EXPLORATION OF KNOWLEDGE CREATION PRACTICES OF UNIVERSITY TEACHERS

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Thesis Title: Exploration of Knowledge Creation Practices of University Teachers

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ABSTRACT

Title: Exploration of Knowledge Creation Practices of University Teachers

The study has been carried out to explore the knowledge creation practices used by university teachers. The study is based on Nonaka's Spiral Theory of knowledge creation (1995) that shows conversion of the latest knowledge into the existing knowledge assets within an organization through four practices of knowledge creation i.e. Socialization, Externalization, Combination, and Internalization. The objectives of the study were to, (1) explore the status of knowledge creation practices (SECI) of university teachers (2) explore the sources of explicitness of university teachers (3) compare the knowledge creation practices (SECI) of Public and Private University teachers (4) compare the knowledge creation practices (SECI) of Faculty of Natural Sciences and Faculty of Social Sciences (5) compare the knowledge creation practices (SECI) of male and female university teachers (6) compare the sources of explicitness of Public and Private University teachers (7) compare the sources of explicitness of Natural Sciences and Social Sciences university faculties (8) compare the sources of explicitness of Male and Female University Teachers. The research design was quantitative in nature and a descriptive survey method was used. The study was conducted in Faculty of Natural Sciences and Faculty of Social Sciences in the universities of Rawalpindi/Islamabad. The population of the study was 4195 out of which 12% sample size was taken by using a stratified sampling technique. Standardized scales were used to collect the data. The analysis was done by applying mean value and independent t-test that contained Levene's test. It is concluded that university teachers use all knowledge creation practices. The rank of knowledge creation practices from most to least is externalization, socialization, combination, and internalization. Articles, an educational course, and seniors lectures are the most commonly used sources of knowledge explicitness. The analysis shows that the university teachers are least focused on internalization (learning by doing) knowledge creation practice. Scout method, experiential approach and the training approach may be helpful to improve internalization practices in universities.

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LIST OF ABBREVATIONS

1. KC…………………………..Knowledge Creation

2. R & D……………………….Research and Development

3. SECI……………………….. Socialization, Externalization, Combination and Internalization

4. RBV……………………….. Resource Based View

5. KBV……………………….. Knowledge Based View

6. HRM………………………. Human Resource Management

7. IT………………………….. Information Technology

8. KM……………………….. Knowledge Management

9. CHAT…………………….. Cultural-Historical Activity Theory

10. HEIs………………………. Higher Education Institutions

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Dedication

This dissertation work is dedicated to my supportive parents, family, and friends

for their help and countless prayers during my work

&

My Supervisor Dr. Marium Din for her Supervision.

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I feel highly privileged in taking the opportunity to express my profound gratitude and sense of devotion to my supervisor Dr. Marium Din for her affectionate supervision, support, generous advice, proficient assistance, and word of inspection from time to time. Her guidance helped me throughout research and writing of the thesis.

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The knowledge-based organizations build up an environment that promotes knowledge and knowledge creation practices and contributes to the continuous learning of their members. Knowledge is systemizing humans as human capital (Baetjer, 2002). Knowledge plays a key role in the development of any country, and it is the human capital that can be a major source in the implementation of knowledge. The advent of the knowledge era had a significant impact on all sectors of economy, especially the education sector (OECD, 1996). The world has been moving unintentionally towards the knowledge era. In a country, both organizations and individuals are engaged in knowledge creation processes. Today, the world economies are more dependent on knowledge (Economies, 2007). Therefore, the global trend has seen a shift from making investments in tangible sectors (physical and monetary resources) to harnessing intangible resources that primarily include knowledge and intellect (Kunasz & Skrzypek, 2009; Borowy, 2009).

Today, countries are in conflict with each other when it comes to strengthening their knowledge-based economies through knowledge management in different sectors (Morck & Yeung, 2001). In the modern world of knowledge, an organization aware of the interaction between knowledge management and learning environment becomes influential in creating and upgrading successful learning operations with the use of various innovative learning conditions (Lytras, Naeve & Pouloudi, 2005; Sicilia & Lytras, 2005; Naeve, Sicilia & Lytras, 2008; Ordóñez de Pablos & Lytras, 2008). As stated by Grace and Butler (2005), Rego, Moreira, Garcia & Morales (2009), Chatti, Jarke & Frosch-Wilke (2005), Zuboff (1988) in their respective research studies, learning, unification, and exchanging information and ideas are the appropriate tools applied in organizations to take advantage of employees' knowledge. Learning in a work-environment, no matter whether it takes place in a formal setting or an informal one, is derived from different knowledge management models. Every learning organization needs to follow a scientific process for learning and knowledge management. Such scientific processes include double-loop learning (Schön & Agyris, 1996; Argyris, 1976a, 1977b, 2002c), knowledge

creation theory for knowledge management (Nonaka, 1994; Nonaka & Takeuchi, 1995), and opaque leadership with socialization (Nonaka, Takeuchi & Umemoto, 1996) – all are used to promote knowledge activities in organizations (Nonaka & Toyama, 2015). Agyris (1977) has introduced a reframing theory called double-loop learning that promotes adaptive ideas for modification in environmental quality and thus enhancing organizational performance.

Another appropriate model which deals with tacit knowledge and explicit knowledge is called Spiral Theory and it was presented by Nonaka and collaborators (Nonaka & Takeuchi, 1995; Nonaka & Toyama, 2015). According to it, knowledge is complicated in nature, and every organization has its own knowledge assets (Erickson, & Rothberg, 2015). There are two types of knowledge that can be used for overall organizational learning; they are explicit and tacit (Nonaka, Byosiere, Borucki, & Konno, 1994).

The explicit (expressed) knowledge is in the form of documentation like books, audios, videos etc. which can be accessed and managed with little effort (Wikipedia, 2018). In other words, the knowledge recorded in the form of words with convenient availability is called explicit knowledge.

On the other hand, the tacit knowledge is neither accessible nor manageable with ease because it is related to a person's skills, insights and experiences (Wikipedia, 2018; Goffin & Koners, (2011). It can be said that the knowledge that does not have concrete form and is generally traced in people's skills and intelligence is called tacit knowledge.

According to Nonaka, knowledge creation is a "continuous transfer, combination, and conversion of the different types of knowledge as users practice, interact and learn." The inculcation of the latest knowledge into the existing knowledge assets of an organization is called the creation of knowledge that is based upon the research and development (R & D) through explicit and tacit knowledge techniques (Alavi & Leidner, 2001). Guthrie (2001) recommended the knowledge creation using intangible assets has now become a main cause of success and profit gaining source for successful organizations. Knowledge creation is a tool of knowledge management (Kaba & Ramaiah, 2017) that helps imparting the latest and fresh knowledge by using explicit (documentation) and tacit (human) knowledge. The creation of knowledge is based on four cyclic steps, as proposed by Nonaka and Takeuchi (1995). These steps include sharing and networking; writing and distributing the knowledge; comparing knowledge with others; and

integrating knowledge. These four steps are called SECI (Socialization, Externalization, Combination, and Internalization) model. The SECI model was initially developed by Nonaka (1991) and further modified by Nonaka and Takeuchi (1995) which adds further information to the spiral model of knowledge creation. The knowledge creation process as formulated by Nonaka, Takeuchi & Umemoto (1996) is based on the following combination of four practices:

1. Socialization: The conversion of knowledge in socialization is from tacit to tacit. It involves the transfer of knowledge through social involvement in the form of face-to-face interaction (informal discussion) with people or through experience sharing (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka et al, 1996) and opaque leadership activities within the organization (Nonaka, Toyama & Konno, 2000; Nonaka & Toyama, 2015; Xu, 2013).

2. Externalization: The knowledge conversion in externalization is from tacit to explicit. The tacit knowledge is expressed in explicit knowledge for creating and sharing paradigms and metaphors (Nonaka & Takeuchi, 1995; Nonaka & Toyama, 2015; Xu, 2013).

3. Combination: The conversion of knowledge under this practice is from explicit to explicit. Here explicit knowledge sources are synthesized into metadata (Nonaka & Takeuchi, 1995; Nonaka & Toyama, 2015; Xu, 2013).

4. Internalization: The conversion of knowledge in this practice occurs from explicit to tacit. Learning from reflection or learning by doing is called internalization (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka & Toyama, 2015; Xu, 2013).

The SECI model is widely approved particularly in the management sector because of its insightfulness and fine depiction of knowledge and its types (tacit and explicit), though the philosophical touch in the SECI model creates difficulties in the research field (Rice & Rice, 2005; Hosseini, 2011; Lee & Kelkar, 2013; Mani, Mubarak & Choo, 2014). Nonaka and Takeuchi examine the mechanisms and procedures that help in the formulation of knowledge. They contend that comprehension of organizational knowledge creation is essential for understanding knowledge creation. According to Nonaka and Takeuchi, epistemology and ontology are the two dimensions along which knowledge is created; ideas show epistemological dimension while social discussion shows ontological dimension. The previous researches on knowledge creation dealt with only epistemological dimension. However, the knowledge

creation at different levels of organizational entities is the central focus of ontology. These levels consist of individuals, groups, organizations, and inter-organizational connections as per Takeuchi and Nonaka's view. In this way, the process of creating knowledge and meaning is more of a collective endeavor than the result of an individual's efforts. This point of view is predicated on the "critical assumption that knowledge is formed and developed through social interaction between tacit knowledge and explicit knowledge" (Nonaka and Takeuchi 1998). Individuals produce and possess knowledge but the difficulty arises in motivating people in a group to share their tacit knowledge. This is referred to as the knowledge spiral. The spiral theory of knowledge creation starts from sharing of ideas; therefore, the theory is based upon idealism. According to idealism, reality is spiritual or mental and unchanging; and knowing is the rethinking of latent (inactive) ideas. The cognitive processes in an organization are described in the SECI model which considers knowledge as an entity that brings about changes in a chained form regularly and constantly and is affected by organization and individuals.

The educational institutions are also affected from knowledge creation practices (Bereiter 2002; Hargreaves 1999; Harris 2008) because education serves as the main instrument that develops a country in the long run through knowledge creation practices of educators. A strong education system in a country prepares a better human capital that ensures the progress of the country, and it only happens when teachers of educational institutions, especially higher education institutions, are involved in knowledge creations activities (R & D and innovation) and prepare students for current and future challenges (Trilling & Fadel, 2012). Human resource management primarily focuses on preparing skilled and trained people for different jobs available in the country. Knowledge has recently become the world's most important aspect of human as well as economic growth and development. In any economy, higher education institutions serve as the main hub of knowledge distribution. The Higher Education Commission in Pakistan, responsible for the promotion of tertiary education and alignment of higher education with the international trends, has introduced the system of "quality assurance" to ensure quality education system at universities and to exclude maximum errors and mistakes from the system. In line with the standards of quality assurance designed by the Higher Education Commission, universities in Pakistan are investing in the improvement of physical infrastructure and intellectual human development. An internal ranking system of universities

has also come into existence to with an aim to compete with international universities. Still the ranking of Pakistan in Human Capital Index (HCI) and Knowledge Economy Index is hovering around the lowest-ranking nations among a total of 138 countries (World Bank, 2018). The knowledge index makes assessment of the knowledge performance of a country by drawing a comparison with other countries in seven selected areas. According to the United Nations Development and Planning (UNDP), knowledge is often limited to education and technology but it is a vast concept and connected to the knowledge economy and knowledge society.

1. The knowledge index ranks Pakistan at 115 in the Global knowledge index.
a. In the first area of pre-university Education, Pakistan ranks at 101 out of 138 countries.
b. In the second area which deals with Technical and Vocational Education and Training, the rank of Pakistan is 106 across the globe.
c. The third area is about Higher Education; Pakistan is ranked at 95.
d. In the fourth area namely Research, Development, and Innovation, the rank of Pakistan is 89.
e. The fifth area is called Information and Communications Technology; the rank of Pakistan is 113 among 138 countries.
f. In the sixth area of Economy, the rank of Pakistan is 113 around the globe.
g. The seventh area is called General Enabling Environment; the rank of Pakistan is 126 among 138 countries around the world.

   (Knowledge for all, 2018)
2. The Human Development Index shows that the rank of Pakistan is 154 across the globe.

(United Nation Development and Planning, 2018)

Yeh, Yeh & Chen (2012) and Ho, Hseish & Hung (2012) stated that knowledge management has not been useful for managers and administration but meanwhile that knowledge management somehow is useful for teachers as the teachers learn to work in a collaborative environment. They thought that the knowledge creation SECI model is beneficial for teachers' professional and personal development. The educationists and policymakers largely value the knowledge creation practices in educational institutions for human development in the economy (Jaleel & Verghis, 2015; Hargreaves, 1999; Tan, So & Yeo (Eds.). 2014).

The old methods of knowledge creation have now been shifted into innovation, R & D, and digital literacy for organizational well-being as well as the development of educators and

individuals. (Anderson 2008). The practices, abilities, and competency of educators need to contribute to the achievement of the social well-being of people so that they know their civic duties and rights and engage in politics (Zinnbauer 2007; Osimo, Zinnbauer & Bianchi, 2007). In short, knowledge creation practices in educational institutions are not only beneficial for the organizations and economies but also for the existence of a better society.

1.2 Rationale of the Study

The world is growing day by day in the field of knowledge. In the 21st century, the world economies are more focused on making investments in human capital instead of physical capital because the former not only stores knowledge for a long time but also keeps modifying ideas through multiple activities and skills. Therefore, knowledge creation practices are very important because they guarantee competitive advantage in efficient organizational members who continuously remain engaged in creating knowledge through knowledge creation practices.

Since today's economies stand on knowledge-based resources, it's very important to conduct a research study on how knowledge is created and what practices we need to create knowledge. The knowledge creation processes in organizational assets are based on tacit and explicit forms of knowledge, and the conversion of tacit and explicit knowledge comes with practices which include socialization, externalization, combination, and internalization. These practices are based on the Nonaka's Spiral theory of knowledge creation. The knowledge creation practices encourage individuals to share their ideas and knowledge with others. It starts with individuals and leads towards collective knowledge creation in an organization.

Research studies on the performance of educational organizations with respect to knowledge creation based on the Spiral Theory of Knowledge Creation are quite rare internationally. In Pakistan, no research study has yet been conducted on knowledge creation practices in an educational institution especially at higher education level. The current study explores the knowledge practices applied by teachers using both tacit and explicit knowledge. The sharing of knowledge capabilities of teachers enhances the knowledge creation of an organization with a sequential process of practice.

In organizations, knowledge exists in both tacit and explicit forms. While explicit knowledge is found in written formats, tacit knowledge exists in an individual's mind. This is the knowledge that an individual gains from personal experiences and exposure to certain skills.

Therefore, organizations need to find out a way to harness the potential of tacit knowledge of their employees by providing them with an environment conducive for sharing and transferring of knowledge/ideas. Similarly, the function of universities is not limited to teaching practices happening in a classroom, but it also involves the processes that help promote knowledge creation.

Tacit knowledge is difficult to detect and mostly remains unobserved in traditional knowledge management systems. Therefore, Irick (2007) has emphasized that the interplay of tacit and explicit knowledge is a critical factor in an organization's knowledge management system. Effective knowledge management system requires the management of an organization to not only understand and capture explicit knowledge but to also promote the sharing of tacit knowledge through discussion and exchange of personal experiences.

This study aims to explore how knowledge creation systems enhance access to and sharing of tacit/explicit knowledge, and how Nonaka's theory affects the conversion of tacit and explicit knowledge.

Quite rarely can we find the application of the theory of knowledge creation or a research study on the knowledge creation practices in Higher Educational Institutions. A knowledge creation practice analyzes teachers' capabilities of managing knowledge strategically. Generally, the explicit knowledge used by teachers to express their knowledge is used as a source of knowledge creation. However, knowledge creation takes place with the structure of strategic management because knowledge creation involves systematical and sequential form so the abilities to manage knowledge strategically with core abilities are used to assess in university teachers by using the instrument of Nonaka theory.

