude that blended learning can incorporate any strategies. It can facilitate the participation of all learners in forum discussions.

Interview: 2

1. How does your organization create a culture of sharing knowledge?

It is said that knowledge is power. This feeling can obstruct knowledge sharing. I will say the following to promote knowledge sharing:

1. Knowledge management (KM) is building culture of knowledge learning, sharing & development.
2. Only some businesses have been able to develop a culture of KM & knowledge

- sharing; most organizations have no strategy for sharing knowledge with staff.
3. Making information available at all level: Is issue of organizational culture and leadership; so it is important to have leaders in the organization who can inspire the knowledge workers
 4. Need to undertake effective education and training to develop knowledge-sharing culture in the organization.
 5. Develop shared vision and team-working culture so that there is no competition amongst workers.
 - 6 People normally have a habit of knowledge-hiding with peers; so there is a need to build incentives for knowledge-sharing.
 7. Develop effective interventions such as mentoring, coaching counseling for changing the mental models (Peter Senge) i.e. people assumptions, values, and attitudes.
-

2. How does your organization help Professors to utilize new knowledge in new learning situations?

- Professors can adopt, *reviewing* and *revision*. Students require about four exposures to new informational knowledge to adequately integrate it into their existing knowledge base. These exposures should not be spaced too far apart: “We found that it took a minimum of three to four exposures with no more than a two-day gap or ‘time window’, between each one for these experiences to become integrated as a new knowledge structure”. This observation makes intuitive sense and is supported in part by some of the brain research. Students need time to think about new insights and awareness.
- The activities engaged in during these exposures should possess certain characteristics. Here we consider three activities that qualify as useful ways to deepen students' understanding of declarative knowledge.
- Revising a composition is obviously a critical step in the generation of an effective essay. Unfortunately, without structure and guidance students' revisions can be highly superficial. The learner begins with a fuzzy, partial

knowledge. Over time with extended exposure, the learner sharpens and adds to his or her knowledge. To this end, revision activities should require students to add new information to the topic being revised as well as correct errors and clarify distinctions.

3. Does your organization have a strategy for capturing a new knowledge?

I believe that vivid strategy for capturing a new knowledge **is the one that it should prepare for change.** It should involve cultural changes in the way employees perceive and share knowledge they develop or possess. In order to increase the sharing of knowledge, we recognize the individual performance. We successfully implement a new knowledge management program that requires changes within our educational organization's norms and shared values; changes that some people might resist to quash. We can minimize the negative impact of such changes, if we follow an established approach for managing cultural change.

4. What is the role of the Professor for creativity and innovation in education?

Taking knowledge out of a vacuum and infusing it into an authentic experience ensures that creativity is grounded in relevant learning. All the Professors cited lessons they had taught that had real-world applications. The fact that the Professors viewed "real-world" learning as creative tells us that such teaching moments often feel fresh and bring in novel thinking. For example, Professors can begin their school day with something authentic where student collect data about daily life and like it to the newly learned material. They would spread out on the school courtyard. We'd talk about the clouds and the humidity and the weather and the wind direction, and we'd collect scientific data. [Later] the students would go online and send the data to scientists at KACST It was a project going on all over the world, where kids were sending sky watch information to scientists.

1. Participate in or create a program to develop creative skills. Programs like *Odyssey of the Mind* and *Think quest* bring together students from around the world to design creative solutions and bring them to competition.
2. Use emotional connections. Research suggests that the best creativity instruction ties in the emotions of the learner. In the “Odyssey angels” program students can devise a solution to help their local community. It gives some valuable information about this type of teaching.

Research suggests that the best creativity instruction ties in the emotions of the learner.

3. Use a creativity model. The Osborne-Parnes model is oldest, widely accepted model. It is often used in education and business improvement. Each step involves a divergent thinking pattern to challenge ideas, and then convergent thinking to narrow down exploration. It has six steps, as follows:
 - *Mess-finding*. Identify a goal or objective.
 - *Fact-finding*. Gathering data.
 - *Problem-finding*. Clarifying the problem
 - *Idea-finding*. Generating ideas
 - *Solution-finding*. Strengthening & evaluating ideas
 - *Acceptance-finding*. Plan of action for Implementing ideas

Considering these two examples from Professors (out of many similar ones), we believe Professors of all subjects or grades should consider ways they might connect (even in small ways) ideas and topics they teach to events and contexts in the real world. The place to begin is often to just consider examples of how these topics already inhabit the world around students. For example, in what places might a Professor help students connect to science in the community? If the unit is on bacteria, can students collect and sample bacteria cultures from within their school environment or conduct a unit on food safety in the school cafeteria or a local restaurant?

5. How do you like blended learning in your organization?

In our institution we design blended instruction as an effort to identify effective design strategies for this approach; I would describe blended learning in our university as follows

1. The staff usually choose approaches that will fulfill the learning outcomes, rather than focusing on a specific technology.
2. They know the underlying purpose for using a blended approach; to reach a wider audience or to meet the needs of varied learners.
3. They determine how the components of a blended strategy will fit together as a whole; to link the learning experiences to each other to reinforce them to meet the learning objectives.
4. They usually take learners' preferences into account to discover the learning environments they prefer.
5. With blended learning approaches, they have more options. There are numerous online technologies, such as coaching, mentoring and shadowing experts.
6. Blended learning provides ways to build community, when it is appropriate for the audience and content. Professors can make interaction and engagement of the blended approaches.
7. As to develop our methodology, we usually evaluate blended programs with a pilot version. We need to be sure that learners can understand how it works and which aspects are motivating and which are frustrating. After that, we implement a continuous improvement strategy.
8. For quality purposes, we provide an orientation and rationale for using blended learning. This is done at an organizational level, to be understood by the upper management.

Interview: 3

- 1. How does your organization create a culture of sharing knowledge?**

You can implement a knowledge sharing culture technically. You'll want to identify the experts, facilitate the capture of information & knowledge via technology, and track the outcomes in order to optimize your methods in the future.

The first step is to identify the leading thinkers in your organization. Note that this directly correlates to the concepts I expressed at the top of the hour. Remember: Identify, Capture & Share. Identification of the big ideas and knowledge in your organization can often be linked to the identification of the thought leaders in your organization. Look for people who have demonstrated innovative thinking, who are quick to express ideas at meetings, or who have been identified as experts by others. You might also look for people who seem to cause bottlenecks, or who everyone misses seriously when they are absent. These are the individuals most likely to have vast hoards of knowledge that you'd love to unlock. And these are the people who you'd really want to get working actively and willingly on the sharing of knowledge. You'll want to work with this group to get consensus, to reassure them and dissuade any concerns about sharing information and ideas. You'll also want to incentivize their participation.

Once you've got buy-in, you'll need to create a technology infrastructure that can support both a water-cooler like sharing atmosphere, and an ongoing record of the knowledge, which is useful for application of the shared knowledge down the road. There are a variety of technologies that can support modern threaded discussions and social interaction, but virtually none that leave the humanity – the individuality in the communication. Let's face it; you lose a lot when the conversation is entirely text.

Adobe engineers looked closely at this problem from a technical perspective and found that while there very little had been done to remove the technical roadblocks to facilitating knowledge sharing. We knew we had an application – called Adobe Presenter, that facilitated training and information sharing by enabling people to effortlessly add audio and some interaction to their PowerPoint decks. But research shows that capturing more of the expert – ideally video is the ideal solution to creating an engaging and relevant record of ideas and information. It was in that light that the team created a new branch – a video branch that enables people to create production quality videos with just a few buttons.

It is hands down the easiest way in the world to create professional quality videos, from the comfort of your desktop. Notably, the Adobe Presenter Video Creator solution solves the Capture, retention and transfer problem. It provides an easy to implement technology that fills this middle ground. As we look forward I'm sure that additional technologies will emerge, giving us more and more options to consider for capturing a record of these ideas.

Finally you'll want to track the outcomes of your knowledge sharing initiative. There are a variety of elements that can be tracked. You'll want to keep a record of communications that employees have which involve knowledge sharing so that you can include those efforts in annual reviews, and so that you can cultivate the most important ideas and information to be used in the innovation. In fact, as innovation is our key objective, you'll want to ensure that the innovation projects are directly rooted in the records created by the knowledge sharing culture.

2. How does your organization help professors to utilize new knowledge in new learning situations?

Identifying similarities and differences is a common instructional activity that appears to pay dividends in terms of knowledge development. Apparently, this process is basic to human thought.