Table 1.1

Previous Studies about Nonaka Spiral Model

Title	Researchers	Gaps/differences	Similarities	National/International
The Applicability of the SECI Model to Multiorganisational Endeavours: An Integrative Review	Rice & Rice, 2005	• Investigation of literature	• SECI model	International
The application of SECI model as a framework of knowledge creation in virtual learning	Hosseini, 2011	• Qualitative research methodology • Semi-structured interviews • Respondents: Professional facilitators	• Area: Education sector • SECI Model	International
Knowledge management and the SECI model: A study of innovation in the Egyptian banking sector	Easa, 2012	• Banking sector • Mixed method research	• SECI model	International
Knowledge creation in universities and some related factors	Siadat, Haveida, Abbaszadeh & Moghtadaie, 2012		• Education sector • Universities • Faculty members • Quantitative research	International

Title	Researchers	Gaps/differences	Similarities	National/International
Knowledge creation and conversion in military organizations: How the SECI model is applied within armed forces	Lis, 2014	• Area: military organizations	• SECI model	International
Knowledge sharing in academia: A case study using a SECI model approach	Faith & Seeam, 2018	• Students	• Quantitative research • Staff/Faculty • SECI model	International
Knowledge-Centered Culture and Knowledge-Oriented Leadership as the Key Enablers of Knowledge Creation Process: A Study of Corporate Sector in Pakistan	Ayub, Hassan, Hassan & Laghari, 2016	• Cooperate sector	• Quantitative	National
Employee Involvement and the Knowledge Creation Process: An Empirical Study of Pakistani Banks	Bashir Memon, Syed & Arain, 2017	• Banking sector • Bank employees	• Quantitative • SECI model	National
The Impact of Knowledge Management Environment on Knowledge Management Effectiveness: Through Mediating Role of Knowledge Sharing Process in Branch Banking of Pakistan	Imran, Shafique, Sarwar & Jamal, 2021	• Banking Sector	• Quantitative	National

For researchers, knowledge is a favorite area because of the changing international trend marked by the transition from physical resources to knowledge resources. Internationally, many researchers study about knowledge creation in different sectors. Hosseini, 2011 conducted a research on knowledge creation by using Spiral knowledge creation theory, and used a

qualitative research approach and semi-structured interviews for data collection from professional facilitators of the education sector. Travaille & Henriks, 2010 also researched on education sector by using the Nonaka Spiral theory of Knowledge creation to check out the success factor of knowledge creation in universities. The researchers used a qualitative approach along with stratified sampling technique. They also used interviews as a research instrument to get feedback from researchers, technicians and leaders of the research institutes of different universities.

Siadat, Haveida, Abbaszadeh & Moghtadaie, 2012 conducted a research study on knowledge creation using Nonaka's spiral theory of knowledge creation at the university level. Using quantitative approach, they gathered data from the faculty members of universities through a questionnaire. Faith's & Seeam's, 2018 research on knowledge sharing in academia involves both students and teaching faculty as the respondents. They have also used a quantitative approach and applied Nonaka's spiral theory of knowledge creation.

As mentioned earlier, knowledge creation is not limited to education sector only; therefore, many researchers studied knowledge creation practices in sectors other than education. While using Nonaka's knowledge creation theory, Lis, 2014 studied knowledge creation and its conversion in military organizations. Rice & Rice, 2005 studies knowledge creation with the multi-organizational investigation through literature by using Nonaka's Knowledge creation theory. Bandera, Keshtkar, Bartolacci, Neerudu & Passerni, 2017 took small and medium entrepreneurial firms Easa, 2012 carried the banking sector and in both research mixed-method approach has been used.

In the Pakistani context, work on knowledge creation is limited in all aspects. A few researchers who have studied knowledge creation did their work in selected sectors, and all of them have used quantitative approach for their studies. Bashir Memon, Syed & Arain, 2017 took the banking sector and Abbas, Rasheed, Habiba & Shahzad, 2013 chose the banking sector while Ayub, Hassan, Hassan & Laghari, 2016 focused on cooperate sector.

To sum up, knowledge creation is an important area of research for today's researchers as it serves as one of the most important entities for both individuals and organizations for their survival and development. With the help of Nonaka's knowledge creation theory, the researchers can do their research work in all sectors and use different research methods and approaches. In

Pakistan, only a few researchers have done their work in a few selected sectors, and majority of them studied the knowledge creation processes in their selected domains.

1.3 Statement of the Problem

The knowledge-based economies have a strong system of higher education. Universities of a country produce human capital equipped with sound knowledge. They prepare human capital with suitable skills, knowledge, and experience that eventually contribute in knowledge creation. The importance of knowledge creation has increased manifold because the world has been gradually moving from physical resources to knowledge resources. According to the facts mentioned in the introduction part, Pakistan's ranking is quite low on the knowledge index. Therefore, the current study has been designed to explore the knowledge-creation practices among university teachers with an aim to explore the best practices that are needed to be employed in universities. The study has compared three bars of strata i.e. sector-wise, faculty-wise and gender-wise. The comparison is based on similarities and differences. Public and private universities have been compared because the Government of Pakistan provides regular funding to the public universities but the private universities generate their own funds or receive donations from local bodies. Thus the status of public universities becomes a little higher in terms of their performance. The Natural Sciences and social sciences are different because the former is concerned with nature while the latter is related to human beings and their society. The study aims to explore the knowledge-creation practices of university teachers.

1.4 Objectives of the Study

1. To explore the status of knowledge creation practices (SECI) of University teachers.

2. To explore the sources of knowledge explicitness of University teachers.

3. To compare the knowledge creation practices (SECI) of Public and Private University teachers.

4. To compare the knowledge creation practices (SECI) of Faculty of Natural Sciences and Faculty of Social Sciences

5. To compare the knowledge creation practices (SECI) of Male and Female University teachers.

6. To compare the sources of knowledge explicitness of Public and Private University teachers.

7. To compare the sources of knowledge explicitness of Faculty of Natural Sciences and Faculty of Social Sciences.

8. To compare the sources of knowledge explicitness of Male and Female university Teachers.

1.5 Research Questions of the Study

This study has conducted to answer the following study questions:

1. To what extent the university teachers utilize the knowledge creation practices.

2. What sources of knowledge explicitness do the university teachers use more frequently?

3. To what extent are the Sector-wise (Public and Private), faculty-wise (Social Sciences and Natural Sciences), and Gender-wise (male and female) University teachers different from each other in using knowledge creation practices.

1.6 Hypotheses of the Study

$H0_1$: There is no difference between public and private university teachers in their knowledge creation practices

$H0_{1a}$: There is no difference between public and private university teachers in terms of internalization of knowledge creation practice.

$H0_{1b}$: There is no difference between public and private university teachers in terms of externalization of knowledge creation practice.

$H0_{1c}$: There is no difference between public and private university teachers in terms of socialization of knowledge creation practice.

$H0_{1d}$: There is no difference between public and private university teachers in terms of combination of knowledge creation practice.

$H0_2$: There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences in their knowledge creation practices

$H0_{2a}$: There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences in terms of internalization of knowledge creation practice.

H0$_{2b}$: There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences in terms of externalization of knowledge creation practice.

H0$_{2c}$: There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences in terms of socialization of knowledge creation practice.

H0$_{2d}$: There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences in terms of combination of knowledge creation practice.

H0$_3$: There is no difference between male and female university teachers in their knowledge creation practices

H0$_{3a}$: There is no difference between male and female university teachers in terms of internalization of knowledge creation practice.

H0$_{3b}$: There is no difference between male and female university teachers in terms of externalization of knowledge creation practice.

H0$_{3c}$: There is no difference between male and female university teachers in terms of socialization of knowledge creation practice.

H0$_{3d}$: There is no difference between male and female university teachers in terms of combination of knowledge creation practice.

H0$_4$: There is no difference between public and private university teachers when it comes to the use of knowledge explicitness sources.

H0$_5$: There is no difference between the Faculty of Natural Sciences and Faculty of Social Sciences in their use of the sources of knowledge (knowledge explicitness).

H0$_6$: There is no difference between male and female university teachers in their use of the sources of knowledge explicitness.

1.7 Theoretical Framework of the Study

The foundation of the study is Nonaka's (1995) knowledge spiral theory. The theory comprises a quadratic angle that includes four practices: socialization, externalization, combination and internalization. The basic idea of the spiral theory of knowledge is to strengthen organizational learning capacity with continuous linkage of tacit and explicit knowledge through

the above-mentioned four processes. These processes are perpetual with a spiral of knowledge (tacit and explicit) and result in creation of innovative knowledge.

The reason behind selecting the Nonaka Spiral theory is that it is not only focusing on individual learning but also focusing on groups and organizations. The theory is organizational learning therefore the focus is on three tiers (individual, groups, and organization) through share and combine the knowledge. In short, knowledge creation is the collective learning of an organization. According to Huang & Wang, 2002 the most research studies and works on knowledge creation and creativity have been on individual level and this theory introduce the continuous knowledge conversion abilities collectively (individual to organizational level).

TACIT   TACIT

KNOW HOW THROUGH SHARED EXPERIENCE Socialization • Individual works tandem with the colleague • Individuals share their experience in informal occasions	**PUTTING INTO WORDS, PATTERNS AND MODELS** Externalization • Group outlines experience • Tools: ○ Expert interviews ○ Lesson learned ○ Ideation workshops
SHARING OF ORGANIZATION'S KNOWLEDGE Internalization • Individual learns by working according to instructions and other documents	**LINKING OF NEW KNOWLEDGE TO OLD** Combination • Organization converts knowledge to formal form ○ Instructions ○ Databases ○ specifications

TACIT (left vertical)   EXPLICIT (right vertical)

EXPLICIT   EXPLICIT

Figure 1.1. Practices and Cyclic Process of Nonaka's Knowledge Creation Theory, 1995

The SECI model is widely approved particularly in the management sector because of insightfulness and fine depiction of knowledge and its types (tacit and explicit), though the philosophical touch in the SECI model creates difficulties in research (Rice & Rice, 2005;

Hosseini, 2011; Lee & Kelkar, 2013; Mani, Mubarak & Choo, 2014). The cognitive processes in an organization are described in the SECI model. SECI model addresses the knowledge as an entity that changes in a chained form regularly and constantly and is affected by both organizations and individuals.

The clear practices in the industrial period can now be transferred. The old method of knowledge creation practices is now shifted into innovation, R & D, and digital literacy for organizational well-being and development of educators and individuals. (Anderson 2008). These practices, abilities, and proficiency of educators are necessary to achieve the social well-being of people, and the individuals can know their civic duties and rights and engage in politics (Zinnbauer 2007; Osimo, Zinnbauer & Bianchi, 2007). In short, knowledge creation in educational institutions is not only beneficial for organizations and economies but also for the betterment of society at large.

1.8 Operational Definitions of Each Construct

1. **Knowledge Creation:** Knowledge creation is the "continuous transfer, combination and conversion of different types of knowledge, as users practice, interact, and learn." Knowledge creation is the practice of creating knowledge from an individual level to the collective state.

2. **Knowledge Creation Practices:** Knowledge creation practices are knowledge-creating activities including socialization, externalization, combination, and internalization. These practices make knowledge creation process continuous. Each practice of the knowledge creation process spirals from tacit to explicit knowledge.

3. **Tacit Knowledge:** Tacit knowledge is the knowledge gained through an individual's personal experience (skills and abilities) which is difficult to express. In other words, tacit knowledge is the personal knowledge embedded in an individual.

4. **Explicit Knowledge:** Explicit knowledge is in form of documentation like books, audios, videos, etc which are accessible and manageable with little effort.

5. **Sources of Explicitness:** Explicitness sources are the sources of knowledge or information that provide clarity to knowledge. Sources of explicitness refer to the sources that are used to enhance the existing knowledge.

6. **Status:** Status is the condition or situation of something at a specific time.

7. **Socialization:** Socialization is sharing of knowledge through different channels including discussion, group projects, meetings etc. It also involves transfer of knowledge through social involvement in the form of face-to-face interaction in informal settings (Nonaka, 1994).

8. **Externalization:** Externalization is collaborative knowledge where abstraction comes in form of verbalization. Tacit knowledge express into explicit knowledge for creating and sharing paradigm and metaphor (Nonaka, 1994)

9. **Internalization:** Learning from reflection or learning by doing is called internalization.

10. **Combination:** Combination is making available knowledge clearer and more favorable by rewording it. It includes synthesizing explicit knowledge sources into metadata (Nonaka, 1994).

1.9 Scope and Delimitation of the Study

The study has been conducted to explore the knowledge creation practices of university teachers. For this purpose, Nonaka's theory of knowledge creation has been used. Knowledge creation is a process which involves four practices used at individual and collective levels.

In view of financial constraints and time limitation, the study has been delimited to:
- Rawalpindi/Islamabad
- Faculty of Natural Sciences and faculty of social science
- Nonaka's Spiral Theory of Knowledge Creation

Globally, the industrial period has now shifted to the knowledge economies in which learning organizations play a vital role. Countries are making more investments in knowledge to increase their human capital as human capital stays longer than physical capital. In this regard, universities play an important role as learning organizations. Knowledge creation practices create a great impact on teachers' personal and professional development. According to Nonaka, knowledge creation is the "continuous transfer, combination, and conversion of the different types of knowledge as users practice, interact, and learn." The purpose of this study is to explore the information related to knowledge creation practices and its sources prevalent in selected universities of Rawalpindi and Islamabad. The objectives of the study are to: (1) explore the

status of knowledge creation practices (SECI) of university teachers (2) explore the sources of explicitness of university teachers (3) compare the knowledge creation practices (SECI) of public and private university teachers (4) compare the knowledge creation practices (SECI) of Faculty of Natural Sciences and Social Sciences (5) compare the knowledge creation practices (SECI) of male and female university teachers (6) compare the sources of explicitness of public and private university teachers (7) compare the sources of explicitness of Natural Sciences and Social Sciences university faculties (8) compare the sources of explicitness of male and female university teachers.

1.10 Significance of the Study

This research study may help educational organizations in using different knowledge creation practices for explicit and tacit knowledge by using different dimensions of Nonaka's theory including socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit), and internalization (explicit to tacit). The study will help the university administration and teachers to enhance their knowledge creation practices through explicit and tacit knowledge. The study may help organizations in harnessing both tacit and explicit knowledge for the benefit of their employees and organizations at large.

Globally, the industrial period has now shifted to the knowledge economies in which learning organizations play a vital role. Countries are making more investments in knowledge to increase their human capital as human capital stays longer than physical capital. Universities play an important role as learning organizations and university teachers are the central part of universities. Knowledge creation practices create a great impact on teachers' personal and professional development. This study will guide the policymakers to make policies according to knowledge creation practices. It is equally important for trainers to train teachers according to the effective knowledge creation practices.

According to the OECD, 1996 research, flourished organizations are rich in knowledge and intellectual property. Therefore, the developed countries especially OECD countries focus on knowledge creation practices and believe that knowledge creation and sharing contribute to the development in the modern era. The current research study will be beneficial for human resource management organizations to organize human resource development trainings.

1.11 Research methodology

The quantitative research approach and descriptive survey method have been used for this research.

Approach

The study is rooted in deductive reasoning; therefore, quantitative approach has been used for the study.

Design

Cross-sectional study design has been employed in the study, and descriptive survey research method has been used.

Population

Faculty of Natural Sciences and Faculty of Social Sciences from both public and private universities of Rawalpindi and Islamabad are the population of the study. A total of 4195 teachers from the Faculty of Natural and Faulty of Social Sciences were covered under this study.

Sampling

Stratified sampling technique has been used for selecting the sample. Strata were made on the basis of public and private universities. Male and female respondents, and Faculty of Natural Sciences and Faculty of Social Sciences were sub-stratas.

Research instrument

The study is quantitative in nature and data has been collected through questionnaire. Standardized scales were used for the research study with the permission of developers. The first section is related to demographic information; the second deals with knowledge creation; and the third is about the sources of knowledge explicitness.

1.12 Structure of Thesis

Chapter 1 focuses on the review of knowledge creation practices. The chapter mainly gives an overview of the background of the study, rationale of the study, the problem statement of the study, research objectives, research questions, theoretical background of the study,

definitions of the constructs, delimitation of the study, and significance of the study. This chapter gives an overall picture of the study.

Chapter 2 focuses on the brief description of the knowledge creation with the help of different studies. This chapter shows that the knowledge needs to renew every day as it depreciates like physical assets. Therefore, knowledge creations practices are important for any organization to keep updating the knowledge resources.

Chapter 3 provides a complete insight into the research method and methodology. The chapter covers the selected research approach, design, and method. In this chapter, the population and sample are also discussed with all instruments of the study. The standardized questionnaires used in this study have also been mentioned along with the name of their developers. Pilot testing has been conducted because of cultural differences, and prior to pilot testing, the questionnaire was briefly reviewed by three experts. With their permission, the questionnaire was used for pilot testing and data collection. Data collection and data analysis are also parts of this chapter. More information is includes about the process of data collection, the number of responses received from respondents, and the tests used in this study for data analysis.

Chapter 4 contains data examination and subsequent interpretation of the results. Each objective has been presented separately in this chapter and the descriptive statistic, independent t-test was applied on all the data to find out the results according to the objectives.

Chapter 5 includes the summary of the entire research study including findings, discussion, conclusion, limitations, recommendations, and future recommendations. The outcomes of research study have been comprehensively discussed in this chapter.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 Introduction

Learning and knowledge are important parts of our lives. Learning is a general term while knowledge has specific qualities. We keep learning every moment but knowledge is a process of implementing what we learn.

1. Learning → General

2. Knowledge → Specific

Today's researches in universities are concerned about knowledge economy (Dickens, House & Storey, 1965; Dickens, 2012) more than the past researchers who did not explore about knowledge being an essential component of educational organizations (Ben-David & Zloczower, 1962).

Now have literature discussing how knowledge revitalizes the economy and organizations with the help of innovation and new ideas. Learning and knowledge make human recourse more productive in an economy or organization. Thus the importance of knowledge calls for investing in knowledge and education to boost up the economy and organizational strength for a long time in a country.

The available literature talks about organizational theory, role of management in educational institutions, learning organization and organizational learning, resource based view of organization and knowledge management. The practice of knowledge creation is to strengthen the existing body of knowledge and add more to it through research and development carried out by individuals (Bollinger & Smith, 2001). Besides, this process makes knowledge more transparent and connects it with the knowledge system of organizations. The knowledge and experience of individuals gained in their work-life is useful for the welfare of colleagues and organization (Senge, 1990; Perrons, D. 2003; Cappelli, 2008).

2.2 Knowledge (A Complete History)

The idea of spending resources on increasing human knowledge is given by Adam Smith who had a significant contribution to the creation of knowledge useful for economic growth and development (Smith, 1937, 2010; Shaikh & Tonak, 1996). He had great insight and analytical thinking that enlightened academic practices (Buckley, 2014). Further, Smith clearly explains that knowledge and skills are not only increased by effective deployment but also through brushing up in the specific area. Kenny, 1989; Kremer, 2017 stated in their studies on Gilbert Ryle's, 1949 research that knowledge-that (tacit knowledge) mostly relies upon knowledge-how (explicit knowledge). Intelligence (tacit knowledge) changes in performance through action (explicit knowledge).

Gilbert Ryle presented two distinct types of knowledge. The first one is "knowledge-that" and the second one is "knowledge-how". Knowledge-how (tacit knowledge) is different from knowledge-that (explicit knowledge). Tacit knowledge comes from experience but is not explained well. Tacit knowledge is related to intelligence and actions are related to the explicit knowledge. Actions always need some experiential knowledge behind them.

Friedrich (Hayek, 1937; Hayek, 1945; Hayek, 1989) highlights that knowledge-based economy is the formation and sharing of knowledge and information through infrastructure and organizations for the development of productivity within countries and organizations to increase economic growth.

2.2.1 Idea, innovation and human capital

Schumpeterian (1911, 1912) said that learning something new is called innovation. The ideas of Schumpeterian regarding innovation are followed by Galbraith, Goodwin, and Hirschman which are in turn based on economic dynamics (Scherer, 1988; Galbraith, 1973, 1977, 1978; Goodwin, 1990; Goodwin & Punzo, 2019; Punzo, 2006; Hirschman, 1958; Hirschman & Lindblom, 1962). Rogers (1962) said that the idea received by human resources is called innovation. Couros, 2015 said that good ideas come from the way of thinking. According to Dorenbosch, Engen & Verhagen, 2005; Gupta & Singhal, 1993; Gupta, 1993 human capital is generated through professional and personal activities in an organization that helps in behavioral activities i.e., problem acknowledgment and idea creation and idea screening (Toubia & Florès,

2007; Schulze, Indulska, Geiger & Korthaus, 2012; Luo & Toubia, 2015; Hammedi, van Riel & Sasovova, 2011; Van Riel, Semeijn, Hammedi & Henseler, 2011).

Following is the detail on behavioral activities:

1. Acknowledgment of a problem: Hunches about the issue in an organization that leads towards its solution (Ellis & Levy, 2008, 2009; Greiner, 1989; Greiner & Bhambri, 1989; Schenk & Guittard, 2011).

2. Idea creation: Generates a list of ideas that are used for targeted and specific solutions. Here the crux of an idea is selected (Heinonen, J., Hytti, U., & Stenholm, P. 2011; Matlay, 2011; Tschang & Szczypula, 2006; Witell, Kristensson, Gustafsson & Löfgren, 2011; Su, 2009).

3. Idea screening: Idea screening is about relevance of an idea for a particular organization. It checks whether an idea is competitive, profitable (return on investment), productive (in a progressive way), and based on world trend (market demand) (Onarheim & Christensen, 2012; Magnusson, Netz & Wästlund, 2014; Magnusson, Wästlund & Netz, 2016; Kamp & Koen, 2009; Hammedi, van Riel & Sasovova, 2011; Toubia & Florès, 2007).

   Romer, 1986, 1994, 1988; Grossman & Helpman, 1994 are economists who worked on the long-term economic growth and development by developing new theories and ideas (innovations) with the help of investment on human capital (Arrow, 1962; Romer, 1986; Grossman & Helpman, 1994) along with the use of physical capital (Lucas, 1988, Romer 1986; Grossman & Helpman, 1994) to mutually accelerate the organizational production and performance and to provide support in a competitive environment (Grossman & Helpman, 1994). The luxurious lifestyle in societies is dependent on the advancement of technology which is possible only with the help of great ideas and their implementation (Schumpeter, 1934; Solow, 1970; Schumpeter & Redvers, 1934). The neoclassical production function explains that the diminishing in return added more capital in an economy, an effect which may be offset, however, by the flow of new technology (Solow, 1956; Samuelson & Solow, 1956; Grossman & Helpman, 1994). The growth of an economy occurs when innovations and new technologies are introduced and the economy follows the current trend of the world to compete with other economies (Pack & Westphal, 1986; Evenson & Westphal, 1995; Pack & Nelson, 1999). The economies based on knowledge can enhance their returns of investment (Pack & Nelson, 1999; Knight, 1944). A country which relies on human capital (knowledge) works more effectively, and the innovations

and technologies lead to improvement of products and services (Becker, 1962; Schultz, 1961). After that there is much possibility for long-term growth and foreign direct investment (Pack & Nelson, 1999; Knight, 1944; Solow, 1970; Solow, 1956; and Becker, 1962). The ideas based on knowledge used by different firms, organizations, and institutions of a country produce better outcomes and cause little cost (Cass, 1956; Solow, 1970; Solow, 1956; and Pack & Westphal, 1986).

2.2.2 Investment in knowledge through education

Saxton, 2000; Blundell, Dearden, Meghir, & Sianesi, 1999 said that investments in education and training, research and development, and the structure of organizations helps develop new technologies (Goldin & Katz, 2009) that improve the productivity of resources. Researches on economic growth gave an idea in the 20th century human resource is the factor responsible for production, and therefore, the rate of return on education and training should not be reduced (Abramowitz, 1989; Urquhart, 1990). Spending on knowledge and skills leads to an increased return (Katz, 1999a, 1999b; Oblinger & Katz, 1999). These conclusions suggest a changed view from the neo-classical model which preferred the use of physical resources of production to human resources (Grossman & Helpman, 1994). The integration of knowledge in normal economic production functions is not a simple job as some kind of knowledge is reproduced and spreads easily at a low cost, but some kinds of knowledge cannot be easily transferred without establishing proper linkages with networks and requiring spending in significant amount, and transformation of codification into information (Fisher, Dwyer & Yocam, 1996; Selwyn, 2011, 2016; Fisher & Dwyer, 1996 and De Ferranti, et al. 2003).

Through different phases of human civilization, attention towards information and knowledge has been on the rise. According to Herbert Simon (1999), the description of knowledge has been transferred from memorization of knowledge to using information in an appropriate manner to get something productive from it. We all do talk about knowledge. There are several stages of knowledge that lead us to know better what knowledge is. Epistemologists considered these the following possible kinds of knowledge.

1. Knowing by acquaintance: It refers to both direct association with a person or thing (personal experience by the use of one's own sense) and indirect experience that makes a description in mind about a particular person or a thing (Fang & Brower, 1959).

Jakobson, 1959 said, "no one can understand the word "cheese' unless he has a nonlinguistic acquaintance with cheese."

2. Knowing THAT: The knowledge about the facts and truths is called knowledge that e.g., the knowledge that 2x 2 = 4; or the knowledge that water is colorless. Facts and truths cannot not be changed in any circumstances. (Fantl, 2008; Sosa, Kim, Fantl & McGrath, 2008; Cohen & Squire, 1980; Ryle, 1945; Snowdon, 2004).

3. Knowing WH: Knowing-wh offers a wide-range of thinking procedures to communicate and think. As per epistemic acceptance it would be like, "if it were true, I would know it" (De Cornulier, 1988).

a. Knowledge WHETHER: Knowing whether an opinion or judgment is true or false e.g., whether is it good to go on vacation. (Hart, Heifetz & Samet, 1996; Fan, Wang & Van Ditmarsch, 2015; Aloni, Égré, & De Jager, 2013 and Schaffer, 2007; Sliwa, 2015)

b. Knowledge WHO: e.g., who is going to vacation (De Cornulier, 1988; Sliwa, 2015).

c. Knowledge WHY: It explains why an activity is important (Lee & Strong, 2003; Koole, Webb & Sheeran, 2015; Sliwa, P. 2015). e.g., why vacations are necessary.

d. Knowledge WHAT: Knowing what are the purposes of an activity or action (Pfeffer & Sutton, 1999; Sliwa, P. 2015) e.g., What do people do on vacations?

e. Knowledge HOW: How an action or activity can be effective (Sliwa, P. 2015; Cohen & Squire, 1980; Stanley, J., & Willlamson, T. 2001; Ryle, G. 1945). e.g., how do vacations affect people's lives?

These questions require answers for proper knowledge.

4. Knowing HOW: The next level is to shift from the knowledge-that to knowing-how. Knowledge-how is the implementation of knowledge-that we already know. Taking the previous example of vacation, we know whether who, why, what, how but whether we know how to apply this information in practical knowledge (Gilbert Ryle, 1971, 1946; Bengson & Moffett, 2007).

2.2.3 Competitiveness and knowledge creation

In this competitive, dynamic, and complex environment, learning organizations need to be more effective in the knowledge creation and transformation process. According to Ichijo & Nonka, 2006, 2007; Murmann, 2003; Murmann, Aldrich, Levinthal & Winter, 2003; Stephan, Murmann, Boeker, & Goodstein, 2003; and Tallman, Jenkins, Henry & Pinch, 2004, the twenty-first century organizational members can extend their intellectual capabilities through the creation of new knowledge. The sustainability and success of any organization depends upon intellectual capital that is the part of knowledge creation by transferring and interpreting it (Sher & Lee, 2004; Rastogi, 2000a, 2000b; Kakabadse, A., Kakabadse. N. K., & Kouzmin, 2003; Choo & Bontis, 2002; Bontis, 2002 and Wiig, K. M. 1997).

Therefore many studies based on knowledge creation and transformation primarily focused on the origination and quality of knowledge (Alavi & leidner, 2001a, 2001b; Muller & Zenker, 2001) but they did not pay much attention to the development of knowledge culture within an organization. There are many categories of means and methods that create the possibility of knowledge creation and transfer process within an organization; nevertheless, there is no significant research on learning organizations as an approach to promote learning and to facilitate knowledge management, and how they can play their role in knowledge creation and transmission (Weldy, 2009). Leaning organizations comprise the establishment of a structure to comprehend and share knowledge (Del Rosso, 2009; Wang & Noe, 2010; Marsick & Watkins, 2003; Watkins & Marsicks, 1993). As a result, learning organizations are very helpful for progress and gross root development in the competitive environment.

The correct description of knowledge is a little complicated. Recognition of the concept of knowledge creation and transmission is fundamental before debating on it as employees most of the time remain unsuccessful in acquiring fresh and new knowledge due to the mistakes of the very concept. The recognition of data, information and knowledge must be necessary for better understanding. In general, a raw fact which is yet to be analyzed is called data; the data that is analyzed and organized is called information; and the information having proper purpose or meaning is called knowledge (Bhatt, 2001; Yahya & Goh, 2002; Mason & Pauleen, 2003). According to Davenport & Prusak 2000; Lesser & Prusak, 2000 knowledge is derived from information, and information comes from data. Argyris & Schon, 1996 and Schön & Argyris,

1996 argued that "information is detailed in a form that links to the previous and the current chunks of information whereas the knowledge is extremely predictive that turn up through the forecast that based on prediction which comes in form of information." Boisot, 2002 stated that the first thing is to be clear about the fundamental meaning of knowledge. The most related concepts connected to knowledge are data and information, and these related concepts somehow make confusion. The precise and understandable differences between the three are given below.

Table 2.1

Difference between Data, Information and Knowledge

Data	Information	Knowledge
Data comes from the world. Data creates different perceptions. Only necessary perceptions are processed further (Boisot, 2002).	Information plays a middle role in between data and knowledge. When data is change into information, it modifies the agent's expectations in a particular way (Boisot, 2002).	Knowledge comes from agents. Specific related and up-to-date information carried out by agents is called knowledge (Boisot, 2002).

In other words, a small quantity of relevant data needs agents to transform it into information which in turn becomes knowledge when executed. Therefore, to convert data into knowledge, agents take data and pick up relevant information for specific use; the usage of this information is called knowledge.

Though the word knowledge is commonly used by people, the definition of knowledge is not as simple as we think. It is because of different knowledge taxonomies used in organizations. To develop an understanding about the definition of knowledge, we must differentiate different kinds of knowledge. They are informal, in the form of "soft and hard (Huber, 1991), proper (formal) and improper (Conklin, 1996), protected, unlocked, secret (personal), and common-sense (Boisot, 1995a, 1995b), tacit and explicit (Nonaka & Takeuchi, 1995), cognitive or conceptual knowledge, incarnate knowledge, deep-rooted knowledge, and encrypted knowledge (Blackler, 1995; Blackler, Crump & McDonald, 1998)". Varieties of definitions have been used by different scholars; however, the following description of knowledge is more precise and complete than others: "knowledge is established through cognition and skills that a person uses

to solve problems and for decision-making purposes. Knowledge involves ideas and practical implementation of ideas in line with certain rules and regulations. Knowledge is supported by data and information which progressively promote knowledge with individual perceptions. Data and information are based on facts and figures but knowledge is constructed by individuals by adding up their own belief and directing the way of practical implementation."(Probst, Raub, & Romhardt, 2000). The sequencing of ideas rules and regulation, processes, and information in mind and implement them practically is called knowledge (Marakas, 1999; Bhatt, 2000, 2001). The meaning of knowledge makes knowledge meaningful and updated otherwise proper sense or logic the knowledge is in stagnant form.

The world economy, strategic unions, investment systems, and entrance into the global market all confirm that knowledge creation and transformation are practically important in all learning organizations (Eliufoo, 2005). For improvement in organizational performance, competitive advantages, and gross root development, knowledge and utilization of knowledge are the main determinants of knowledge-based theory (Alavi & Leidner, 2001a, 2001b). The study of Eliufoo (2005) propounds that the vision of an organization continuously expands and it can achieve its organizational goals by using knowledge, which in turn helps yield competitive advantages as well. Today, the structure of most of the organizations is based on decentralization according to their needs; therefore, learning organizations must also be more focused on their needs and manage them accordingly to stay in the competitive environment. However, they have to work on capturing, creating, and transferring fresh and original knowledge which required for the organization.

Knowledge and knowledge creation have many conceptual components, as they two are constructs, in that case , they are theoretical variables that are 'invented to explain phenomena' (Schriesheim, Hinkin & Podsakoff, 1991; Schriesheim, Powers, Scandura, Gardiner & Lankau, 1993; Hinkin & Schriesheim, 2008; Yammarino, 1993). The main attention or interest in abstract theoretical variables is their construct validity. The judgment of constructs is as adequate and accurate as its purpose to measure and reflects the study objectives in its content (Nunnally & Bernstein, 1994). To estimate the content validity, the definitions and concepts of study must be clear and relevant and the meaning of each factor that is useful to measure the construct reflects the main topic that is representative in the content domain, and the content of the study presents its objectives (Carmines & Zeller, 1979).