There are at least four general types of tasks that facilitate the identification of similarities: comparing, classifying, creating metaphors, and creating analogies. The action steps in this chapter provide examples of these four processes. Briefly, though, *comparing* is the process of identifying similarities and differences among or between things and ideas. Technically, comparison involves identifying similarities, and contrast involves identifying differences.

- *Classifying* is the process of grouping things that are alike into categories based on their characteristics.
- *Creating metaphors* is the process of identifying a general or basic pattern that connects information that is not related on the literal or surface level.

- *Creating analogies* is the process of identifying the relationship between two sets of items—in other words, identifying similarities and differences between relationships.

Students usually engage in courses at higher education institutions in another country. The experiential learning component is the cultural immersion which provides novel challenges for navigating living in a new place. The coursework connected to a study abroad can also include internships and service-learning experiences.

Experiential learning does not belong in the university where the emphasis should be on the learning of concepts and theories through study and reflection on the abstract. Professional schools move beyond this view because the purpose of their programs is to help students know what to do in concrete practice and foster regularity in practice. Proponents of experiential learning cite the importance of learning in context. According to the theories of situated cognition and situated learning, learning is an integral and inseparable aspect of social practice and people think and learn differently in different social contexts. Experiential learning acknowledges that the unpredictable situations in the authentic social context supports students in formulating and solving problems in different ways and improvising upon best practices in order to create new learning.

This debate over the place of experiential education in higher education weighed against the desire to respond to what we know about how learning works and the pressure to have the university weave theory and practice to support the success of students in the 21st century leads to a great opportunity for dialogue and fresh ideas with related research about how a research university can provide viable solutions.

3. Does your organization have a strategy for capturing a new knowledge?

Based on my experience the most effect method for capturing a new knowledge is to facilitate the effective management of the organization's knowledge assets. Professors should begin a high-level knowledge management process. The process can be progressively developed with detailed procedures and work instructions. Consequently, knowledge is identified, captured, categorized, and disseminated will be ad hoc at best. There are a number of knowledge management

best practices, all of which comprise similar activities. In the meantime, these activities include knowledge strategy, creation, identification, classification, capture, validation, transfer, maintenance, archival, measurement, and reporting.

4. What is the role of the Professor for creativity and innovation in education?

Research shows that the most accomplished, innovative people in any field are also highly creative in areas outside their professional lives. They actively draw on outside interests and creative ways of thinking to improve their professional practice. Professors with special interest and talent find many ways to infuse into their teaching. These professionals connected their hobbies and creative passions to ideas or subjects they teach by seeing and deliberately exploring connections between their interests and school subjects. Sandra, a high school English Professor and recent National Professor of the Year award winner, said,

Outside pursuits always factor into your thinking about your classroom or your students. I think that we teach who we are, and I know that I teach who I am. Whatever it is that interests you that energy manifests itself creatively in the fabric of the classroom.

Teaching with the arts naturally becomes a key part of such connections. This could mean incorporating design activities into teaching science or having students write songs to learn a certain piece of information. One Professor with an interest in photography, design, and visual arts has students create artistically designed "advertisements" for science concepts, such as a poster to sell the concept of chloroplasts (for photosynthesis) to an animal cell (animals don't have chloroplasts, so students must convince them of the value of having chloroplasts or a cell wall). Another Professor, who has an interest in rap and a talent for rhyming, has created engaging mathematics lessons that involve rapping about math ideas. These lessons have been key to getting his students excited about math.

The crucial point is not that these Professors used art or music (which some might find daunting), but that they turned their personal interests and creativity into valuable teaching techniques.

Professors wove in not only their hobbies, but also their subject-matter interests. For example, a middle school algebra Professor with an interest in sociology began to integrate sociology into his word problems and math scenarios. He came up with problems and applications of mathematics that were relevant and engaging for his students.

1. Consider how classroom assignments use divergent and convergent thinking. Standardized tests do a great job of measuring convergent thinking that includes analytical thinking or logical answers with one correct response. Divergent thinking considers how a learner can use different ways to approach a problem. It requires using association and multiplicity of thought. We should design assignments that consider both types of thinking models.
2. Creativity flourishes in a “congenial environment. Creative thinking needs to be shared and validated by others in a socially supportive atmosphere. Researcher coined this term, to explain the importance of reception from others. Others consider how to create communities that foster social creativity to solve problems.
3. Be aware during discussions. You know that student who often asks the question that goes a bit outside the lecture? Well, engage him. Once a week, intentionally address those questions. Write them down on an assigned space in the board to go back to later. Validate their creativity.

The best way for Professors to start may be to take one step. Wherever possible, Professors should tap into their own interests and hobbies and begin to think of themselves as creative Professors and individuals. The interest area doesn't have to be a direct match with the subject matter. Consider areas of crossover, where two different subjects might touch on each other. For example, one high school English Professor taught a lesson on narrative movements in a text by Kafka by discussing how these transitions related to movements in a piece of music.

During both pre- and in-service programs, Professor educators should encourage new Professors to tap into their passions. Professor educators might assign their students to plan a lesson connected to a certain subject matter that makes use of any hobby or outside interest. This lesson could extend from something as simple as incorporating music into class to something as complex as organizing students into special interest groups to argue for or against policies directly involving renewable energy. As Professors begin to consider how they can teach science through an artistic lens or work sociology into math problems, the curriculum becomes unique and interwoven with personal interests.

5. How do you like blended learning in your organization?

We used to favor face-to-face but now we adopt blended learning. Blended learning is the idea that bringing a range of learning interventions together to give the best bits of both the offline and online learning together to benefit the overall experience. It increases engagement, motivating staff to learn and making learning a lot more interesting. It is flexibility and independence.

Blended learning today allow us to work far more flexibly than we have been able to in the past. For example, mobile learning and cloud to support learning are common possibilities today. We have far more opportunities to reach students and learners than ever before. In our learning environments blended learning is implemented as follows:

1. Increased connectivity to stream videos and share informal learning experiences via internal and external social media.
2. Informal learning is pushed forward by the rise of mobile devices in the workplace.
3. Advances in multi-device authoring tools and tracking standards, namely Experience Application Programming Interface (API), mean that all aspects of the learning experience can be tracked in great detail. The former not only allows multi-device content to be built cheaply, but Experience API tracking tells you exactly what devices are being used for learning, what informal

learning activities are taking place and so much more, allowing you to paint a picture of how your people like to learn, informing future blended learning interventions.

Interview: 4

1. How does your organization create a culture of sharing knowledge?

Knowledge management is of course entirely dependent on the context of educational organizations today. It can be difficult to toss all large organizations into a single bucket. Corporate cultures can vary enormously, depending largely on the policies and histories they've experienced to date. There are, however, some commonalities that are frequently seen across various enterprises. Those are usually things like knowledge hoarding that relate to universal human behaviours.

Nobody wants to lose their job. So the idea of knowledge hoarding to protect one's job is present wherever employees have witnessed downsizing, firings, or layoffs that the employees have regarded as arbitrary or capricious. If someone's departure seemed unfair, you're likely to consider whether or not you could simply be pummelled by the almighty hand of ... 'the boss.'

Some people argue that there is no difference 50 years ago. Why should we change now? The traditional culture of knowledge hoarding to a culture of knowledge sharing. One thing is clear when we start to examine this kind of cultural shift is that we are working with real people, who have deeply held beliefs and deeply entrenched behaviours. Motivating positive change can be extremely difficult, but it is impossible if the organization doesn't make a significant change in terms of its management policies and choices. In order to adopt a policy of knowledge sharing, and maintain that level of innovation – organizations will have to create atmospheres in which sharing knowledge is 'safe'. In other words, you can't just mine the knowledge of the top performers, and then fire them all and replace them with earners. Such behaviour will be detected by employees immediately, and you'll end up with a culture far worse than you had to begin with. However, if your desire to innovate is authentic, and your belief in knowledge sharing as a road to that goal is genuine, you can

approach the problem transparently and it is possible to implement this sort of approach. After all, there is something in it for everyone.

2. How does your organization help professors to utilize new knowledge in new learning situations?

Asking students to do homework is very essential for practicing and deepening knowledge. Homework is typically defined as any professor-assigned task intended for students to perform outside school hours. One of the most common reasons cited for homework is that it extends learning opportunities beyond the school day. This logic might have merit in U.S. K–12 education because “schooling occupies only about 13 percent of the waking hours of the first 18 years of life,” which is less than the amount of time spent watching television. For some professional training such as students in pre-professional and pre-service professor education who are gaining required and evaluated experience in supervised teaching.

- **Practicum** - A relative of the internship, this form of experiential learning usually is a course or student exercise involving practical experience in a work setting (whether paid or unpaid) as well as theoretical study, including supervised experience as part of professional pre-service education.
- **Undergraduate research experience** – Students function as research assistants and collaborators on faculty projects.
- **Community-based research** – Faculty and students cooperate with local organizations to conduct studies to meet the needs of a particular community. Students gain direct experience in the research process.
- **Field work** - Supervised student research or practice carried out away from the institution and in direct contact with the people, natural phenomena, or other entities being studied. Field work is especially frequent in fields including anthropology, archaeology, sociology, social work, earth sciences, and environmental studies.

3. Does your organization have a strategy for capturing a new knowledge?

Many organizations leap into a knowledge management solution without first considering the purpose or objectives they wish to fulfill or how the organization will adopt and follow best practices for managing its knowledge assets long term. A successful knowledge management strategy will consider more than just technology. An organization should also consider:

- **People.** the ability of individuals within the organization to influence others with their knowledge.
- **Processes.** to establish best practices and governance for the efficient and accurate identification, management, and dissemination of knowledge.
- **Technology.** how to choose, configure, and utilize tools and automation to enable knowledge management.
- **Structure.** how to transform organizational structures to facilitate and encourage cross-discipline awareness and expertise.
- **Culture.** how to establish and cultivate a knowledge-sharing, knowledge-driven culture.

Moreover, one of the best strategy for capturing a new knowledge is to determine and prioritize the knowledge management technology needs to understand the benefit of each type of technology. The knowledge management program is well underway if there is broad support and a need for enhanced computing and automation.

4. What is the role of the Professor for creativity and innovation in education?

The Professors' role nowadays is to encourage students to participate in generating knowledge and to enhance authentic experience through creativity. The ultimate goal is to allow students to implement their knowledge in the real-world environment to

fulfill the requirements of the labor market. Professors become autonomous and they view real-world learning as creative. They can raise issues from social life and apply newly learned theories. For example, they can describe how often people share new values: My students do a newsletter to report the needs of a demographic group that cannot meet its "*Citizenship Dream*." The students interview people from the community to understand the full picture. They newly gained knowledge can be used for enhancing the concept of *Citizenship Dream*. The techniques adopted as follows:

1. Consider a cultural artifact: Experimental social psychology finds that artifacts can enhance insight problem solving. Consider using an ordinary object, such as a light bulb used in the study or a historical artifact to have students think about living in a particular time period.
2. Use creativity positively: Professors need to reward students for thinking of problems in varied ways by recognizing their efforts, they should avoid talking about creativity in a negative light. When students make mistakes they learn new lessons.
3. E. Paul Torrance designed the Incubation model which it involves 3 stages, as follows:
 - a) Professors make connections between the classroom and student's real lives. "Create the desire to know".
 - b) They go further to deepen expectations: to engage the curriculum in new ways. Brainstorm and create opportunities to solve a novel problem.
 - c) They need to continue the thinking beyond the lesson or classroom and to find ways to extend learning opportunities outside the school environment at home or even the community.

Considering these two examples from Professors (out of many similar ones), we believe Professors of all subjects or grades should consider ways they might connect (even in small ways) ideas and topics they teach to events and contexts in the real world. The place to begin is often to just consider examples of how these topics already inhabit the world around students. For example, in what places might a Professor help students connect to science in the community? If the unit is on

bacteria, can students collect and sample bacteria cultures from within their school environment or conduct a unit on food safety in the school cafeteria or a local restaurant?

5. How do you like blended learning in your organization?

Blended learning is a learning infrastructure. It is seen as something that is not only expensive. While blended learning involves stakeholders and alignment with overall organization, there's no reason why Professors and educators can't begin to create their own blended learning aspects to support face-to-face or e-learning interventions. For instance, nowadays there are a number of authoring tools allow content to work across all devices, allowing users to pick your courses up when it suits them on their mobile, tablet or desktop. This begins to support the idea of blended learning, but we need to continue to encourage informal learning and performance support via the multi-device output of an authoring tool without explicitly making a full e-learning course.

Digital resources to sit alongside an e-learning course or face-to-face course session is necessary, and then we add blended elements to the learning environment. It's important to remember that this isn't going to be a full blended, but taking aspects out of a course and making them small tasks and resources in their own right could transform how learners in our educational organization approach courses.

Interview: 5

1. How does your organization create a culture of sharing knowledge?

The definition of knowledge management in the corporate context is "Managing knowledge effectively is about identifying critical knowledge areas that will make a 'big difference' through *Identify The Big Stuff*. KM involves "capturing and synthesizing new learning's and ideas" that is, capture a record of the important stuff we have learned. Next knowledge management to be complete, knowledge sharing

must occur. Hence, it includes “retaining knowledge, transferring or sharing knowledge. In other words, share & transfer knowledge in a broad way among employees.

Consequently, without using the ideas and knowledge that we’ve worked so hard to cultivate and share, the process cannot payoff, applying knowledge to make the best decisions requires the best communications, collaboration, learning and knowledge strategies, processes, methods tools and techniques, the last principle, we should apply what you learn in order to innovate.

2. How does your organization help professors to utilize new knowledge in new learning situations?

Cooperative education – Mostly a part of professional programs, students gain practical relevant work experience over a period of multiple terms that intersperse their coursework. Students alternate work and study, usually spending a number of weeks in study (typically full-time) and a number of weeks in employment away from campus (typically full-time). Alternatively, cooperative education may occur when students simultaneously attend classes part-time and work part-time during consecutive school terms in an intentionally planned and coordinated way. Students receive academic credit for cooperative education when the experiences meet the criteria for credit (i.e., faculty supervision, reflective components, evidence of learning). The purpose of these programs is to build student’s career skills and knowledge.

Clinical education – This is a more specifically defined internship experience in which students practice learned didactic and experiential skills, most frequently in health care and legal settings, under the supervision of a credentialed practitioner. It is often is a separate credit-bearing course tied to a related theoretical course or a culminating experience after a sequence of theoretical courses.

Family contribution: Parent–child relations purposes are assignments calling for students to show or explain their written work or other products completed at school to their parents and get their reactions or to interview their parents to develop information about parental experiences or opinions relating to topics studied in social

studies. Such assignments cause students and their parents or other family members to become engaged in conversations that relate to the academic curriculum and thus extend the students' learning. Furthermore, because these are likely to be genuine conversations rather than more formally structured teaching/learning tasks, both parents and children are likely to experience them as enjoyable rather than threatening.

3. Does your organization have a strategy for capturing a new knowledge?

It is argued that the first step in development is assessment. I suggest that the best strategy for capturing a new knowledge assessing the current state of knowledge management within the organization. The knowledge management assessment should cover all five core knowledge management components: people, processes, technology, structure, and culture. Normally, a typical assessment should provide an overview of the assessment, the gaps between current and desired states, and the recommendations for attenuating identified gaps. The knowledge management strategy should increase staff productivity, product and service quality, and deliverable consistency by capitalizing on intellectual and knowledge-based assets.

4. What is the role of the Professor for creativity and innovation in education?

Collaborative efforts develop creativity. Professors collect different ideas and share them among the colleagues. It is argued that multiple brains focusing on one idea or one goal, the potential is exponential. They can start brainstorming ideas and bouncing them off one another. Professors consider creative inspiration can raise in the course of individualized work or play. Meanwhile, having the opportunity to talk through existing ideas and get new ones from others is an excellent creative catalyst. Researchers note how to build a collaborative creative community: they start a group at my department; we begin to meet once a month. We agree that everyone is to bring to the table something new, something of their own to offer, so that we could share ideas and try out things that had been successful in other classrooms. I suggest these techniques as follows:

- a) Establish expressive freedom. The classroom environment must be a place where students feel safe to share novel ideas. Allow for flexibility and create norms that foster creative approaches.
- b) Be familiar with standards. Knowing the standards inside and out helps find creative solutions in approaching a lesson. Professors can adapt them and work within the current framework. Some topics allow for flexibility and use of creative approaches.
- c) Gather outside resources. There are some great resources to read related to creativity. The University provides an array of amazing resources related to how to foster creativity in practical ways. It also gives a list of programs and organizations that can help with the process.