Hence, the very first step for the study of knowledge and knowledge creation is to determine its content validity by reviewing its theoretical definitions that are helpful to specifying relevant content (Mitchell & Boyle, 2010; Chung & Yoon, 2015; Durst, Edvardsson & Bruns, 2013).

The discussion of the literature on knowledge and its creation is centered around continuing and inconsistent definitions and phenomena of knowledge that surrounded in research studies (Garavelli, Gorgoglione, & Scozzi, 2002; Gourlay, 2006a, 2006b; Kakihara & Sorensen, 2002; Pica & Kakihara, 2003) because most of the researches on knowledge creation based their studies upon abstract idea or concept of knowledge (Droge, Claycomb & Germain, 2003; Madhavan & Grover, 1998; Sarin & McDermott, 2003), while the discussion about the definition of knowledge creation and operationalization largely depends upon the investigative approaches (Bryant, 2005; McFadyen & Cannella Jr., 2004; Un, Cuervo-Cazurra & Asakawa, 2010; Un & Cuervo-Cazurra, 2004). This has not been debated or categorized together with conceptualization and methods (Droge et al., 2003; Madhavan & Grover, 1998; Sarin & McDermott, 2003). Not a single relevant research has come up with a concrete definition of knowledge creation (Droge et al., 2003; Kess & Haapasalo, 2002; Haapasalo & Kess, 2002; Lee & Cole, 2003; Madhavan & Grover, 1998; Matusik & Heeley, 2005; Smith, Collins, & Clark, 2005; Collins & Smith, 2006; Smith, 2005). The researcher who defines knowledge creation paves a way towards proper procedure and progress.

"The procedure of knowledge creation refers to the initiatives and actions undertaken towards the origination of new ideas or objects (Mitchell & Boyle, 2010)", for example, Styhre, Roth, Ingelgard, (2002); Ingelgard, Roth, Styhre, Shani, (2002) said that knowledge creation is the utilization of intricate and irregular situations that indirectly deal with problems and issues individually and collectively.

In terms of procedure, knowledge creation is described by Rebecca Ferguson, 2009, as a method or means due to which knowledge is created or produced to make difference at the end. Knowledge creation in from of outcome is the production or creation of fresh and original ideas which are used as input of existing ideas (Parent, Gallupe, Salisbury, Handelman, 2000; Parent & Gallupe, 2000).

The existing knowledge using which one can start a project and the knowledge required for the progress and success of that project is called knowledge creation (Johnsons, 2002; Analoui, Hannah Doloriert & Sambrook, 2012; Priss, 2002). "As an output, knowledge creation is defined in terms of an immediate product the knowledge creation process, such as the representation of an idea, and can be differentiated from its impact on the organizational system, or outcome" (Mitchell & Boyle, 2010). The fresh knowledge is dispersed, accepted, and surrounded by a new idea and opportunity in organizations: this is the outcome of knowledge creation (Argyris & Schon, 1996; Nonaka, 1994); for example, they take the ideas in and understand fully from the outside of the new set of laws and schedules (Phan, Lee & Lau, 2003; Jones, Chonko & Roberts, 2003; Poh-Kam, 2000). "Knowledge creation as an outcome is defined in terms of a value-adding object" Mitchell & Boyle, 2010. Further, Mitchell & Boyle thought that knowledge creation logically precedes knowledge creation outcomes, and this process leads towards the output of knowledge creation; the whole process is simply classified into three tiers. As a procedure, knowledge creation is a mirror of ideas and actions that start with the creation of knowledge outputs, new thoughts, and things. As an output, knowledge creation is the productive change in an individual's perception which is assessed as considerably unusual from existing knowledge that leads towards the conceptual base of knowledge creation outcomes. As an outcome, creation of value adding things includes schedules, goods, publications and services.

Knowledge is an intangible thing that needs physical things for its completion. In short knowledge is an idea that needs some concrete matter for its implementation and expression. Knowledge creation deals with explicit and tacit knowledge. Most of our knowledge has fundamental associations with its effect (things). Adam Smith said of the "skill, dexterity, and judgment" of labor that knowledge is also situated in hand as it is in the head of a skilled and experienced teacher use who uses teaching tools and methodologies to show the complete picture of his or her knowledge.

Stehr & Adolf, (2016, 2018) concluded in their research that some things in this world cannot be obtain by using power and money, and knowledge is such an entity. We can buy material things (house, clothes, lands, etc) by using money.

"An heir to an empire may be born, he may be the legal successor to thrones, armies, and navies; over these, he may exercise dominion and be their possessor, but no man was ever born an heir to knowledge." (Scientific American, 1851)

Stehr & Adolf, (2016, 2018); Ruser, (2018) studied in their research (The Price of Knowledge) that the problem arises about "how to assess and measure the value or price of knowledge and probed the issue from a variety of social, scientific and practical perspectives" (Stehr, Adolf, 2016). Knowledge plays a strong role in all sectors of an economy. The image of knowledge creates difficulty when it is split up from its owner. As knowledge also has diminishing and obsolescence properties, there is a need to update the knowledge. Knowledge cannot be often captured in a simple and clear-cut manner. It is a complicated and technical process to assess the knowledge and execute it in the process.

Obsolescence is simply defined as "negative changes in capital values that are solely a function of chronological time" (Rosen, 1975). The price/value of existing objects and practices diminish over time owing to the new and current objects in a state. Knowledge obsolescence is a state in which the trendy, newer, and appropriate knowledge takes the place of the old knowledge because the previous knowledge becomes outdated or old-fashioned. In a society, for example, the stock of knowledge is revolutionized from time to time to stay updated. The graduates of different generations obtain knowledge differently from institutions, and "obsolescence is related to some concepts of vintage" (Rosen, 1975). The existing knowledge that is available to be learned is scientifically changing over time due to research and innovation that move forward. "Firstly, sometimes new knowledge proves the received knowledge to be incorrect or at least general than what was supposed at an earlier time. Secondly, production innovations often render skills useless and associated with past methods" (McKelvie, 2007). The individual who has past knowledge and skills can lead to capital loss in both cases. The discoveries and innovations expand the previously available knowledge in a more sophisticated and equilateral manner. In both cases --- knowledge is easily available and accessible to students and the innovation leads to improved teaching methods and creates a better, more creative and quality environment. The value-additional of knowledge resources is increased and the opportunity cost of learning gets decreased due to systematic changes in the knowledge process. At the end of changes in the knowledge creation process through new trends and innovations, the

net outcome of the educational institutions changes and becomes profitable. The revolutionizing process of knowledge can increase the capability of the current generation in the long run if they involve in learning something new in order to enhance their prior learning (Rosen, 1975).

Depreciation is a second concept that is negatively correlated to knowledge. As a person gets on in his age, his learning capability must decrease because of physical and mental conditions. Knowledge depreciation is defined as "negative changes in capital values which depend on the age of persons possessing knowledge and skills, and which are more or less independent of chronological time and generational differences" (Rosen, 1975). The knowledge depreciation increases when the age of individuals increases but their ability to implement the knowledge and skills decreases (Rosen, 1975; Gray, 2001).

Like physical resources, knowledge resources also depreciate. Gallagher, Grubler, Kuhl, Nemet & Wilson (2012); Grubler & Nemet, (2014) said that "knowledge can be accumulated (learned) but equally lost (unlearned) as well" (Grubler & Nemet, 2014). The reason of knowledge depreciation is directly linked with innovation policy. Knowledge integration is often ignored and too much and unnecessary focus is put on knowledge creation. This is the negative aspect of knowledge equation. Furthermore, knowledge depreciation has so far been one of the less researched areas.

According to Grubler & Nemet (2014), knowledge depreciation depends upon two variables. The first is the degree of "innovation-driven technological obsolescence" and the second is the knowledge depreciation due to turnover ("the rate at which employees leave a company and are replaced" (Shenoy, 2012)) of knowledge owners.

The world is quickly shifting towards modernism and technological advancement and the information and communication technology (ICT) area is an example of "innovation-driven technological obsolescence" (Thompson, 2001). The trends change in technology very quickly and consumers tend to dispose of the old devices because the new and better models with high technology are introduced.

Knowledge depreciation occurs as a result of employee's turnover in an organization. The turnover of knowledge holder employees in an organization leads towards knowledge depreciation (especially when these employees have a strong position in the organization's knowledge account).

The first type of depreciation occurs when the knowledge assets of an organization are highly in tacit form and in case of turnover in the organization, there is a need to obtain knowledge asset again (Argote, Ingram, Levine & Moreland, 2000; Argote, Beckman & Epple, 1990; Esposti & Pierani, 2003). The second type of knowledge depreciation takes place when the old knowledge becomes outdated. Here "knowledge can depreciate because of the insufficient recharge of knowledge" (Evenson, 2002), this happens when the financial condition of an organization is not stable with old knowledge getting irrelevant and new knowledge not replacing the old one.

The point here is that the goods or tools which used in any organization are based upon an idea that comes from a human being, so all goods, and tools are considered to be a part of knowledge. The idea on which a product is based is the main component of a thing, e.g., the whiteboard that is used in the classroom is based on ideas (knowledge), so anything that is made by a human being is a form of tacit knowledge.

According to Baetjer, jr, 2000, knowledge is extremely important with its accuracy. We might say that the larger quantity and good quality of knowledge lead towards better physical stuff or excellent performance. A computer, for example, has the software which is a sort of intangible knowledge that works in physical form i.e computer hardware (Bennet, 1985). It is now clear how tacit knowledge works in the explicit form of knowledge.

The rivalry among economies is increasing day by day and consequently the structure of organizations also changes from physical resources to knowledge resources. In all organizations dependent upon resources, the most tactically important resource is knowledge (Conner & Prahalad, 1996; Grant, 1996a; Grant, 1996b; Spender & Grant, 1996; Osterloh & Frey, 2000; Ghoshal & Nahapiet, 1998; Spender, 1996; Bapuji & Crossan, 2004. 2005; Bapuji, Crossan & Rouse, 2005). Information is different from knowledge:

> Orterloh & Frey, 2000 stated in their paper that "information is a flow of messages, while knowledge is created by that very flow of information, anchored in the beliefs and commitment of its holders... Knowledge is essentially related to human action (Nonaka & Takeuchi 1995, pp. 58–59)."

Further difference between explicit and tacit knowledge (Polanyi, 1966; Michael, 1966; Castillo, 2002) has been explained by Orterloh & Fery, 2000. To them, explicit knowledge is in the form of writing or symbols. Tacit knowledge is more complicated than explicit knowledge because it is based on human knowledge and "we know more information and knowledge but we don't know how to deliver and explain in the form of words and actions" (Polanyi, 1966; Michael, 1966; Castillo, 2002). The difference between explicit and tacit is important because the transferability and suitability are based on these two forms of knowledge (Grant, 1996a; Grant, 1996b). Tacit knowledge is the privately stored knowledge in human beings in the form of experience and skills which cannot be easily shared and transferred. Explicit knowledge is a form of public good that is available publically with the exclusion of copyrights or patents.

There are two consequences of tacit knowledge: the first is that it is important for competitive advantages because tacit knowledge has imitated element for the competitors (Teece, 1998a, 1998b); the second is that it cannot be measured easily.

The purpose of this study is to explore further about knowledge creation practices and their sources used in universities. Knowledge creation is an organizational theory for organizational learning. It is used in learning organizations. The precise description of organizational theory, organizational learning, and learning organization is given below:

1. Organizational theory: It is a concept used by an organization to understand the working conditions of employees viz-a-viz how they work in a challenging environment with organizational attributes (discussed in the literature). The organizational theory is made up of many concepts, ideas and beliefs derived from the nature of the organization (Bolman & Deal, 1991).

2. Organizational learning: It is based upon change in cognition or behavior (Easter-Smith, Crossan & Nicolini, 2000) and the prior knowledge and experience is the foundation of change in the organizational knowledge progressively (Fiol & Lyles, 1985).

3. Learning organization: It means the organizations that are meant for and capable of creating, collecting, and transferring knowledge with customized behavior to think deeply about new and fresh knowledge and insights (Garvin, 1993).

In Pakistan, less importance is given to knowledge management (KM) practices. If KM is organized and structured, the knowledge assets of an organization intending to establish values with the purpose of tactical and strategic specifications (plans, procedures, strategies, and organizations mechanisms) uphold and strengthen the stock, evaluation, distribution, improvement and knowledge creation practices in an organization. The study is about knowledge creation practices in university teachers so that we can achieve the objective of the status of knowledge creation practices and sources of knowledge creation, their gender comparison and the effect of the source of knowledge creation on knowledge creation practices. The entire detail about organizational theory, organizational learning, and learning organization is given below.

Socialization, combination, and internalization have several similarities with the features of organizational theory. As an example, socialization is related to the organizational culture theories whereas combination is linked with information processing; and the third is internalization related to the organizational learning.

1. Socialization → Organizational Culture/theory

2. Externalization → Information Creation/ Research

3. Combination → Information Processing

4. Internalization → Organizational Learning

Three out of the above four types of aspects as mentioned by Nonaka 1995 in his theory of knowledge conversion are: socialization, combination, and internalization – all are restricted analog with facets of organizational theory. As an example, the theories of organizational culture leads to socialization, whereas information processing (encoding to retrieval) is linked with combination, and the relationship of internalization is established with organizational learning. The concept of the fourth aspect of knowledge creation i.e externalization is not well constructed and an insufficient viewpoint has existed about information creation (Nonaka, 1987; Nonaka, Byosiere, Borucki, & Konno. 1994).

2.3 Organizational Theory as knowledge creation

The organizational theory is derived from the working conditions of industrial and commercial bodies. Max Weber was a major patron and organizer of the literature that is related to bureaucratic theory. Variety of ideas discussed in the 21st century theory like administrative

body, chain of command and their responsibilities have initiated from Weber's perception of the nineteenth-century organizational theory (Adams, Kutty & Zabidi, 2017). The knowledge and thinking of an organization is a tribute that has been powerfully portrayed in bureaucracy. Some other organizational theories were presented in the twentieth and twenty-first centuries but they could not move the bureaucracy theory from its place.

Organizational theory also supports management theory, as Hoyle (1986) clarifies:

"The idea of organizational theory is constructed through understanding. Then we can make an open variation within the organization theory and management theory to know which one is a practical (close to the reality) theory and accordingly focused on that theory to achieve organizational goals. Although the variation between both theories cannot be squeezed tightly because the research triggers on management theory so that too much variation grounded the management theory and the research contribution changes towards the organizational theory." (p. 1)

Holye (1986, 2005) mentions that leadership and management can be improved through organizational theory. In the UK this area was firstly called "educational administration" after that "educational management and at last jumped on the title of "educational leadership" (Gunter, 2004). The UK professionals kept in their mind all these progressions and the professional association of the UK mirrored all these captions from the initial stage to the last one and at the end, now its name is "British Educational Administration Management and Leader Society", and the "Society's International Journal, Educational Management, Administration and Leadership" (EMAL). The launch of the "National College for leadership" starts with the move of a professional association of the UK in 2000, portrayed as a change in fundamental approach to modern approach by Stoll & Bolam, (2004). The question arises by Bush (2008) that either these approaches are merely worked in semantic motion or they depict an extra essential alter in the formulation of principal ship idea. Here the question arises about the component of organizational theory and its linkage with administration, management, and leadership.

2.3.1 Attributes of Organizational Theory and knowledge creation

Organization theory is based on a challenging environment. Many researchers have worked on organizational theory and it is obvious that the most compassionate work on organizational theory has been done by Greenfield (1973) and Hodgkinson (1978), though all the

work of both researchers has not been well known among various and diverse opinions by researchers. Organizational theory takes into account numerous concepts, ideas and beliefs derived from the nature of an organization (Bolman & Deal, 1991; Thompson, 2000). This leads towards the very initial stage of quality being a part of organizational theory which is the norm-setting (Bush, 2011, 2015). Precisely the theory sets the standards of organizations. The normative approach focuses on the management of an organization rather than the functions of the organization. It is concerned with how an organization is managed by competent leaders and managers (Simkins, 1999). Furthermore, some confusion is created between "is" and "should be" because the writer is not always in a normative position.