Professors should seek out colleagues to ask questions of and share lessons and ideas. It's important that administrators who recognize the need for creativity in teaching ensure time for Professor collaboration and give Professors space—physically and figuratively—to share with colleagues. They should set up a regular meeting time for Professors to get together and talk or share ideas. How this is organized may depend on the setting and the Professors themselves, but sessions should have a relaxed feeling. It's important to highlight creativity as a focus, such as by asking everyone to contribute an original idea from their own classroom to begin the dialogue or brainstorming ways that the arts or cross-disciplinary lessons might be woven into the existing curriculum. Professors tend to share with other colleagues who teach similar content. It's good to encourage conversations among Professors from different subject matters to discuss areas of crossover.

5. How do you like blended learning in your organization?

In our organization blended learning is well-planned. There are a number of factors to consider, such as

- 1. The nature of the course requirement;
- 2. The needs and requirement of our students;
- 3. The technology available and delivery (platform, authoring tool);
- 4. Timescales.

Blended learning is really big project, but with the many devices in the workplace being used for informal and formal learning. it's time you began to think of your authoring tool as something that creates more than just standard e-learning. Professors need to think of your blended learning approaches as a vehicle to create multi-device (or mobile) resources. Not all blended learning tools are capable of flexible tasks. For example, you can create resources and courses via a 21 day free trial today of blended learning software available on online programs. You can benefit from different applications of blended learning and your main source of success would through sharing with colleagues.

Interview: 6

1. How does your organization create a culture of sharing knowledge?

There is a fundamental problem that exists in the typical business workplace today. You may hear a colleague proclaim "If I'm the only one who knows how to do this, 'they' can never fire me. But what is the actual cost of this kind of environment of knowledge hoarding. Research in fact suggests that it cuts much deeper than just the upfront issues with bottle necks and heavy retraining costs. The most serious costs of a knowledge hoarding culture are that the institution is stifled when it comes to innovation.

In today's economy innovation is incredibly important for virtually every organization. The constant quest for innovation is probably what inspired you to check out the latest eLearning blogs and to read an article like this one. We are guaranteed that our competition will innovate, and if we don't, we'll fall behind.

We need to shift from a knowledge hoarding culture to a knowledge sharing culture in our organization. It includes a deeper definition of knowledge management in order to help give a context for the issues of knowledge sharing. It will recount the current corporate climate and provide a hot list of motives to make this change a reality in your organization.

2. How does your organization help professors to utilize new knowledge in new learning situations?

Students have little or no ability to practice on their newly acquired knowledge. They should be provided with a clear model and they should be involved in structured opportunities to practice the new gained knowledge. *Structured* means that the practice tasks are designed in such a way as to maximize students' success rates. Frequently, the practice session focuses on a small part of an overall procedure. These elements have been exemplified and discussed during the critical-input experience. A practice session is scheduled soon after that initial experience, preferably within a day or two. The professor introduces the practice session with a brief review of the procedure. The professor again models the procedure for students to give them a sense of how it works. Students are presented with a few sentences that have words specifically selected because they can be decoded relatively easily by examining the first and last letters. In effect, the practice exercise requires students to use the first step only in the overall procedure. Students are asked to read the sentences on their own, paying attention to the target words that require the strategy. After each student has had time to read the passage and try the strategy, volunteers are asked to describe how they used the strategy with the target words. In short, the practice session is structured so that a few well-crafted examples are addressed and discussed.

Experience-based learning activities that often subsume other terms such as cooperative education, service-learning or field experiences. It is often a credit-bearing, free-standing activity in a student's field of interest not connected to a theoretical course. It is usually assessed by a faculty member and supervised by an employer who is not a faculty member. The student may work with practicing professionals, complete a project, attend public events, interview and observe constituents and employees. When attached to a classroom course, a student may spend several hours a week volunteering in an agency, supporting co-curricular activities, shadowing a professional in the field, or observing people in their natural environments. Key to this form of experiential learning is some type of guided reflection. The mission of this experience may be to support the integration of theory and practice, explore career options, or foster personal and professional development.

Out-of-classroom community service experiences/projects attached to courses or a separate credit bearing experience. The location may be the broader community outside the university or one embedded in co-curricular activities. In these

experiences, students participate in an organized service activity that meets identified community needs and reflect on the service activity to better understand course content and gain a broader appreciation of the discipline and an enhanced sense of civic responsibility.

3. Does your organization have a strategy for capturing a new knowledge?

In the time of knowledge economy Professors need to build a knowledge management implementation roadmap. Having a strategy on how to overcome the shortcomings will be critical in gaining leadership's support and getting the needed fund. This strategy can be presented as a roadmap of related projects, each addressing specific gaps identified by the assessment. The roadmap can span months and years and illustrate key milestones and dependencies. A good roadmap will provide some short-term wins in the first step of projects, which will bolster support for subsequent steps. Down the road, they can continue to review and evolve the roadmap based upon the changing economic conditions. They will gain additional insight through the lessons learned from earlier projects that can be applied to future projects as well.

4. What is the role of the Professor for creativity and innovation in education?

Successful instruction design educators develop creativity through collaborative efforts. An elementary school Professor, highlighted the importance of gathering ideas and sharing them with other Professors: Anytime you have multiple brains focusing on one idea or one goal, the potential is exponential. He argues that if a Professor can start brainstorming ideas, he can have new experience. This process needs time to be implemented. Creative inspiration can certainly arise in the course of individualized work. However, the opportunity to talk through existing ideas and get new ones from others is an excellent creative catalyst. *"We build a collaborative creative community, at my department Professors begin to meet in my classroom once a month. Every professor brings a new idea, so that we could share ideas and try out things that had been successful in other classrooms"*. The techniques adopted are as follows:

1. Mistakes are not seen negative, they are seen as a motive to come up with anything original.
2. Participants are given the chance to be creativity. Space for exploration is allowed to discuss ideas.
3. In the meantime, students are given time to ask questions. Professors encourage students to ask questions through designing lessons that allow for wondering and exploration.

Professors create teams to ask questions and share lessons and ideas administrators to recognize the need for creativity in teaching and to ensure enough time for Professor Collaboration and give Professors space to share with colleagues. They should set up a regular meeting time for Professors to get together and talk or share ideas. How this is organized may depend on the setting and the Professors themselves, but sessions should have a relaxed feeling. It's important to ask everyone to contribute an original idea from their own classroom to begin the dialogue or brainstorming ways.

5. How do you like blended learning in your organization?

Blended learning is no longer an option for classrooms. The combination of face-to-face instruction and online learning opportunities allows for individualization, flexibility, and greater chance for student success. Educators have different models of blended learning from which to choose. Educators have developed these models for blended learning, and Professors or schools may select from among them based upon their unique student populations. These models of Blended Learning are as follows:

1. **The Face-To-Face Driver Model.:** This model works best for diverse classrooms in which students are functioning at various levels of ability and mastery. In general, only some students will participate in online learning.
2. **The Rotation Model:** in this model there is a set schedule by which students have face-to-face time with their Professors and then move to online work. This model seems to be most popular in elementary classrooms in which Professors have already used and are comfortable with traditional learning stations and in situation where students can be divided based upon skill levels in reading and math. For

example, students who are performing well in math but not in reading may have face-to-face time with their Professors for reading before rotating to the online learning stations for math. Professors are able to give struggling students more individual assistance based upon their needs.

3. **The Flex Model:** This model relies heavily on online instructional delivery, with Professors acting as facilitators. It appears to be most successful in school settings in which the majority of the student population is considered to be at-risk or having attendance problems.

Interview: 7

1. How does your organization create a culture of sharing knowledge?

That's not to say that curated content isn't important. It is necessary to move beyond to create and reuse more of your valuable knowledge and information. Here are five steps organizations can take to change a "Knowledge is Power" culture to one in which sharing is the key attribute:

1. Foster a mindset that sharing is power. Reward employees for sharing their knowledge through enabling peers to give a thumbs-up on shared content, which provides reputational reward, to gamification that includes a monetary reward for sharing. Different groups within your organization will value rewards differently.
2. Technology makes it to identify the source and level of curation of each piece of information, either by explicit user endorsements or through symbols that identify whether the information has been curated or is in progress. Often, knowledge management practitioners focus on tagging and cleansing data before sharing it, which can take months. Automated processes with technologies can extract and associate tags and metadata, and even generate taxonomies. This allows a faster kick-off and faster success, leading to more interest and resources allocated to knowledge management. Once people realize that their information is valued by others, they end up creating more of it.

3. Communicating the reasons for curation participation. Users are more likely to participate when they know that they also benefit from the efforts of others. You can employ tools here to understand the behavior of employees, identify content that should be officially curated due to popularity, and learn what information is missing based on employee feedback.
4. Trust employees to think. If people understand the consequences of using the wrong information know that information has not been vetted. Plus, peers trust peers and will value their content. Bottom-up messaging, created by peers, is often perceived as more valuable than top-down.
5. Sharing knowledge might feel like what you would be doing. Your initiative would be hanged at high noon, never to be trusted again. However, just as Amazon sifts through millions of titles and presents you with ones that actually interest you, technology can now enable recommendations of knowledge and information – even experts – from throughout your knowledge ecosystem. Suddenly, employees know who and what will help them assist a customer, build a great product, or close a big deal. This was information they didn't know existed.

Sharing is the most powerful attribute for knowledge management. With these culture-changing steps in place educational institutes can unlock the tremendous value in their knowledge and information, regardless of where it is stored. Through a culture of knowledge sharing and the addition of certain technologies, the long tail of enterprise knowledge – which is often hidden away among multiple systems and which may be highly specific, rare, and generally difficult to access and use – becomes available to all employees, and organizations become able to reuse 98 percent of their knowledge and information rather than the 20 percent that is generally curated and packaged for employees to use. Otherwise, knowledge simply sits there and no return can be gained from it. Worse, employees recreate it over and over again or simply make decisions without the right information – certainly a risky proposal.

2. How does your organization help professors to utilize new knowledge in new learning situations?

As time goes on, more and more practice sessions are provided for students that gradually require more examples to be worked on and that gradually become more complex. When a professor has taught a particular procedure for reading a passage, he would present during the critical-input experience a clear model and allowed students brief chances to try the model. The first few practice sessions are designed in such a way those very simple versions of reading passages.

In later practice sessions, more complex aspects of reading passages are required for success.

At the end of each practice session, the professor asks students to share their new awareness regarding the strategy. This helps students shape the procedure to meet their individual needs. One can argue that during the shaping phase of learning a new procedure, students change, add, and delete elements.

Moreover, professors may encourage learners through:

- Select suitable experiences;
- Pose problems, set boundaries, support learners, provide suitable resource, ensure physical and emotional safety, and facilitate the learning process.
- Recognize and encourage spontaneous opportunities for learning, engagement with challenging situations, experimentation and discovery of solutions.
- Help the learner notice the connections between one context and another, between theory and the experience and encouraging this examination repeatedly.

3. Does your organization have a strategy for capturing a new knowledge?

To be practical, Professors may implement a knowledge management strategy for overall effectiveness of the course. This strategy will require significant personnel resources and funding. Be prepared for the long haul, but ensure that incremental advances are made and publicized. As long as there are recognized value and benefits, especially in light of ongoing successes, there should be little resistance to continued

knowledge management investments. By the time, you've got the processes and technologies that will enable and launch your knowledge management program. You know what the gaps are and have a roadmap to tell you how to address them. During the implementation, make sure you are realizing your short-term wins. Without them, your program may lose the support of key stakeholders.

4. What is the role of the Professor for creativity and innovation in education?

Authenticity in deriving new knowledge is a useful creative technique for implementing newly shared ideas. Professors viewed existing-world learning procedure as creative that tells us that such teaching bring in novel thinking. In teaching writing, a professor can use articles from daily newspapers. Students can analyze such articles, taking into consideration grammatical structures covered in the curriculum or they can deal with different styles of presenting ideas and themes. Later, the kids would go online and send their analysis to the journal website to get some feedback from editors. Students can create project in which they meet the needs of a writing course. The suggested techniques are as follows:

1. Professors need to *build confidence* on students that creativity will enhance learning. They will become accountable of their own learning. For example, they might design projects and create an exhibition of their final projects. They become proud of their final work and newly learned presentations.
2. Professors may *encourage curiosity*. Professors should consider what is important to students to start on what drives their own interest to contribute to be a think-tank participant. Thus, Professors duty is to find the source of inspiration from their world since creativity is intrinsic in nature to find what motivates them.
3. Professors should consider the guidelines of the standard curriculum objectives and add a meta-analysis design. For example, reading courses consider communication, comprehension, listening, writing and reading.

5. How do you like blended learning in your organization?

While many “traditional” Professors may resist blended learning environments, this trend is not going away. Students are digitally-oriented, understand the potential for success that blended learning may offer them, and are excited about the opportunities that blended learning offers them. And as school districts continue to experience financial stress in their attempts to find a desk for every student in a traditional classroom, online learning is an efficient and viable solution. There are some blended learning models suggested in our organization, as follows<

1. **Online Lab School Model:** This model involves students traveling to and attending a school with total online educational delivery for entire courses. There are no certified Professors on hand, but, rather, trained paraprofessionals who supervise. This is a good option in the following circumstances: secondary students who need flexibility of scheduling due to other responsibilities; those who choose this option in order to progress at a faster rate than they would in a traditional school setting; and also those s who need to move at a slower pace than traditional classrooms provide.
2. **Self-Blend Model:** This model allows students to participate in traditional classes but then enroll in courses to supplement their regular programs of study. This model is particularly beneficial in the following circumstances:
 - A course that is not offered by the school may be taken by a student who wants additional learning in a specific content field.
 - Students who wish advanced placement courses for early college credit can enroll in courses designed and approved for such.
 - Students who are highly motivated and fully independent learners.
3. **The Online Driver Model:** In this model students work from remote locations (e.g., their homes) and receive all of their instruction via online platforms. Of course, they can check-in with a course Professor and to engage in online activities. It works well for the following students with special needs or with highly motivated and who want to progress much faster than would be allowed in a traditional school setting.

Interview: 8

1. How does your organization create a culture of sharing knowledge?

When professors share their knowledge with their colleagues, the entire educational organization becomes more powerful. Sharing takes many forms, from verbal or digital conversation, to explicitly sending information, to simply providing access to information created by others. As a result of sharing, more information and knowledge will be created and much more will be reused; this leads to better and more informed decisions, better business agility, and radically greater value creation.

With understanding that creating a sharing culture requires giving up some control and embracing crowd-sourcing in some areas, which can be a scary proposition for knowledge management teams steeped in the tradition of knowledge curation. The strategy of enabling access only to curated content cannot foster a sharing culture. Used alone, it leads to the reuse of only a portion of an organization's knowledge and information and creates "knowledge hoarding" behaviors. People become eager for information and knowledge that once they create it or find it, they keep it to themselves in a special spot they think they will remember. Each employee tries to control his or her own access to knowledge.

2. How does your organization help professors to utilize new knowledge in new learning situations?

Professors need to develop a level of fluency. It is important to keep in mind that not all procedures presented to students are intended to be learned to this level. For example, a mathematics professor presents students with a procedure for using a protractor. However, the professor is aware that using a protractor is not a skill all students will require for success later on in school or in life. In such cases, it is appropriate to cease the formal instruction and the practice once students have a general sense of its execution. However, if a procedure is necessary for students' future success in school or in life, enough practice must be provided for students to develop the procedure to a level of fluency.

Practice for the purpose of developing fluency should include a fairly wide array of exercises so as to expose students to different contexts in which the procedure

might be executed. Additionally, the professor should consider accuracy and speed in these practice sessions along with further shaping of the procedure. At this level of learning, students should be able to engage in the procedure independently. Thus practice activities can be assigned as homework when appropriate.

On the other hand, experiences are carefully chosen for their learning potential, to provide opportunities for students to practice and deepen emergent skills, encounter novel and unpredictable situations that support new learning, or learn from natural consequences, mistakes, and successes. Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning, and is challenged to take initiative, make decisions and be accountable for results.

Moreover, reflection on learning during and after one's experiences is an integral component of the learning process. Learners are engaged intellectually, emotionally, socially, and/or physically, which produces a perception that the learning task is authentic.

3. Does your organization have a strategy for capturing a new knowledge?

First of all you will need to measure the actual effectiveness of the existing strategy and compare that to anticipated results. The next step is to establish some baseline measurements in order to capture the organization's performance prior to implement the knowledge management program. After that you implement your strategy and compare the new results to the old results to see how performance has improved. Later, you may establish a balanced scorecard that provides metrics in the areas of performance, quality, compliance, and value. The key point behind establishing a knowledge management balanced scorecard is that it provides valuable insight into what's working and what's not. You can then take the necessary actions to mitigate compliance, performance, quality, and value gaps, thus improving overall efficacy of the knowledge management program.