The second attribute of this theory tends towards being selective. Other approaches may neglect by choosing of sole and unique theoretical framework (Bush, 2011). The flash of light on the only quality of organization leads to keep other features in darkness and the optimism becomes missing in the organization. The exploration for a 360-degree theory has remained unsuccessful.

Analysts have focused on four aspects of the organization by comparing distinct approaches through investigation. The four aspects are as follows:

1. Goal: Theory and practice in education and prior knowledge is the core of organizational purposes. There are two most common aims focused by the theorists. "To start with, who settles on the goals of the organization?" before this question the other queries also arises … the first one is about the goal of the organization: whether is will be achieved internally or externally. The second perception is to detect the visible awareness about the organizational goals. It is safe to say that they are grasped by all partners.

2. Structure: Structure is a standout amongst the most noticeable parts of the organization but it also serves to distinguish them. Structures can be either vertical or horizontal and might depict through differences. There is a "fixed structure," having little concern with an individual's natural abilities and experiences, and a "flexible structure", which adjusts to going well with the abilities of other team members. Within an organization, it is yet t be determined who holds major importance: the framework or on the individual/staff that plays diverse roles according to their job description.

3. Culture: Interestingly, organizational culture tends to be hardly noticeable. Thoughts and ethos are intangible processes dealt with by a large number of researchers. The management of culture in organization theory differently interacts with how it is produced, sustained, and altered. Values might be obvious and non-debatable in educational organizations that have their own sets of beliefs although it's considerably harder for secular organizations. The leader also finds that intangible things are hardly changeable, and the culture being intangible due to its relation with values and beliefs makes it too tough to accept innovation.

   Context: Educational institutions are a common mark of each society in any nation of the world. The importance of the trend of context is growing day by day which is recognized by organizations (Leithwood, Jantzi & Steinbach, 1999a, 1999b). Small educational institutions in the rural areas of developed countries are different from the big educational institutions in a developing context. The difference arising out of area context creates a challenge for the theorists, who had developed the organizational model with the assumption of universal applicability. The connection between the organization and its outside condition is obvious but partly influenced by the context. The environment is the ground for for-profit or profit-oriented organizations and symbolizes the stakeholders for public sector bodies. The connection between the organization and its stakeholders is an essential variable for researchers

2.3.2 Management and Organization Theory

The language of leaders plays an important role to set up ideas of administration and management that have been connected or superseded; however, the exercises and actions attempted by senior staff are defended against such label.

Learning is a unique and fundamental intention of an educational organization and successful leaders are progressively centered on it. They also face and confront extraordinary accountability stress especially when the business is result-driven. As these natural and external stresses intensify, the leaders and managers need more noteworthy comprehension, expertise, and versatility to maintain their institutions. Senior staff necessarily requires appreciation to enlighten and support their proficiency and professional practice progressively.

All management models are insufficiently discussed in this literature because all models have a different and uni-dimensional point of view on educational institution management. To

differentiate among these models, various techniques can be applied. Through attributes of organizations, we can differentiate between them by looking at the models having all attributes. The organizational attributes are mentioned below in the detailed form:

Goal-setting is an important part of an organization, and every organizational theory has a different assumption about it. In some management systems leaders counsel others before deciding and articulating the goals. On the other hand, in some systems, positional leaders think that setting is their right and devotees are expected to acknowledge and execute these objectives beyond a shadow of doubt. In this setup, specifically, management is expected to have the official authority to choose the goals of its organization.

The procedure of following the leader is different in transformational management even though the goal-setting of the organization largely depends on the transformational leader. The leaders use their charismatic personality rather than positional influence to inspire the colleagues and staff to work on the goals of the organization and achieve them with mutual efforts. Such chivalrous leaders might have the capacity to increase help for both valuable and less valuable goals – here a question arises: is there any resemblance between Nelson Mandela and Adolf Hitler.

Goals are quite challengeable and difficult as stated by many scholars and researchers. For the achievement of goals, there should be plans to be followed for accomplishing organizational goals. Leaders also need consultation with supporters to secure acknowledgment of their own needs; this type of management is transactional management. To get the followers' support for achievement of goals, leaders often offer inducements in the form of promotion or increment. However, this support from the followers is possibly limited or short-term for particular goals because they require efforts on part of the leaders motivating change.

The goals should be commendable and ethical in moral management, and this type of management shares numerous attributes with transformational approaches. In this model, sharing the moral purpose of the leaders, the devotees are prepared to adopt and follow the organizational goals. The goals are highlighted by a spiritual dimension and the beliefs are broadly shared in faith schools. In any case, this can be awkward for the staff that doesn't have the stamina to distribute the ideas to others to a large extent. In the UK, faith schools require

management with spirited and vital abilities to manage gathering specifically religious crowd and its support for spiritual qualities.

Of the models discussed so far, the participative management model is quite distinguished. In the participative model, the management focuses on the accomplishment of consensus to reach organizational goals by practicing and chasing them through proper channel. This management model is thought to return a profit in the form of the most promising way by following goals that develop from staff ownership by considering the participative procedure. The organizational goals approved by designated management are very important and help in avoiding the problem in the goal-achieving process as in participative management everyone shares authority so the formal management might be in the scenario where there is a working position regarding protecting the goals.

Distributed management is revealed through shared effort and common working conditions (Harris, 2004) and its key factors look similar to those of participative management and other approaches which hold shares. Formal management is also important in the decision-making process regarding the achievement of organizational goals so separating management from the power of command can enter the organization in a phase of eliminating some element of the organization. Only concentrating on goals is not just important without the clear determination of goals which is hardly possible in the absence of the power of command. Gronn (2010) also agreed that the achievement of objectives is impracticable without proper leadership as considerable power is vested in leaders who enjoy the strength in the decision-making process.

Teachers feel powerful in the shade of teacher management (Muijs & Harris, 2007) although decision-making powers towards the achievement of goals do not simply depend on the strengthening but also need to be committed. Thus educators might have to maintain goals in every unit and department as far the reliability of other organizations is concerned. The head is normally the creator of teacher management and is probably not going to encourage this approach on the off chance that it appears to probably prompt an objective clash.

The notion of organizational goal is disputable from the perspective of post-modern management. Greenfield (1973) contends that the most influential individuals have their aims which are further called organizational goals. This connects to basic feedback of much

organization element which redefines schools combination for instance; the institution is alluded to as it was a corporate organization . . . mainly of the common population which constitutes it" (Hoyle & Wallace, 2005). In this model, the goal and vision of educational institutions are treated as fiction.

In different models, the notion of the organizational structure shows different meanings and senses. A top-down approach offers the basis of managerial management; in other words, the decision-making process is under positional authority as the managerial management is a centralized framework. So the structure of managerial leader is vertical and accountability is to the next level in the chain of command, both inside and outside the organization. In this model, not too much attention is given to the individual variable in front of positional authority as the latter is predominant in managerial management.

A very large number of resources are put into the persuasive intensity of leaders in transformational management so the structure of this management model is expected to be a vertical structure. Supporters are fundamental to this approach, and this additionally involves hierarchical interaction and connections. There are limited opportunities for supporters to involve in the decision-making process of an organization as the primary assumption is that high-rank management (the vital) can influence supporters of the value of its vision.

A split or divided structure leads towards transitional management, with leaders negotiating with adherents to secure the execution of their goals and policies. For short-term support from supporters, the leaders introduce an exchange process in which supporters are offered inducement to secure the leader's plans and strategies. The traditional hierarchical structure does not feel comfortable with this process.

The idea of moral management is comfortably aligned with the culture than with structure as this management pays much attention to values and beliefs, and shows limited direction towards the organizational structure. Though, the connections amongst leaders and supporters might be viewed as like those predominant in transformational models, however with a more powerful moral basis. Moral management is more likely to focus upon target goals that are dependable on the values of the leader while the main criticism on transformational management might not be recognizing valuable and invaluable goals. This model recommends a

solid accentuation on the chain of command, as it happens in numerous religious educational institutions, but with a solid moral framework.

The lateral structure is the basis of the participative management model which is different from the models discussed so far. The main assumption of this model is that all organizational members ought to have an equivalent chance to involve in the decision-making process of an organization. In professional organizations, professionals are widely increased and structures are viewed as vehicles for empowering such professionals to advise the management and to take part in the decision-making process. The chain of command is flattened and the system of expanding structure is not like typical managerial structures. In other words, the structure of participative management is significantly less pyramidal. These types of structures are more commonly used in small organizations rather than large organizations.

Distributes management may seem to propose flatter structures, with importance laid down on influence instead of formal authority at the same time. Gronn (2010) comments that the principals of organizations have impressive power, and recommends that the chain of command order is not redundant. Variety of influences may occur by the distribution management as per Bennett, Harvey, Wise, & Woods (2003) and they also said that these influences include top to the bottom idea from a solid or captivating management. This management is based on both vertical and horizontal approaches and has both elements on it, so the distributed management opposes the conventional distinction of structures, and the structures depend upon particular contexts.

Lateral structures lead towards teacher management in which teachers cooperatively work with colleagues to bring about change. This also prompts entire educational institution development and this may be viewed as a reversed or grass root (bottom to the up) structure. Research in UK schools was conducted by Muijis & Harris (2007) and they found out various groups of teacher-management present in formal and informal ways. The implantation of distributed management is not possible without teacher management. This recommends teaching management step-ups who should focus as both vertical and horizontal structures, as noted earlier on.

The relationship between members is the basic concept of post-modern management and other related models. This model abstains from the concept of organizational structure as it

believes in the theory of interaction between people within an organization. In other words, the model relies on ideas (human capital) rather than a physical structure. Human capital is the asset of an organization so that if an organization has strong human capital then external trapping cannot affect the structure (Greenfield, 1973). In post-modern management structure, significant importance is given to individuals' behavior. The individuals effectively and efficiently build and multiply the connections that support the post-modern management structure. However, a single individual cannot fit in this management model as it has a predetermined structure. Therefore, both leaders and individuals (human capital) are important according to this model. All the above discussion shows the balance between adopting the role and producing the role (Hall, 1997). At the end of this discussion, the question arises whether instructors and leaders acknowledge their sets of expectations or bring them again in a new way.

Culture mostly affects education as everyone in this world living in a society or community follows specific norms, customs, and values that collectively make his culture, and education system of a society is based on that particular culture. Education in any society takes place with the emerging role of organization and society, and interest in the effects of culture on education is increasing day by day. Bottery (2004) makes us alert about "social globalization" which has been on the rise due to non-critical acceptance of international standards and ignorance of local and national traditions. There is a variety in the dimensions of societal culture. Seven dimensions have elaborated by Dimmock & Walker (2002). The division of power and convergence with the team is notably important for organizational theory and management of the educational institutions. In any society, culture plays a vital part and every organization has its own culture and the leaders might have the capacity to influence the societal culture in order to preserve the organizational culture. In organizational cultures, the standards and implications of organizations give attention to the values and beliefs of individuals. The idea of culture expressed through value and custom as shown through the lifestyle of a specific society/ community may be labeled as "identification of heroines and heroes" - symbolically the bond between a culture and educational organizations.

In connecting a society to educational institution management, a focal factor is the unity of culture inside the organization. A unified culture is assumed in managerial and transformational management. It is frequently connected to the formal authority visions for the educational institutions, which the supporters are required to grasp. In moral management, the

way of life is connected to the overall belief of the main group; for example, in educational institutions the main part is made up of convictions which may be responsible for making strong enlisted learners and selected staff in consonance with the predetermined faith.

Uniformed cultures are associated with the distributed, participative, and teacher management frameworks. However, this is expected to rise, and to be fortified, through collegial movement instead of being determined at the highest point of the organization. In light of unique qualities and interests, the transactional management models largely focus on sub-culture. These are accommodated, for the time being, throughout the interchange practice that depicts the model. In post-modern management, the main idea emanates from the accepted sets of beliefs and values.

In any case, these different viewpoints also recognize that culture is persevering and change is time-consuming. Hargreaves (1999) observes that it is hard for people to change their beliefs and values. Culture is most agreeable to change on the off chance that at least one of the accompanying conditions emerges:

- The educational institution faces a conspicuous critical moment, for example, the review report with adverse remarks or a large number of students diminishing from enrollment.

- The leader is exceptionally appealing, summoning steadfastness and adherence. This is a solid part of the transformational process in an organization.

- The leader succeeds an exceptionally poor key, with the goal that staff is looking for another direction.

(Adapted from Hargreaves, 1999, pp. 59-60)

Indeed, even in such conditions, social change is not guaranteed in any way, shape, or form. As an outcome, leaders frequently fall back on altering/changing structure. Even though structure might be viewed as the "physical manifestation of . . . culture" (Bush, 2011, p. 180), Schein (1985, 1990, 1997, 2010) alerts that culture can't be eliminated from the main idea as it brings fruitful results.

As mentioned before, educational organizations are widespread; however, scholars are likely to provide inadequate thoughtfulness regarding context while talking about different models.

For instance, the size of a school or institution can significantly affect the pertinence of administration models. Participative methodologies are substantially simpler to be implemented even in little grade schools while expansive secondary schools are stratified by subject divisions, and different courses, prompting administrative and value-based methodologies to be more appropriate. Another critical variable is identified with area. Country institutions might close to main proof with their levels while those in many urban areas find such relation harder to make and establish. Also, contrasts crosswise over nations impact the legitimacy of initiative models. In very brought-together settings, as found in majority of Asia, Africa, and Eastern Europe, management and sequence are underscored, making it more unavoidable that administrators will effectively work as administrative initiators.

As mentioned earlier, institutions have many common organizational theorists. The aim is work effectively and to give much attention to every concept while discussing different models. For instance, the size of an institution can have an important impact on the application of various management models. Participative theories are more convenient to apply at small preschools while big high schools are stratified according to subject departments, and in many ways lead to transactional and managerial theories that are more important. Another important thing is related to location. Rural institutions might have a deeper identification with their societies while in large cities such contacts are more difficult to develop and maintain. Therefore, differences among countries influence the validity of management approaches. Highly centralized contexts are found in many countries of Asia, Africa, and Eastern Europe; bureaucracy and hierarchy focus on developing these contexts so much so that principals will work as managerial leaders.

Many organizational theorists have responded to such various contextual variables by making the identification of contingent leaders. In this model leaders respond to different situations or issues they face through their behavior. Principals should acquire, and use, a large system of management practices (Leithwood, Jantzi, & Steinbach, 1999). Hence for "conceptual pluralism" (Bolman & Deal, 1991), instead of rigid adherence to the only model, circumstances and context can be taken as indications which apply to both practitioners and theorists.

The influence of culture on education may take place at two levels: social order and organizational level. Bottery (2004) gives us a caution about "social globalization" (p. 36) which

emerges from non-critical acceptance of international standards and ignoring local or national traditions. There are multiple dimensions of societal culture, and seven dimensions have been highlighted by Dimmock & Walker (2002). These comprise power "distribution/concentration", and "group/self-orientation", which are especially important to organization theory and educational institution management.

According to the social norms of a country, leaders might have the capacity to influence the societal culture which resists the organizational culture. In organizational cultures, through the process of regular sharing of the standards and implications, the organizations can give attention to the values and beliefs of individuals. Culture is emphasized as a collection of "ceremonies and rituals" and may be known as the introduction of heroes and heroines as they are the symbols of cultural values in educational institutions.

In connecting society to educational institution management, a focal factor is regardless of whether culture is seen to be unitary inside the organization. A unified culture is assumed in managerial and transformational management, frequently connected to the formal authority visions for the educational institutions, which supporters are required to grasp. In moral management, the way of life is connected to the overall belief of the main team. These schools, for example, main parts have specific set up convictions, which may be added to strengthen by highlighting students, and selective members who are people from the predetermined faith.

Uniformed cultures are associated with the distributed, participative, and teacher management frameworks. However this is expected to rise, and to be fortified, through collegial movement instead of being set at the highest point of the organization. In light of unique qualities and interests, the transactional management models largely focus on sub-culture. These are accommodated, for the time being, by this exchange method the models portray. The importance of post-modern management deals with the personal beliefs and values of individuals in any organization.

In any case, these different viewpoints also recognize that culture is persevering and change is time-consuming. Hargreaves (1999) observes that it is hard for people to change their beliefs and values. Culture is most agreeable to change on the off chance that at least one of the accompanying conditions emerges:

- The educational institution faces a conspicuous critical moment, for example, the review report with adverse remarks or a large number of students diminishing from enrollment.