4. What is the role of the Professor for creativity and innovation in education?

Professors should be opened to new ideas and approaches in their classrooms and they should also accept that failure may take place. Trying new things enables educators to find novel, interesting approaches to teaching—and to find out which novel approaches work. This is called the notion of intellectual risk taking in building a creative teaching practice which is tied to making frequent mistakes. In my case, I create the kind of an environment where students feel able to make mistakes and know that making mistakes is part of learning process. Also, they can be able to manage ambiguity. Creativity needs to be about the ability to make mistakes, to learn from them. Consequently, students will not only gain knowledge, they will gain several techniques and approaches to learn new knowledge. I would propose these techniques:

1. Professors should observe a working model of creativity. One method of observing is to watch a video about how a creative classroom works and see how creativity might play out in a classroom.
2. Professors should consider the work of current experts in the field to adopt an internationally renowned creativity and innovation expert. Such scholars' work is to meet challenges, renovating education to implement different strategies.
3. Professors should explore different cultures. Culture is an inspiring technique for creative thinking. They can understand how cultural contexts are central to creative endeavors and how collaboration between several cultures produces unique and novel ideas.

Teaching practice can be creative when it's always evolving. The education climate can establish a climate that accepts thoughtful experimentation. To empower Professors to be innovative and try new things in the classroom, school principals must be open to listening. If a Professor has an idea or wants to try something new, a school principal should be willing to listen, discuss, and collaborate on ways that new ideas might be implemented. Not to forget an important point here, it is to give Professors ownership of their successes. When a new idea is carried out skillfully,

hold up the Professor who spearheaded it as a model of successful creativity. Having creativity modeled and publicly appreciated within the school culture is vital to cultivating it.

5. How do you like blended learning in your organization?

For most professors, the greatest impact of the internet and other digital tools on their role as professors has been access to more content and material for use in their classrooms and a greater ability to keep up with developments in their field. To a slightly lesser extent, these professors use digital tools to share ideas and experiences with other professors. In terms of professional support and training in how best to use new digital tools in their classrooms, the vast majority of these professors are satisfied with the support and training their colleges provide. At the same time, most say they rely mainly on their own research and experience when developing new ways of bringing technology to the learning process.

The greatest impact professors would get is increased access to content, resources and materials for their teaching. They may benefit from the internet and other digital tools on the range of content and skills they must be knowledgeable about. Just over two-thirds note “major impact” on their ability to share ideas with other Professors and enabling interaction with parents. In conclusion, most of professors have felt that the workload as the internet and other digital tools have facilitated the learning process.

Interview: 9

1. How does your organization create a culture of sharing knowledge?

The real answer is to help people recognize that knowledge sharing is in their personal interest. Today it needs to be explicitly understood that “sharing knowledge is power”. If people understand that sharing their knowledge helps them do their jobs more effectively; helps them retain their jobs; helps them in their personal development and career progression; rewards them for getting things done (not for blind sharing); and brings more personal recognition, then knowledge sharing will become a reality. There are a number of reasons to motivate people to share their knowledge:

- a) Knowledge is a perishable. Knowledge is increasingly short-lived. If you do not make use of your knowledge then it rapidly loses its value.
- b) Even with the low level of knowledge sharing, you need to make your knowledge productive than someone else.
- c) By sharing your knowledge, you gain more than you lose. Sharing knowledge is a synergistic process. For example, if I get into dialogue with the other person then I'll benefit from their knowledge, from their unique insights and improve my ideas further.
- d) Collaboration is needed for enhancing the working environment, hence being open with colleagues sharing with them knowledge, helps you achieve your objectives.

2. How does your organization help professors to utilize new knowledge in new learning situations?

In classroom, a professor briefly summarizes the content and then introduces students to an activity, so they understand the links between the different components of the newly shared knowledge two things that do not seem related on the surface but are related at a more abstract level. In a whole-class discussion, the professor and his students identify some general characteristics of the events. He explains that they will begin the activity in class and finish it as homework.

The next day the professor begins by reviewing the homework with students. He organizes students into groups of five. Each student presents his metaphor assignment to the other members of the group. When all students have reported on the homework in their small groups, he leads a whole-class discussion on the insights students gained from the activity. Throughout the unit, the professor engages students in a variety of activities that help them examine the content in new ways. Frequently, he asks students to return to their academic notebooks and make changes and additions. In some cases, students add information. In other cases students correct initial misconceptions in their knowledge.

The Freshman Research Initiative (FRI) is an example of a program at our university that aligns with Kolb's experiential learning cycle. FRI provides first-year students the opportunity to engage in authentic research experiences with faculty and

graduate students in the sciences. Components of the program that exemplify the Kolb's experiential learning cycle include:

- **Experience:** As a member of a team, students engage in hands-on experiments related to a research project, each situation providing a new experience.
- **Reflection:** Students reflect on their experience with peers, mentor, and research educator. Jointly, they make sense of what happened and note inconsistencies between the experience and their previous understanding.
- **Conceptualize:** Reflection may lead students to develop a new idea or modify an existing concept; in addition, they may participate in a seminar with exposure to additional project-related concepts that may further clarify implications for action.
- **Test:** Students return to their project to apply the new and/or refined knowledge in the research environment to see what happens.

Students participating in the FRI experience continuously engage with the learning cycle and emerge with a deep understanding of the scientific process.

3. Does your organization have a strategy for capturing a new knowledge?

The suitable a strategy for capturing a new knowledge would consist of some steps, as follows:

1. *Identifying the problem:* The technological barriers protecting this knowledge lead users to perceive that there is lack of knowledge. The knowledge segments should be identified.
2. *Preparing for change.* This refers to change in terms of business efforts, especially in how the business is operated.
3. *Creating the team.* Well-build team will enhance the successful implementation of knowledge management. The chief knowledge officer should be appointed to lead the effort.

4. *Mapping out the knowledge.* In every course Professors need to identify what the knowledge is, where it is, who has it, and who needs it. Once the knowledge map is clear, they can define and prioritize the key feature and identify appropriate technologies that can be used to implement the knowledge management system.

4. What is the role of the Professor for creativity and innovation in education?

Normally, Professors develop their creativity through collaborative activities. They prioritize the importance of gathering ideas and bouncing them with other Professors. *"Two heads better than one"*: Usually, we can start brainstorming ideas and bounding them together. This activity is time consuming. Meanwhile, creative inspiration may arise in the course of individualized work through the discussion of the existing ideas.

For example, they can meet once a month to discuss new ideas, so that they could share such ideas and try out things that had been successful. I would suggest the following techniques:

1. find ways to incorporate and integrate new knowledge. Creativity is a central force that shapes school culture. With the changing times, society is enriched by cultural-based creativity.
2. use a collaborative creative thinking model to solve classroom problems. For instance, read a paragraph and then have groups discuss a list of questions. Collaborative problem solving is catching on quickly. Nowadays, a number of business schools in the world have implemented creative thinking models into their curriculum to enhance students aptitudes to be more prolific.
3. In our daily live, we do not see things in a unique case, things come in a multi-case. Hence, Professors may design cases in multidisciplinary lessons. It included works of different topics and subjects to everyday concepts. The subject matter would be so successful. Professors can design an entire unit that focused on how different concepts work together.

Professors should find out colleagues to ask questions of and share lessons and ideas. School leaders in the other hand should recognize the need for creativity in teaching to ensure time for Professor collaboration. Professors should meet regularly to get together and talk or share ideas. It's important to highlight creativity as a focus that everyone to contribute an original idea to begin the dialogue or brainstorming into the existing curriculum. One of the good exercises in this field is to open up conversations among Professors from different subject matters to discuss areas of crossover.

5. How do you like blended learning in your organization?

Implementing blended learning at university level demonstrates positive effects of technology on both learning in a content area and learning to use technology. They use the potential of multimedia and hypermedia technologies. Professors argue that students made statistically significant improvement in their recognition and use of elements such as main ideas, supporting details, and cause and effect relationships. Based in our experience, students' writing abilities are more cohesive than others who are taught using similar materials and sequences but without the use of technology.

The digital tools include a wide range of media forms: images, video and audio clips, hypertext, hypermedia, and Web pages deal with reading comprehension and vocabulary development. In my classes, a wide range of digital tools enhance reading comprehension and vocabulary development by providing students access to word pronunciation, word meaning, contextual information, and comprehension scaffolds to guide an individual's reading. Thus, we can argue that technology enhances all aspects of literacy development.

Interview: 10

1. How does your organization create a culture of sharing knowledge?

Today, the creation and application of new knowledge is essential to the survival of almost all businesses. There are many reasons. They include intangible products - ideas, processes, information are taking a growing share of global trade

from the traditional, tangible goods of the manufacturing economy. Increasingly the only sustainable competitive advantage is continuous innovation. In other words, the application of new knowledge increasing turnover of staff. People don't take a job for life any more. When someone leaves an organization their knowledge walks out of the door with them. Our problem as an organization is that we don't know what we know. Large global or even small geographically dispersed organizations do not know what they know. Expertise learnt and applied in one part of the organization is not leveraged in another. Accelerating change - technology, business and social. As things change so does our knowledge base erode – in some businesses, as much of 50% of what you knew 5 years ago is probably obsolete today.

2. How does your organization help professors to utilize new knowledge in new learning situations?

Knowledge can be deepened by tasks involving comparing, classifying, creating metaphors, creating analogies, and analyzing errors. Many times such tasks are begun in class. However, because of their length, their completion is sometimes assigned as homework. For example, assume a professor begins the following assignment in class. Students work on this assignment in class but then complete it at home. Before the end of class, the professor makes sure that all students have the resources necessary to complete the assignment. In this case, students might need a specific section of the textbook. The involvement of parents in this homework is guided by the following directions:

Your son has homework this evening. It requires them to compare two events we have been studying. The resource students need to complete this homework is pages 65-81 of the textbook. The homework should take no more than 30 minutes to complete. You can help clarify your son's thinking by asking the following questions before and after the homework is completed:

- Who ordered each scientific voyage?
- What areas were explored in each voyage?
- What happened as a result of each voyage?

Experiential learning motivates students. Experiential learning provides the conditions for optimally supporting student learning. When students are engaged in learning experiences that they see the relevance of; they have increased motivation to learn. Students are also motivated when they are provided opportunities for practice and feedback. Experiential learning meets these criteria (Ambrose, et. al., 2010).

Experiential learning creates self-directed learners. Through experiential learning, students are confronted with unfamiliar situations and tasks in a real-world context. To complete these tasks, students need to figure out what they know, what they do not know, and how to learn it. This requires students to: reflect on their prior knowledge and deepen it through reflection; transfer their previous learning to new contexts; master new concepts, principles, and skills; and be able to articulate how they developed this mastery (Linn, et al., 2004). Ultimately, these skills create students who become self-directed, life-long learners.

3. Does your organization have a strategy for capturing a new knowledge?

As we approaching national plan 2020 for the transformation to the knowledge society, I think we need to emphasize the following steps:

1. *Creating a feedback mechanism.* A feedback system should be created to indicate management how the system is used and should report any difficulties.
2. *Defining the building blocks* for a knowledge management system. The base structures of a viable knowledge management system should consist of a knowledge repository, knowledge contribution and collection processes, knowledge retrieval systems, a knowledge directory and content management.
3. *Integrating existing information systems* to contribute and capture knowledge in an appropriate format.

4. What is the role of the Professor for creativity and innovation in education?

The role of Professors for creativity in education is much reflecting their beliefs on the importance of a student who can ready for labor market. They consider creativity as a mind-set that affects how students see the world. They know that insights they might have in one area can carry over into new areas of activity. Hence, they maintain open-minded awareness of interesting things in the world around them, looking for innovative ideas for the classroom. There are several techniques to be adopted such as:

1. Creativity requires people to use different parts of our brain. We often bridge connections between seemingly unrelated areas to make new concepts emerge. Allow students to use their strengths to find new ways of approaching a topic or solving a problem. You might be surprised with what they come up with.
2. Creativity is important to students' future in the job market. Students will work in jobs that are not yet created. They must be innovative and create their own jobs. Professors mainly should focus on teaching particular skills or set of behaviors, rather than preparing students for specific careers.
3. **Creativity should be taught explicitly.** It is said that "*Creative skills aren't just about good ideas, they are about having the skills to make good ideas happen.*" The creative skills should include 5 major areas:
 - Imagination
 - Being disciplined or self-motivated.
 - Resiliency
 - Collaboration
 - Giving responsibility to students. Have them develop their own projects.

Professors might stimulate their creativity by observing the world around them, keeping their eyes open for new ideas. Most Professors keenly observe their classes and students. Extending this observation to look for ideas from other disciplines or from something they see, read about, or interact with in daily life is a good first step. They to consider other people's perspectives. They should ask how a particular class or group of students would want to learn something and what methods could make a topic interesting for that group.

5. How do you like blended learning in your organization?

I would report positive findings from the application of digital learning based on-nearly eight years of studying the effects of computers on the classroom. Students perform better on achievement tests. They develop a variety of competencies not usually measured. For example, students deliver lectures along with their professors. They become socially aware and more confident, communicating effectively about complex processes. They become independent learners and self-starters, worked well collaboratively, and developed a positive orientation to their future. These are the skills that will enable students to live productive lives in the emerging age of communication. Moreover, technology use in the classroom helped to decrease absenteeism, lower dropout rates, and motivate more students to continue on to college.

Researchers find convincing evidence that technology can be effective in teaching basic skills, can significantly improve scores on standardized achievement tests, can provide the means for students with special needs to communicate via e-mail, and can help Professors accommodate students' varying learning styles.

Interview: 11

1. How does your organization create a culture of sharing knowledge?

To create a knowledge sharing culture you need to encourage people to work together more effectively, to collaborate and to share to make organizational knowledge more productive. We need to share knowledge and information to help an organization as a whole to meet its objectives. Moreover, I would emphasize that learning to make knowledge productive is as important as sharing knowledge. Michael Schrage in a recent interview said that he thinks, "Knowledge management is Changing a culture means seeing the world in a different way. It means revealing our hidden paradigms like the tacit acceptance that "knowledge is power".

One example I would cite in this context, experiential learning teaches students the competencies they need for real-world success. Although we can simulate the real world in the classroom and laboratory, authentic experiential learning creates an invaluable opportunity to prepare students for a profession or career, learn the craft of

a fine artist, or discover how the discipline creates evidence to contribute to its body of knowledge. The mission for higher education should be to bridge the gap between theory and practice and the educational environment needs to intentionally create rich connections between the formal and experiential curriculums. Particularly at a research university, we have a responsibility to create situations where students benefit from the abundance of research that is taking place. Experiential learning provides one approach to ameliorating this criticism and mining the richness of the research taking place at the university.

2. How does your organization help professors to utilize new knowledge in new learning situations?

Students must periodically reexamine their understanding of content. Academic notebooks, introduced earlier, are particularly useful to this end. There are some advantages to students keeping their academic notebooks in class. Students can make new entries in their notebooks after homework has been corrected and discussed. Students can reexamine the entries in their notebooks at any point in time—not just after a homework assignment. That is, periodically students are asked to review what they have recorded in their notebooks with an emphasis on identifying those things about which they were accurate initially and those things about which they were inaccurate initially. They also make additions to their notebooks, capturing awareness and insights they might not have recorded before. One variation on this process is to organize students into groups of two or three. Periodically, group members compare the entries in their notebooks. Members of each group identify what they agree on as a group, what they disagree on, and questions they still have about the content. Groups report out to the whole class, and the professor addresses common agreements, disagreements, and questions.

When students are given opportunities to learn in authentic situations on campus or in the community like those provided in internships, field placements, clinical experiences, research and service-learning projects, the learning becomes significantly more powerful. By engaging in formal, guided, authentic, real-world experiences, individuals:

- deepen their knowledge through repeatedly acting and then reflecting on this action,
- develop skills through practice and reflection,
- support the construction of new understandings when placed in novel situations, and
- extend their learning as they bring their learning back to the classroom.

3. Does your organization have a strategy for capturing a new knowledge?

Our organization establishes a conducive culture to build more effective techniques for knowledge creation, transfer, and use to engage in high-level and general efforts to change the organizational norms and values related to knowledge. Professors make efforts to understand the importance of this valuable asset. Effective knowledge management requires a good fit between the organization's culture and its knowledge management initiatives. They need to align their approaches with its existing culture or be prepared for a long-term culture change effort. Good knowledge management practices will make the effort successful. There are essential organizational cultural components with regard to knowledge, as follows:

- ◆ People should have a positive orientation to knowledge, that is, employees should be bright, intellectually curious should encourage their knowledge creation and use.
- ◆ People should not feel that they are not alienated or resentful of the organization and don't fear that sharing knowledge will cost them their jobs.