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Indeed, even in such conditions, social change is not guaranteed in any way, shape, or form. As an outcome, leaders frequently fall back on altering/changing structure. Even though structure might be viewed as the "physical manifestation of . . . culture" (Bush, 2011, p. 180), Schein (1985, 1990, 1997, 2010) alerts that culture can't be eliminated from the main idea as it brings fruitful results.

Association scholars have reacted to such factors by building up the thought of unexpected administration. Leaders need to organize and use a well-developed model of administration (Leithwood, Jantzi, and Steinbach, 1999). Therefore "theoretical pluralism" (Bolman and Deal, 1991), is not favorable to inflexible condition to one theory paying little attention set and well condition, a message which is related to two experts and researchers.

2.3.3 Organizational Theory and Educational Institutions Management for Knowledge Creation

Knowledge management is a general term and knowledge creation is a part of it. The management styles are at the core of knowledge management. There are numerous options and challenging models for management of educational institutions (Wolfe, 2015; Bush, 2011; Savin-Baden, 2007; Bush & Glover, 2014). Leaders promote knowledge creation in organizations with their knowledge insights and sharing activities. Different management models have been reviewed to find out the similarities between them, and they are mentioned below.

2.3.3.1 Managerial management and promotion of knowledge creation

Top management takes part in the promotion of knowledge creation activities in an organization with its dynamic skills. The functions, assignments, and practices are the most focused points for managerial management to encourage other staff in the organization. Reasonable and balanced behavior of organizational members strongly leads towards managerial

management. The official positions are greatly influenced by the authority and the status of an individual in an organization's hierarchical chain of command (Zahn, 1991; Leithwood, Jantzi, & Steinbach, 1999). Bush & Glover, 2014 further said that there is sufficient evidence in most of the literature regarding the support between management (a leader who performs to complete a specific task) and ruling authorities (leaders with professional and proper norms and provisions) in managerial approaches to exercise command in managerial management.

In different research studies, there is reference to the work of Weber (1989), and many researchers and theorists have said that Weber's efforts were notable, constant, and relevant to the organizational theory. There are many aspects of Weber's model that have been involved in managerial management. All these are mentioned below:

- Structure: There are different official management hierarchies for distinctive positions in proper sequence. The authority structures have different levels of hierarchies.

- Goal orientation: Formal leaders set clear targets for the goals and directions of an organization.

- Division of labor: On the basis of expertise, employees should be classified for their particular job responsibilities and activities.

- Impersonal connections amongst staff, and also with customers.

- Accountability to the formal order of organization, instead of to institution-level partners (Bush, 2011)

In a centralized education system, this model can be broadly observed especially in Asia and Africa.

2.3.3.2 Knowledge creation and managerialism

The establishment of knowledge management and organizational philosophy in an organization is under managerialism. The managerialism supporting institutes or organizations are better in their management activities as compared to the organizations that don't support managerialism. In educational institutions, the educational process becomes more smooth and stronger with completion of their purpose as the educational institutions are intended to provide their services by encouraging managerialism. All this may more likely to increase pressure with

the warning of quality but worth free management, concentrating individually purpose, what researchers demanded on 'management to excess'. Alluding to England, Simkins (2005) asserts, against traditional professional values, the managerial values are being set; these managerial values are planning and target setting for an institutions or organizations. The solid element of bureaucracy is target setting which is very important for goal orientation. Goldspink (2007a, 2007b) adjusts managerialism to 'New Public Management' and mentioned in his research that close connection with active engagement between educators and educational institutions makes interconnection more attractive and practical involving professionalism. "Close connection" is likewise an element of Weber's bureaucratic model, inside an emphatically various leveled system.

2.3.3.3 Transformational management

Transformational leaders have the capacity and they claim about it as well and that is creating knowledge in a way where the end product of many types of research is reflected in transformational leaders. The responsibilities and the competence of organizational members are determined by the management. The extra effort and great productivity are the results of great level of commitment towards the assigned duties. The required competence for the achievement of goals is also needed in organizational members (Leithwood, Jantzi, & Steinbach, 1999).

Weber's (1989) notion of charismatic management serves as the origin of transformational management. Weber's model spotlights the individual characteristics of senior leaders in an organization. The organizational members set out a vision and support to follow their interests and affairs chained with the vision of the organization to achieve organizational goals. Transformational management is a monolog (solo management) with absolute power of decision making.

Leithwood (1994) suggested his seven quantitative types of research that can help the model of Normative Transformational Management empirically with the support of Leithwood & Riehl, (2005); Leithwood Leonard & Sharratt, (1998). He concludes after studying seven quantitative types of research in the following words:

"Transformational management practices, considered as a composite construct, had significant direct and indirect effects on progress with school-restructuring initiatives and teacher-perceived student outcomes" (p. 506).

The leaders strongly influence activities and outcomes process because transformational management is a widespread model with a normative approach. The acceptance of leader is more important and the obedience to leader's values is good for the achievement of organizational goals. This model is censured because it is just like going more importance to a vehicle for control over instructors (Chirichello, 1999a, 1999b, 2001; Bush, 2003, 2007; Al-Taneiji, (2006).

There is a need to work on contemporary strategy inside the educational institutions for the legitimacy of the transformational model despite its prevalence in the research studies. To support the transformational language utilized by the government, professionals are required to receive and execute centrally decided strategies (Bush, et al., 2009). In South Africa, for instance, the transformational language is utilized to support a non-racist post-Apartheid education framework. The strategy is imagery galore; however, it is getting feeble by and by in because of the fact that many leaders of educational institutions do not have the potential to execute change effectively because they don't have enough power to alter something (Bush, Duku, Glover, Kiggundu, Kola, Msila, and Moorosi, 2009a, 2009b).

There is a strong need to introduce a system for school leaders in the English system that could affect objectives, curriculum, instructional methods, and absorb additional values to hold fast to the government strategies. In this regard, transformation might be an independent practice of execution without setting particular appraisal that is the requirement for individual educational institutions and their networks. As Bottery, 2001 said in his research that the educational system that has characteristics of centralization and is instructed by others has significantly changed the power of transformational education and management from increase to decrease. Another issue that leads towards organizational decline is the gallant management that does not support the sustainable promotion of the organization.

The educational objectives are achievable when the transformational model works well in an organization and also engages all stakeholders in this process. The connection between leaders and their followers should be friendly and leading to the agreed decisions. Transformational management may not remain effective when pressure is put on leaders to wrap up management qualities and leaders are instructed to execute instructions of the governing bodies (Bush & Middlewood, 2013; Bush & Glover, 2014 Bush, 2011). All in all the managements may lose their impact if duplicity is involved.

2.3.3.4 Transactional management

The role of transactional management in organizational creativity and innovation is undeniable and this is done between the two: the leaders and the employees. Transformational management frequently appears differently from value-based methodologies (Bush, 2011; Miller & Miller, 2001). Transformational knowledge is more successive in creating and distributing knowledge. On the other hand, transactional management is more successive in the utilization of knowledge. The exchange of valued resources is the basis of the connection between leaders and teachers. In its easiest form, teachers give instructive services (lectures, students' skill and ability building exercises etc.) and take salary and other benefits in exchange. This model is derived from the political parts of the organizational theory. To secure organizational goals, leaders should act politically for looking at the impact of individuals to achieve the desired targets through transaction behavior.

2.3.3.5 Moral management

Moral management is rooted in the ethics, beliefs and values held by leaders in the management system. What justifies the authority and influence of leaders is that they know about what is right and accurate (Leithwood, Jantzi, & Steinbach, 1999). Many terminologies have been coined by different researchers to depict the exact value which is relevant to esteemed management (Stefkovich & Begley, 2007; Starratt, 2005a, 2005b, 2005c), "management with reliability and authenticity" (Begley, 2007, 2009), "metaphysical management" (Berry & Woods, 2007; Bush, 2010), and "artistic management" (Deal, 2005; Bush, 2010, 2015).

Two approaches have been discussed by West-Burnham (1997a, 1997b); Bowring-Carr & West-Burnham, (1997) that might be classified under the umbrella term of 'moral'. The first approach is 'spiritual' and it is identified with "the recognition of the fact that many leaders possess what might be called 'higher order' perspectives. These may well be . . . represented by a particular religious affiliation" (p. 239). The origin of the self-awareness of leaders always depends upon their sets of values. A survey was held in England by Woods' (2007); Berry & Woods (2007) on teachers in which it was found that 52% teachers were encouraged by their management with some kind of extraordinary power related to spirituality" (p. 148). The second approach given by West-Burnham's (1997) is "moral confidence," (p. 241) - the ability to act in a way that is steady with a moral system and is predictable after some time.

For moral and managerial management, Sergiovanni (1991) contends:

Managerialism and morality are two contending goals that are based on peace, and making peace is one of the toughest challenges for the management. To neglect the two creates issues so obvious and impossible to avoid. Every educational institution must develop a learning network for survival and the managerial and moral imperatives are the bases of every institution. (p. 329)

2.3.3.6 Participative management

In shared management models, the participative management stands out as the most important position. Leithwood, Jantzi, and Steinbach (1999) said that this model agreed that the foundation of management is all about sharing and collaboration with each other to understand the viewpoints of others for reaching a better decision. This is a standardizing model supported by four focal contentions:

- The effectiveness of educational institutions should increase with the participation of its employees so they may own the decision.

- In a proficient environment, the democratic principles are defensible and helpful for participation.

- Participation develops the connection between staff and executives working together for concurred goals.

- To prompt the idea of management density, the participation builds the aggregate management accessible to the organization (Leithwood, Jantzi & Steinbach, 1999). Bramble, 2011 is also in favor of group practice and activities in the organization to enhance a collaborative learning environment.

Savery, Soutar & Dyson (1992) said that the workers want to involve themselves in the process of decision-making by giving their ideas or opinions. They also expect that organizations will acknowledge and execute their choices. For employee participation, Cludts (1999) likewise focuses on the moral facet.

2.3.3.7 Distributed management

In the twenty-first century, the distributed management has turned out to be the most preferred management model. Gronn (2010a, 2010b) said that many researchers' and surveyors' attention quickly diverts to the main characteristic emphasizing that the distributed management is a brilliant idea that emerged in the field of educational management in the past decade.

Understanding distributed management from the initial point, it's important to separate it from the chain of command. As Harris (2004) pointed out that "distributed management concentrates on engaging expertise wherever it exists within the organization rather than seeking this only through formal position or role" (p. 13). Gronn (2010a, 2010b) indicated to switch from royal to distributed management as a gesture of standard-setting in organization. Moreover, it is also a warning against the views that the diminishing role of the administration is called distributed management. Undoubtedly, Hartley (2010) contended that "its popularity may be pragmatic: to ease the burden of overworked head teachers" (p. 27). Lumby (2009) further added that distributed management "does not imply that school staffs are necessarily enacting management any differently' from the time 'when heroic, individual management was the focus of attention" (p. 320).

The growing connection among individuals in an organization in which they share their ideas is a new characteristic of distributed management. Although Hopkins & Jackson (2002) contended that without dynamic encouragement of higher authorities, the official leaders cannot provide an organized and sustained space for distributed management to take place. Management generally has an impact process. A core issue is "who can exert influence over colleagues and in what domains?" (Harris, 2005). Heads hold significant official authority in organizations. Hartley accomplished that when formal bureaucracy existed in the educational institution then the distributed management vanished away. The influence of informal sources is important in the view of Harris, 2010. He has also recommended that the gap between formal management increases the progress of distributed management in the organization. Harris also said in his research published in 2005, that management having distributed and hierarchical qualities are compatible with an organization but it is clear that without the approval of formal management the distributed management cannot flourish.

The involvement in, and courage for, the distributed management is expected on the assumption that it will achieve a valuable influence that might not have happened with a particular administration. Solo management does not work like compound management because the latter functions well in groups and distributes ideas more successfully. Leithwood, Day, Sammons, Harris & Hopkins, 2006 expressed that "total management accounted for a quite significant 27 percent variation in students' achievement across schools. This is a much higher proportion of explained variation (two to three times higher) than what is typically reported in the studies of individual head teacher's effects". They further stated that the educational institutions with great management influence have the highest level of student achievement. Hallinger & Heck (2010a, 2010b), Heck & Hallinger (2010) also found that the significant modification in institutional capacity and the development of a student are the outcomes of distributed management.

As recommended before, the current authority structure in educational institutions gives a potential boundary to the fruitful presentation and execution of distributed management. "There are inherent threats to status and the status quo in all the distributed management systems" (Harris 2004). Fitzgerald and Gunter (2008); Gunter & Fitzgerald, (2008a, 2008b) alluded to the residual significance of specialist and chain of command, and noted the 'dark side' of distributed management. With any judgmental view, it can be concluded that power relations amongst leaders and their supporters is quite strong (Law, 2010).

These doubts recommend that a suitable atmosphere is a necessary prerequisite to significant distributed management. Creations of collective responsibilities are the main motto of distributed management as mentioned by Harris (2005). He added that the meet-up time is necessary for all educators for healthy discussion with the leader. Harris further mentioned in his research that pleasant relationships are necessary between staff and managers as the latter may "feel threatened" by teachers going against the positions of management. Despite these doubts, the studies show that the scope of management can expand through distributed management and the achievement of students also increases while building the formal management of the future. Gronn's (2010a, 2010b) "half breed" model of administration may offer the possibility to tackle the best of both individual and distributed approaches.

2.3.3.8 Teacher Management

The distributed management and teacher management have close and clear linkages with each other. Frost (2008) discussed that the distributed management includes compound management while teacher management involves the advancement in work, knowledge building of teachers and teacher-voice.

The research work done by Muijs & Harris' (2007) in three schools of UK said that:

To empower teachers, teacher management plays an important role. Besides, good practice and activities introduced by teachers enhance their share of empowerment. A variety of conditions are required for teacher management to set up an educational institution which is more influential; encourages trust ambiance environment; builds effective structures for teacher management; improves transparency and well-built management system – all is done with the help of heads of institutions whose involvement in the creation of teacher-management and professional development is very important.

Student achievement is very important for an educational institution as endorsed by Timperley (2005) when he said that the appraisal of teacher-management should be based upon the student-achievement with the acceptance of challenges occurring in the process. Teacher management with high worthiness among their colleagues is not important for those with prior proficiency. Micro politics may damage the worth of leaders who are proficient inside an educational institution. The teacher management process is managerial and conservative contained in the ideas of Stevenson (2012). The idea of Helterbran (2008) is that teacher management continuously exists in the academic environment. The entire path in which teacher management has been constructed explains that teacher management is at core.

Muijs and Harris (2007) infer that:

The dynamic action by teachers is very important for teachers' management for the creation of management groups and their management responsibilities. For the common vision of an organization, transparent management structures, and a well-establish management development program are essential because they ensure a trustworthy culture and collaborative environment.

2.3.3.9 Post-Modern management

The subjective organization theory is related to post-modern management presented in various research studies conducted by Greenfield (Greenfield, 1973, 1984, 2004; Greenfield & Ribbins, 2005). The above mentioned relation is described by Keough & Tobin (2001) in their research that the present culture that defines the postmodern approach has a variety of subjective truths which are defined through experience and this approach is also delightful because it diluted the concept of absolute authority.

The weight of this model is clearly on individuals instead of organizational mission and vision as this perspective is the result of multiple researchers' work that could be blended. According to this postmodern perspective an individual is the specific element. The specific idea of "organization" is challenged by this point of view, as it attaches more importance with staff connections and interaction rather than the official authority. The characteristics of plurality and freedom are the two characteristics related to the post-modern approaches (Chen & Dixon, 2012). Shockingly, this model might have been effective since "Greenfield's labeled heyday" in the 1980s. The perceptions and ideas of individuals about planning and conducting qualitative research are recognizable by academies. However organization are rigid and less agreeable to apply these perceptions and idea. This might be because post-modern management offers few signs concerning how a leader should work.

2.3.3.10 Contingent management

Different models of management have been examined in the preceding lines. They give substantial and supportive information about management. The total picture of the educational institution cannot be given by these models. Lambert (1995, 2011) comments that there is "no single best type". The contingent model gives another option to the management approach, perceiving different ideas of educational institutions, their settings, and the benefits of adapting management styles to specific circumstances, as opposed to adopting a "one size fit all" position.