4. What is the role of the Professor for creativity and innovation in education?

The Professors' role for creativity in learning is grounded in relevant learning environments. Everyday situations provide good sources of knowledge for applications in different learning cases. Students could collect scientific data and then they may share them with others either face to face or online. Later, they can broaden the participation. Students could also interview people from organizations in the

community to figure out the meaning of some social concepts. I suggest some techniques:

1. The most successful approaches are programs that incorporate cognitive and emotional functioning together.
2. Professors should encourage students to use their skills to think creatively, creativity as a learning strategy, to drive societal ideas to solve everyday problems.
3. Creativity instruction should be tied to the emotions of the learner. Students can devise a solution to help their local community, such as helping old people.

To conclude, Professors should consider ways to connect ideas and topics they teach to events and contexts in the existing environment. They should emphasize how these topics are inhabit the normal life.

5. How do you like blended learning in your organization?

There is also a large body of research that supports the benefits of technology for language acquisition. Moreover, there are studies demonstrate that students who learn in existing multimedia and/or hypertext environments show greater gains in areas of language development than students who learn in more traditional environments. Studies investigating the impact of student construction of hypermedia learning environments on language development came to similar conclusions. Hence, we can conclude that technology can be used to enhance language acquisition in the following ways:

1. Enhancing efficiency through digital multimedia which can create stronger memory links than text alone.
2. Enhancing authenticity through which the Internet provides learners with authentic materials, like news and literature, while video can offer context-rich linguistic and culturally relevant materials to learners.

3. Enhancing comprehensibility because the digital reading materials can be hyperlinked to different media, which students can choose to help their comprehension of the material.
4. Providing meaningful and authentic communication opportunities. Students can engage in authentic types of communication through e-mail, chat rooms, and other digital means.

Interview: 12

1. How does your organization create a culture of sharing knowledge?

Create a safe environment for knowledge sharing. That means create a climate where people can be reassured that they will not be at risk for the knowledge and ideas that they share. Studies have shown that there are a few major fears and concerns employees have when it comes to knowledge sharing. Researchers identify these as distrust of management, insecurity in one's job performance & organizational climate. In other words you're afraid that the man is out to get you, you're worried that people will find out you aren't perfect, and nobody else does it, why should I?

These can and should be addressed by creating a shared climate rich in rewards for collaboration and sharing. You will also want to ensure employees that nobody is judging their performance and that these efforts cannot and will not be used to evaluate them. They need to know that their knowledge sharing efforts cannot be used against them in any way, and can only count toward positive outcomes. Finally you'll need to create a framework for sharing, both socially and technologically where the atmosphere is strongly conducive to sharing. You'll need to openly and publicly proclaim this as a priority both for the organization and for individuals.

2. How does your organization help professors to utilize new knowledge in new learning situations?

To help students appreciate that their knowledge and skills can be effectively applied in multiple contexts, point this out to students when it occurs. For example, when my students are tackling a new problem that draws on knowledge and skills they learned previously, I usually identify the general knowledge or

skill and explicitly discuss why it applies to the current situation. In addition, I can create multiple situations or problems that are very different on the surface but that all draw on the same knowledge; then I ask my students to work through these situations, analyzing their similarities. If students have practiced applying their knowledge and skills in different contexts, then they will be more likely to do so on an exam.

When students have the relevant knowledge or skill but do not recognize the opportunity to apply it, giving them a prompt to do so can be very helpful. While a professor may not feel that such prompts are appropriate for tests, providing them on homework assignments can help students practice making connections so they are more prepared to do so on a test.

To help students apply their knowledge and skills more broadly and appropriately, an effective first step is to find out what conceptual relationships they lack or to identify where their knowledge and skills are overly specific. This can be accomplished by conducting a pretest that exposes how students have organized their knowledge. For example, the professor can ask students to construct a concept map in which they first identify all the concepts they associate with a given topic and then draw links between the concepts they consider to be related. Concept maps can reveal when students have divided what he consider a single, unified concept into separate unrelated pieces or when they have failed to associate what you consider highly related concepts. Then he can adjust his instruction accordingly so that students can better access the information they need during an exam.

In conclusion, experiential learning is a learning that supports students in applying their knowledge and conceptual understanding to real-world problems or situations where the instructor directs and facilitates learning. The classroom, laboratory can serve as a setting for experiential learning through embedded activities such as case and problem-based studies, guided inquiry, simulations, experiments, or art projects.

3. Does your organization have a strategy for capturing a new knowledge?

Our strategy is to create an environment for leveraging the organization's intellectual property into a collaborative platform, making this knowledge actionable. *"Knowledge management is about action, not just about collection and consolidation"*. It is about leveraging what the organization knows. Forming a knowledge strategy is straightforward. This strategy is accomplished through different steps: (i) first is to develop sophisticated scenarios for current and future competitive environments; (ii) second is to describe ideal successful organizations and stakeholders with respect of the upcoming implementation; (iii) identifications of the knowledge needed at successful educational organizational; (iv) fourth is to identify the individuals within such organizations who have the knowledge required or the capability to acquire that knowledge. It is important to identify external knowledge sources to help determine and understand current and future customers, suppliers and markets. The source of intellectual capital may not reside within the organization but can be leveraged elsewhere. The step for the organization is to model its efforts on those of a conceptually an ideal university or research center. The business strategy for such an ideal educational institution would include a plan in acquiring and maintaining the necessary knowledge. Once the knowledge strategy is in place, the strategy is set. It is then time to develop the knowledge assets. Such assets should be analyzed in relation to their support of the educational strategy by performing a SWOT analysis.

4. What is the role of the Professor for creativity and innovation in education?

Research shows that the most accomplished, innovative people in any field are also highly creative in areas outside their professional lives. Professors should draw on outside interests and creative ways of thinking to improve their professional practice. These professionals connected their hobbies and creative passions to ideas or subjects they teach by seeing and deliberately exploring connections between their interests and school subjects. I think that we teach who we are, and I know that I teach who I am. The crucial point is not that Professors using such activities, but that they turn their personal interests and creativity into valuable teaching techniques. Professors wove in not only their hobbies, but also their subject-matter interests. For example, a math Professor with an interest in sociology began to integrate sociology

into his word problems and math scenarios. He came up with problems and applications of mathematics that were relevant and engaging for his students.

1. Professors should adopt a creativity model. It is used in education improvement. Each step involves a divergent thinking pattern to challenge ideas, and then convergent thinking to narrow down exploration. It has six steps.

- Identify a goal or objective.
- Gathering data.
- Clarifying the problem
- Generating ideas
- Strengthening & evaluating ideas
- Plan of action for Implementing ideas

2. They should be aware during discussions of student who often asks the question that goes a bit outside the lecture. They should address such questions validate their creativity.

3. I would suggest the following techniques:

- a) To make connections between the classroom and student's daily lives. "Create the desire to know".
- b) To engage the curriculum in new ways. Brainstorm and create opportunities to solve a novel problem.
- c) To continue the thinking beyond the lesson or classroom. Find ways to extend learning opportunities at home or even the community.

Professors should start into their own interests and begin to think of themselves as creative Professors. The interest area doesn't have to be a direct match with the subject matter where two different subjects might touch on each other. They might assign their students to plan a lesson connected to a certain subject matter that makes use of any hobby or outside interest. This lesson could extend to complex matters.

5. How do you like blended learning in your organization?

Technology motivates learners. It allows students to search for information they are passionate about learning. Students are given more choice in their tasks, those tasks are more meaningful and increase the students' intrinsic motivation. Technology can have a positive impact on the self-esteem of students, especially for at-risk students with low self-esteem and self-confidence. When students have access to powerful mobile devices and digital resources that are continually updated, they realize that learning doesn't stop with the last bell of the school day. They become accustomed to learning being an integral part of all aspects of their lives, which establishes ongoing learning habits lasting long after graduation. In addition, technology empowers students to take control of their own learning. By providing students with tools to engage and create, as well as monitor their own progress, students are put in the driver's seat and become owners of the learning process.

According to a recent survey, almost one-third of Professors said that the greatest obstacle to using technology in their classroom was their need for professional development. Our university develops comprehensive plans ensuring that educators can master new technology and harness it to benefit students — while protecting student security and privacy online. Students and Professors need to get tablets and laptops to load them with high-quality educational software and content, and preparing educators on how to use technology to enrich the learning experience.

In addition, technology also allows parents to become more engaged with the learning process through tools that provide real-time access to information about their child's progress and the ability to communicate virtually with school Professors and leaders. Parents are also a key element in teaching safe use of these powerful tools. In collaboration with schools, parents have the important responsibility to teach their children how to be respectful and safe digital citizens.