This approach expects what is vital and how leaders react to the exceptional organizational conditions or problems. As there are wide varieties in the management settings therefore these settings need different management reactions. (Leithwood, Jantzi & Steinbach, 1999, p. 15)

Yukl (2002) observe that, "the managerial job is too complex and unpredictable to rely on a set of standardized responses to certain events. Efficient leaders are continuously involved in analyzing a particular situation and evaluating how to adapt their behavior to it". This is what Vanderhaar, Munoz & Rodosky (2007) recommend, saying that management is contingent upon the situation.

For most suitable reaction to an issue or condition the management needs a viable diagnosis of the problem (Morgan, 1997; Morgan & Adams, 2009). This reflexive theory is specific in terms of the main disturbance where leaders need the capacity to survey the circumstances deliberately and to respond suitably to that condition rather than depending on a standard management model.

2.3.3.11 Role of Organizational Management to Promote Knowledge Creation Practices

Designing suitable construct: Transformation and creation of knowledge are not easy as we think. To build the environment of sharing between staff about their experience and information, to enhance and integrate their perspective and perception, and to assess their thoughts for knowledge creation and transmission, managers should develop a proper structure in an organization. A proper and appropriate structure can bolster critical thinking, basic reasoning, and development that are imperative for knowledge creation and exchange.

Designing: Training is very important for individuals to work with an organization as a part of a team or a group, to handle the duties and responsibilities, and also share and communicate their knowledge and experience with others. Likewise, individuals need to know how they can recognize their problems and how they will be able to deal with their problems successfully at their during workplace.

Motivation: To promote sharing knowledge and ideas between individuals and groups, a manager should create a proper environment in an organization. The staff of an organization must know that the aggregate ideas are better than personal thoughts. To support teamwork and idea sharing, organizations should offer incentives in this connection.

Technology: Communication is a vital component that influences learning and knowledge sharing and creation. The Knowledge-creation and passing it on can become complicated if effective communication does not take place among the members of an

organization. For effective communication, managers can utilize innovative techniques such as using technology (media and internet). E-learning, social media networks, video presentations are extremely helpful for this purpose.

2.4 Organizational Learning and Learning Organizations

An organization's potential to training and learning has been associated with an essential way of competitive advantage. Hussein & Ishak (2006) narrated that organizational learning uses to get better advantages of opportunities along with the quality of being responsive to development in an organization. Impressively, "organizational administration, management, and intellectuals have moved towards the realization that knowledge assets and intellectual capital can be the perfect supply of competitive advantage. This is different from the total dependence of traditional factors of production" (Morgan & Turnell, 2001). This provides proof to the justification given by Handy (1990) more than a period of thirty years ago, that the intellectual capabilities and knowledge resources of an organization stay for a longer time than the material resources. This study will also focus on the concept of learning organizations and organizational learning to distinguish between them and to develop an understanding of knowledge creation of organizations; with discussion on how these concepts are related to the knowledge creation.

The activities of universities are significantly connect to learning e.g., research, directional advice from supervisors, and instruction from teachers. Therefore, it is not correct to limit the universities as simply learning organizations (Siadat, Hoveida, Abbaszadeh, Moghtadaie, 2012) because as it is not the learning organizations only that provide learning; there are many other ways prevalent and useful for learning. Furthermore, the relation between individual and collective learning is missing in organizations (universities).

2.4.1 Meaning of Organizational Learning

As stated by Saadat and Saadat (2016), the introduction of the organizational learning concept for the very first time in the research literature was introduced by Kurt and March. On the other hand, one more research depicts that the evidence-based approach of organizational learning and its introduction was brought out in a study by Cangelosi and Dill (1965). The debate about whether the concept of organizational learning is based upon a change in cognition or behavior was very much compressed in the current era (Hafit, Asmuni, Johan & Othman, 2019;

Odor, 2018, 2019; Easter-Smith, Crossan & Nicolini, 2000) and in the latest literature, the organizational learning engages equally with change in cognition together with behavioral change. In short, it is nearly a collective or common assumption that learning concerns with both cognition and behavior.

The organizational learning is described as the prior knowledge and experience is the foundation of change in the organizational knowledge (Fiol & Lyles, 1985). Learning organization is complicated with many dimensions in approach as the definition of a learning organization is an outcome or result of organizational learning. For this reason, Jones & Hendry (1992) observe that- "organizational learning is a process going on in the learning organizations" (p. 157). Cyert, and March (1963) have reported that knowledge creation, knowledge retention, and knowledge transfer can be established through formal actions and individuals experiences. Furthermore, they can be collectively categorized in organizational learning system.

Organizational learning is a "multilevel process where members individually and collectively acquire knowledge by acting together and reflecting together" (Scott, 2011).The culture of an organization especially a learning organization has a straight forward influence on the performance of the organization, and possibly on the innovativeness of the organization. Accordingly, this paper proposes that learning organization culture has direct effects on organizational performance and organizational innovativeness, having potential to steer the organization to long-standing and continuous success.

2.4.2 Approaches to the Study of Organizational Learning

For the study of organizational learning, two most important approaches are:

1. Cognitive approach
2. Behavioral approach

Day (1994) was a cognitive intellectual (theorist) who described organizational learning as "the process of developing open-minded inquiry and informed interpretation" (p. 89). The debate about cognition depicts the reality that one organization can obtain knowledge with the absence of parallel change in behavior. Organizational learning as per different analysts is the change in the extent of promising behavior (Huber, 1991). As stated by Huber, learning in an organization is only held when an organization and its departments obtain knowledge that proves valuable for the organization. In the view of Scott, organizational learning is defined as the

"acquisition of knowledge through new insights where students learn and develop new cognitive ways or beliefs through belief systems" (p. 3).

According to her, the awareness inside an individual and organization leads to change in perceptions and the behavior will automatically alter with the force of knowledge and learning; so therefore focusing on behavior is irrelevant.

Some researchers focused on a mixed approach (cognitive-behavioral approach) to study organizational learning. These researchers claim that reactions play a very important role in learning with the help of two aspects which are belief system and behavior that clearly depict leaning taking place. Argyis (1977) makes an effort to create a connection between reaction and behavior. According to him, learning is all about discovery and doing things right (Sefidi, 2006). At this point, learning has been considered with a mixed approach.

Alvani (2008) also supported Argyris' viewpoint about organizational learning when he said that organizational learning is "the reason of finding mistakes and gaps and solving and rearranging them" (Senge, 2003). In short, learning is all about change in behavior with correct action.

The viewpoint of Mayo& Lank (1994) shows that learning in an organization involves procedures and methods, and human capital is related to the organizational learning based on set goals. Learning is practical and it needs actions to be taken. "It is about getting the data that we collect to have new knowledge management systems and information through data and then using that knowledge to improve the organization" (Giesecke & McNeil, 2004). Knowledge applicability is the most important part of learning, as mere gathering of information cannot lead to learning therefore known knowledge needs to be implemented in our daily chores.

Pentland (1992) also said that the capacity of an organization is called organizational learning by which an organization acts proficiently. According to some researchers, the quality and uniqueness of outcomes and services (Helfat & Raubitschek, 2000; Helfat & Peteraf, 2003) or existing knowledge (patent) stock (Alcacer & Gittelman, 2006) is used to measure the knowledge in an organization. All in all the existing and new knowledge mutually shape the organization.

The procedure of organizational learning is improved through knowledge and awareness which make actions more refined. Organizational learning is the connection and perception between future and past actions that increase the effectiveness and knowledge of an organization. All in all the existing and new knowledge mutually shape the organization.

Associated with the additional progressive and flexible analysis about organizational learning process are: Cummings and Worley suggested that the process of organizational learning is continuous improvement in knowledge and proficiency that lead towards change. Innovation and performance play the most important role in a learning organization (Power & Waddell, 2004; Watkins & Marsick, 1993, 1996). In the constantly changing environment, there is a challenge for each organization to meet the demand of the world, only that organization will be able to learn perfectly which has the power of constant change and development to meet the challenges (Senge, 1990).

Acquisition of knowledge, sharing of knowledge, and utilization of knowledge open up new dimensions of success and achievements (Gumusluoglu & llsev, 2009). Hence, learning is something practical that needs experiences to shape actions. Only theoretical thinking does not lead to learning.

As stated by Huber, "knowledge acquisition construct consists of five processes: The first is mapped out on the knowledge available at the time of organization's birth. It is foundational learning" (p. 88). Secondly, experience is very important for learning because prior knowledge helps to learn more appropriately. Thirdly, analysis of other organizations and adopting their good learning techniques, called role modeling is also helpful for learning. The fourth is "grafting on to itself parts that know wanted but not used by the organization". Finally, fifth and last, the organizational physical environment is also important for learning so that perceive or seek to find something from it.

Grant identifies that organizational learning competence is a result of refined absorption of knowledge; at this point, creativeness is a source of the organizational competency to control and absorb knowledge applied to numerous individuals and groups.

Accordingly, Morgan recommended that due care should be taken in noting that the structure and process of knowledge absorption of an organization are related to its learning capabilities instead of that the extension of knowledge based on human capital (p. 23). A healthy

environment is much needed for learning to flourish and for this environment; prior knowledge and experiences should not be ignored for better outcomes. The purpose of the above implication about the environment is that learning only flourishes when the members of an organization accept the un-expectable truth about their knowledge and experiences.

The blame culture in an organization damages the learning environment because errors are a common part of learning and accepting errors can change the learning environment of an organization. The errors happen due to carelessness and may be due to lack of planning or insight but in the blame game, the pressure comes to those people whose ideas are real and original.

Originality and creativity are highly appreciable in an organization with a learning environment. For creativity, there is a need to be innovative to discover substitutes without limits but proper planning and risk management required in this process. Trials and errors are part of learning because ideas might not work in the very first attempt. The challenges are not meant for failures, as there is always a need to find new ways to work on them with different possibilities to deal with challenges.

Glynn, Lant & Milliken, (1994) stated in their study that the surrounding of organization influences performance, activities, and resources as the organizational environment is the collection of forces or institutions. In the context of organizational learning, internal and external environments are taken into consideration. The controlled variables such as structure, process, and people are related to the internal environment. The uncontrolled variables such as competitors, customers, political situation, economic affairs, and regulatory agencies are related to the external environment which is helpful for the operations of any organization.

There are many dimensions upon which the environment of an organization depends such as instability, interconnections, generosity, and changeableness. The experience of an organization influences context and affects the internal and external environment.

2.4.3 Dimensions to Organizational Learning

The differences of an individual can be problematic for an organization, and the training given by the management brings about harmony among people and connect them for a common

ground in certain areas. To minimize the differences between managers, many organizations invest energy, and money to bring them on common ground.

"Strong organizations begin with strong organizational cultures". An organization that gradually but strongly establishes its culture (norms and values) of giving guidelines to its employees collectively and produces workers who work unitedly on a common goal by sharing their ideas and knowledge. Salary and payroll is given according to experience, skills and processing of knowledge and information related to good management training (Reilly, 1998).

Every individual in an organization is different from other, and managers should use the strength of every individual and encourage him by giving more opportunities to improve his uniqueness and individuality.

Professional as well as personal development is the part of management development programs and organizations usually spend extraordinary resources on it to develop individuals' personality, knowledge and skills. When knowledge and understanding increases in an individual, self-awareness also increases causing behavioral changes. In short, professional and personal development programs are effective not only for individuals but also for their organizations.

The behavior, knowledge, and skills of employees have their role for organizational development; therefore, organizations chalk out policies and programs to control and develop their employees for better performance (Fajana, 2002). As stated by Bennis (1969); and Beckhard, (1969), the changing organizational culture needs development in the organization to make practical and effective use of knowledge and skills with good behavior as a foundation for intervention whose purpose is to improve an organization's wellbeing and effectiveness. The change in organizational culture is an extremely difficult challenge for leadership because an organization consists of an interlinked set of goals, strategies, norms, methods, and practices. All members of the organization are involved in the organizational development process because the organization focuses on the professional and personal development of every individual. All in all, the way an individual behaves in a group or in individual tasks is related to the study of organizational behavior and the organizational change. Development programs change individuals' personality to react appropriately for the achievement of common goals.

The development programs are based on organizational goals. What type of change an organization requires determines the framework of development programs. The change may be related to minimizing individual differences or using individuals' potentials by encouraging them, or maybe enhancing collaboration and communication between individuals or groups, and or maybe improving the to the performance of the staff.

2.4.4 Benefits of Organizational Learning

Technology innovation, strengthening of the outcome and advancement in the process are all happen due to organizational learning (Gomes & Wohahn, 2017). The advanced competitiveness universal is a remedy for long-run success and development of organization caused by organizational learning. It has been recognized that the relationship between organizational turbulence or trouble and organizational learning is positive as turbulence is unfavorable equity of organizational climate but useful for organizational learning. That means the turbulence increases stress in an organization caused by the change in the outer environment that leads to an increase in the requirement of organizational learning. Organizational learning like water for an organization and without organizational learning there will be scarcity and will not be able to systematize the environment. As stated by Senge, a new approach has been introduced in which both knowledge creation and organizational learning has been involved that help to strengthen organizational performance with continuous improvement. Organizational learning is important for any organization so for adjustment in environmental changes there is a need for organizational learning that leads to increase technological innovation as low level of learning organization unable to accept environmental changes that result of technological innovation. This will continuously bound the potential of the organization to stay competitive and it will direct the organization to an untimely end. The strategic standards of an organization depend upon enhancing "learning organization". The organizations have a conceptual blueprint that describes that structure and operation which helps to remodel the organization towards learning as the organization can build a suitable way to diversify the environment, cited in Ramírez, Morales & Rojas (2011).

2.4.5 Tiers of Organizational Learning

There are three tiers of organizational learning in all organizations:

The individual tier: In individual tier, learning new ideas and know comes from environment, experiences, drawing inferences about them, and after that modifying actions (behavior) accordingly to achieve specific results through rational and cognitive processes.

As stated by Hollingshead, expertise, and sharing of knowledge between members of an organization build hurdles for them to efficiently recognize, recover and transfer knowledge when required. This is also cited in Su, Hung & Contractor's, (2010) study.

The group tier: Sharing and interaction between individuals about their ideas and consequent learning is referred to as tier or group learning. In group learning individuals exchange their ideas with their fellows; they draw inference and reach the same points by discussion. The central point of group learning is communication. Reagans, Argote & Brooks (2005) examined the process of group learning while observing joint-replacement surgeries in training hospitals. They concluded that "increased experience gained through collective work as a team promoted better coordination and teamwork".

Organizational tier: When groups cooperation with each other and exchange their knowledge which they have obtained through joint efforts and communication processes, the learning is transformed into a satisfactory instruction for every member of the organization and it will be approachable to all as per requirement (Amir Kabiri, 2006a, 2006b). Organizational learning focuses on three main factors.

There are three main factors that trigger the study of organizational learning using the it as a unit of analysis. The first is the, knowledge and memory of an organization, which plays important role in the organization by receiving and securing knowledge (Metalfe & Gibbons, 1989a, 1989b). Secondly, in the technological development features of an organization, importance is given to the innermost competencies of individuals and team (Pavitt, 1991; Hamel, 1990). Thirdly, regular practice is needed for proper functioning of the memories of organization and physical foundation of knowledge (Nelson & Winter, 1982a, 1982b; Nelson & Nelson, 2002; Nelson, 1994).

2.4.6 Process of Organizational Learning

There are two basic stages of organizational learning knowledge generation and knowledge application. They are further classified into eight levels.

Knowledge generalization allows recognizing similarities in acquired knowledge in one circumstance and allowing it for transfer of knowledge into a new situation. Knowledge acquisition is possible through trainings, recruitment, intellectual property licensing and benchmarking. Knowledge application refers to an organization's timely response to technological changes by utilizing knowledge and technology developed for new products and processes. Integration (new product development and operations), knowledge sharing (strategic planning and communities of practice), knowledge replication (transfer of best practices and on-job training), knowledge storage and organization (data bases and standard operating practices), knowledge measurement (intellectual capital accounting and competency modeling) and knowledge identification (project review) - all are included in the process of knowledge application.

As stated by Argyris and Schon (p. 323), "organizational effectiveness must be experienced before one can claim that organizational learning has taken place".

Su, et al. while quoting Rulke and Galaskiewicz (2000), made aware that "organizations should not blindly grasp a centralized structure or decline a decentralized structure of knowledge and learning system; at the same time as centralization may depend upon expertise and accessibility for information pursuing, decentralization may facilitate and simplify the allocation and dispersion of detracting information" (p. 592). "Organizational learning is as natural as learning in individuals as they attempt to adjust and survive in an uncertain and competitive world" (Dodgson, 1993).

Table 2.2

Stages of Organizational Learning

Stages	Knowledge creation	Research
Knowledge Generation	Knowledge acquisition	• Training • Recruitment • Intellectual property licensing (IPL) • Benchmarking
Knowledge Application	Knowledge integration	• New product development • Operations
	Knowledge sharing	• Strategic planning • Communities of practice
	Knowledge replication	• Best practices transfer • On-the-job training
	Knowledge storage and organization	• Databases • Standard operating practices
	Knowledge measurement	• Intellectual capital accounting • Competency modeling
	Knowledge identification	• Project reviews

2.4.7 Factors that Contribute to Organizational Learning

The factors that contribute to organizational learning are as follow:

1. Organizational strategy: Re-structuring of the organization after studying about errors.

2. Resource proportion: Research and proper utilization of resources.

3. Encouraging the employees and recognizing their efforts.

Hashemi acknowledged the following nine key determinants that influence organizational learning:

1. Systems thinking: Competence or expertise to engage in critical thinking in a complicated system.

2. Collaborative learning: The factor needs the formation of a team or group with a common task under the same environment and procedure.

3. Mental models: The brainwork of people about how things are working around in the natural world.

4. Ideal and vision commons: Organizational learning is a process that broadens the vision by sharing knowledge that reaches a common vision, and through the strategy, the organization sooner or later attains the ideal approach of a learning organization.

5. Skill and domination personals: Employees have personal and professional skills, and follow the rules and regulations in disciplinary manners.

6. Experimenting with new approaches: Coming up with different and unique ideas and applying them practically.

7. Learn from past experiences: Learning from past experiences increases expertise because an employee does learn from trials and error.

8. Learning from others: learning forms others' exposure also increases learning as everyone has a unique mind and ideas.

9. Knowledge transfer: Dispersing of knowledge from one organization (team, individual) to another.

"Learning is the relationship between people".

For effectual learning, the organizational leader plays a very important role in it as shown in different research studies. Knowledge for an organizational leader is a valuable good and likely to have a positive impact on organizational learning. Uninterrupted innovation and progression in an organization require learning laboratories for sharing, gaining, creating, and using knowledge-based recourses; all these processes need the whole team to work in cooperation for the organization.

In addition, an important thing in the organizational learning is that the moribund methods of thinking should possibly be reviewed. It is not a surprise that Argyris noted about the double-loop learning model that has been used in organizations for objective evaluations.

As per the thoughts of Argyis, problems and inconsistencies are likely to occur in extra progressive and flourishing systems; intrinsic and deep-rooted issues would take a long time to be fixed within the initial periods of development. Likewise, West and Burnes (2000) argued that even though the competitiveness of an organization builds up with the help of organizational learning but the success of the organization may not be assured.

Khanekar & Sharma (2006) stated in their study that the progress and performance of an organization are largely based on operations of Human Resources Management (HRM). Human Resource Development is the part of organizational learning and the correlation between performance and HRM has been significant and positive. Dunphy & Griffths (1998, 2003), supports the above discussion and stated in their study that progress, acquirement and relative advantages make their way to the organization only with organizational learning.

2.4.8 The Concept of Learning Organization

The experienced and skilled organization keep on creating, obtaining, and sharing knowledge with an aim to continuously change its employee's behavior according to the new and fresh knowledge about learning organizations (Garwin, 1993). In the field of management sciences, learning organization is a pretty new idea and it is a kind of perfect form that the ensures the promotion and facilitation of learning in the members of the organization (Hussein, Mohamad, Noordin & Ishak, 2014).

The idea of learning organization was firstly presented by Peter Senge (1990) and also mentioned in Yadav & Agarwal's (2016) research study. Yadav & Agarwal (2016) stated that Peter Senge has been designated as a senior lecturer at MIT and gave instructions on sustained leadership with the originator of the organizational learning society. According to Senge learning organization is defined, as "an organization that encourages and facilitates learning to continually transform itself to survive and excel in a rapidly changing business environment".

Learning and tasks in the workplace are unified continuously and systematically in learning organizations with the purpose of organizational enhancement. The entire organizational enhancement process indicate that the employees in the organization observe learning as an endless and constant operation with practical experience.

Griego, Geroy & Wright (2000) described learning organization as "an organization that sought for transformation and excellence through interrupted and continuous organizational renewal and gradually mastering the subject matter". Learning about individual differences is important for building up a learning organization because everyone has a different mindset that behaves in a specific way; thus ignoring particular sets of behavior is not encouraging for obtaining knowledge and experience.

2.4.9 Characteristics of Learning Organization

According to Sery,

1. In a learning organization, there is a smooth transformation of information in the entire organizational structure.

2. All four-levels (individual, teams, workgroups, and organizational level) learn everything at the same time.

3. There is an intelligent vision and planning of learning organization for its growth as well as development and employee's personal and professional development.

4. Learning organization act as a meta-thinking body that focuses on people, management, and organization. The learning organizations are comparatively different from other organizations in terms of systems, resources (human, material), culture, and structure.

   - Organizational structure of learning organizations: With managerial hierarchies the learning organizations provide opportunities to their employees to motivate them.

   - Culture of learning organizations: The powerful culture of an organization is exhibited in the transformation of knowledge with transparency and creativity within organizational employees: encouragement for obtaining and transferring knowledge: and accepting innovations to try a new idea practically and learn from failures and mistakes.

   - Information system: It is the main requirement of a learning organization as information system enhances and promotes practices. With information system, a learning organization is distinguished from traditional organizations because the latter use information only for command functions.

- Human resource development: Personal and professional development of employees is an important part of a learning organization. It enhances the skill and performance of employees in the long run. The appraisal system of the organization keeps reviewing the performance of its human resource. Human resource development encourages acquisition and transfer of new and fresh knowledge and experience.

Additionally, learning from practice is a basic function of a learning organization. Learning organization not just supports the practical implementation of knowledge but also promotes complex learning. In a learning organization, new knowledge continuously adds up in knowledge assets and used by individuals for performance enhancement. In the process of learning, mistakes are considered a form of learning and experience instead of a source of disappointment. From this learning and experience; individuals strengthen themselves and work for improved efficiency of the organization.

"Learning organization have a competitive advantage because they have brand equity which their competitors don't have, and they attract and retain the best talent" [47].

2.4.11 Precise Difference between Organizational Learning and Learning Organization

The two concepts (organizational learning and learning organizations) are different from each other. The ideal condition of the learning organization is because of organizational learning as all learning organization have organizational learning structure which is the element of the culture of an organization. "A learning organization helps to enhance organizational learning by creating structures, strategic fittings, and strategic crafting".

With innovative technologies, organizations learn continuously and enhance their knowledge assets to deal with future challenges. The developed learning organizations need to manage their assets by managers and they must ensure that learning should be constant and continuous without interruption. The learning process must be increased continuously and uninterruptedly. Sometimes organizations discontinue learning process whenever they are on the track to success and the discontinuity of the learning process is the main reason for the failure of the most organizations.

Initially, organizations are flexible to change readily learn but as they reach the initial stages of success and expansion level, the flexibility decreases due to rigidity and the energy

enthusiasm for learning also reduces. The initial achievement brings about disappointing conditions in the organization because of the feeling of accomplishment and havig no urge to learn something new. People in such organizations are in restless conditions and wait for chances of switching to other organizations with conducive environment. They miss several new opportunities due to an unsustainable environment. Before the realization of the gravity of the situation the competitors grab their opportunities and take advantages of the downfall of such an organization.

Deep-rooted learning is based on philosophy, central values and organizational culture. Deep-rooted learning makes an organization able to face unusual unseen situations. Additionally, for effective double-loop learning, leaders of an organization need to realize the worth of learning. Learning in an organization is the universal remedy for organizational durability.

Finally, leaders of an organization must shift their role from traditional to more innovative and broader cross-functional role in order to promote productive dialogue, idea implementation, and experimentation that produce competitive environment for knowledge creation activities.

2.5 Organizational Resources View

Shifting in thought is more preferable in knowledge management to present innovative theory or concept (Conner & Prahalad, 2002) as Grant, 2002 said that the continuous progress in knowledge creation decreases the existence of knowledge from the long run to the short run. In an organization, knowledge management is connected with a knowledge-based view.

There are two basic types of organizational views.

1. Resource-based views

2. Knowledge-based views

2.5.1 Difference between Resource-based View and Knowledge-based View

In the mid of 20th century, Penrose worked on a resource-based view with a group of resources (human and physical) that are proved productive for the organization. The material resources and knowledge resources can deliver various services and can also serve different purposes according to the organizational goals. In this connection, human capital (knowledge

and skill that held by people) and physical capital (non-human resources used to get services) have been closely related to each other. On the other hand, the conceptual change in the economy from material to knowledge increases the re-appraisal of employees in organizations.

1. The resource-based view (RBV): Knowledge in resource-based view is noticed as a common resource that along with other resources provides relative advantages in some ways (Barney, 1991; Penrose, 1959; Grant, 199; Curado, 2006. Resource-based theorists acknowledged the value of knowledge but these theorists also believe that other resources are also important, rare and, non-replaceable (Barney, 1991; Curado, 2006).

2. Knowledge-based view (KBV): According to knowledge-based philosophers, knowledge resource is an extremely strategic form of the resource for an organization. It is difficult to express KBV with social complexities as it is not stationary but divergent that the gives continuous and prolonged relative advantages. The human capital in form of tacit knowledge yields relative advantages for the organization but due to implicit properties, causal ambiguity always stays around (Penrose, 1959; Spender, 1996; Hoops & Postrel, 1991; Curado, 2006). As per current ideas organizational learning plays an important part in the sustainability of relative advantages. Most of the parts of knowledge-based view are based on intangible and stationary resources (Curado, 2006).

2.5.2 Shifting from resource-based view to knowledge-based view

It is greatly acknowledged that the current expansion in resource-based view is a knowledge-based view of the organization (Curado, 2006). To develop resource-based view, knowledge plays a vital role being an extremely essential strategic resource (De Carolis, 2002; Curado, 2006).

The knowledge-based view is recognized to be compatible with present economic conditions (Grant, 2002; Curado, 2006) also Ducker, 1993 added that the knowledge society is essential to revive economy of a country. Garud & Kumaraswamy, 2002 said that human capital is important for organizations (Y Jin, 2010) and competitive advantages can be gained with the help of skilled employees. The organizational workforce involvement with skilled and experienced insight increases its progress in the long-run (Guthrie, 2001). So previous discussion shows that intangible assets are exceptionally appreciated. Bontis et al., 1999 said that the intellectual capital is the essence of knowledge society. Petrick et al., 1999 further mentioned

that intangible resources are more reliable than tangible resources. Eustace, 2000 has additionally explained that in the 21st century, world economies are more focused to invest in human capital instead of physical capital. In short, the shifting trend from physical to human capital has increased the competitive advantages among organizations and economies.

Knowledge is executed in an organization as a resource so that the connection between knowledge-based view and resource-based view is formulated (Airely, 2003; Curado, 2006). The resource-based view is continuously developed worldwide due to the strong knowledge-based view (Curado, 2006). The special quality of intangible resources (particularly knowledge) has a research approach so organizations now a days concentrate more on knowledge assets (Rouse & Daellenbach, 2002; Curado, 2006). Knowledge resources provide a sustainable relative advantage to an organization but the reproduction of knowledge resources is a little difficult (Wiklund & Shepherd, 2003; Curado, 2006) as knowledge is preserved in human beings in the form of tacit knowledge with different behaviors and actions.

Higher education institutions all over the world have acknowledged the value of knowledge particularly with the advent of a new trend that encouraged transition from industrial to human capital form. The productive pattern in an organization has been changed with the increasing importance of knowledge (Carneiro, 2003; Fulk and DeSanctics, 1995)

2.5.3 Knowledge based view

The conceptual change in the economy from material to knowledge increases the re-appraisal of employees in organizations. Creative employees hold central importance in organizational functions. Other employees are viewed to be in the marginal line with the continuous change in responsibilities (Child & McGrath, 2001).

The efficiency in behavior is a demand of many organizations working on the philosophy of knowledge-based view. In spite of this, only a few organizations understand the meaning of this conceptual change (Zack, 2003).

Stable learning environment and a positive approach towards culture in an organization are the main perspectives of knowledge-based view (Balogun & Jenkins, 2003). Organizations with a cultural approach learn from cultural artifacts. As Curado, 2006 with reference to Cook & Yanow, 1995 stated that "organizational learning allows firms to acquire, to change and to

preserve its organizational capabilities". Culture is most frequently described by Schein (Schein, 1985) "as a well of assumed beliefs held in common by members through sharing of an institution, or as shared knowledge and beliefs" (Nonaka and Takeuchi, 1995) Balogun & Jenkins, 2003 said in their research that the generation of knowledge needs continuous change and improve knowledge activities with tacit knowledge (skills and experience).

Curado, 2006 with reference of Balogun and Jenkins, 2003 stated that "organizational culture is, in each scenario, the stock of knowledge and belief, coded or not. It is integrated into patterns and recipes of actions taken before many situations. Time and procedures make knowledge tacit, equal and an important drive for action." According to Curado, 2006 with reference to Winter, 2003 "a routine consists of learned behavior which is highly structured, repeated and founded, even if only partly, in tacit knowledge."

2.6 Knowledge Management

In the current era, knowledge is broadly acknowledged as the main fundamental competitive advantage for any organization (Palacios & Garrigos, 2006). Knowledge introduces conceptual mastery of a subject. Knowledge management has appeared as an exceptionally familiar term in the last two decades, as it has a wide range of functional exercises in different areas with the purpose of organizing, creating, and embellishing intellectual assets (Shannak, 2009). And it has turned out to be beneficial with immense abundance of support and participation from many researchers and a large-scale aggregation of experiences. Form core thoughts, KM should be a sort of usable mechanism and ideology (philosophy). KM is a component of management studies, but it is also directly consolidated with communication and information technologies (IT) (Mihalca *et al.*, 2008). KM can be monitored from numerous angles, as there are a lot of fields that promote it. Noticeable fields are social science, management science, business and economics, philosophy, and psychology (Kakabadse *et al.*, 2003).

2.6.1 Definition of Knowledge Management

Here are multiple ways to develop knowledge understanding, both in abstract and complex terms. In the field of epistemology, the description of knowledge in the current discussion is between philosophers and researchers. Among the most acknowledged description of knowledge is a progressive human capital that needs philosophy to achieve the facts (Nonaka,

1994). It considers knowledge an asset that is non-material and intangible whose attainment occurs with complicated cognitive procedures of insight, learning, dissemination of information, connection, and reasoning (Epetimehin and Ekundayo, 2011).

Knowledge is the idea, capability, experience, and insight that provide a platform for creation, valuation, and utilization of information (Soltani & Navimipour, 2016). Commonly, two types of knowledge exist: explicit and tacit (Hubert, 1996). Tacit knowledge is personalized with customized qualities and contextual knowledge that resides in the mind, actions, and insights of human beings (Duffy, 2000). Koenig (2012) indicated that explicit knowledge is expressive knowledge available in intangible form.

There are many other explanations and definitions about knowledge management defined in various schools of thought. These descriptions of knowledge management are somewhat ambiguous and have many directions indicating different author's insights. For an in-depth understanding of Knowledge management, we should re-analyze the basics of knowledge management, such as deep conceptualization of the term of knowledge. It is analyzed that an important conception of knowledge management. There may be various terms that seem more concise and comprehensive than the rest; for example, information and organization. Therefore, despite different variations in definitions and explanations about knowledge management, the common point among these definitions is learning efficacy within individuals and the involvement of intangible resources to increase relative advantages. The efficiency of knowledge management is the ability to give the instruments and tactics to get fresh information for progressive learning environment and enhancing relative advantage.

2.6.2 Process and Tiers of Knowledge Management

Knowledge management is a process with the formation of many activities performed for major components of application and strategy for knowledge management. In the past two decades, various procedures of KM have been introduced in many research studies with several points of view. In these studies, the researchers revised and summarized major areas of knowledge management process. Even though there exist a variety of explanations about KM process, some terms look more important and necessary than others do such as transfer, creation, storage and application.

Creating knowledge means the ways new and fresh knowledge is created. This phenomenon includes the development of a new concept or the replacement of the existing concept within explicit and tacit knowledge (Ajmal & Koskinen, 2008). Storage of knowledge means the cycle of saving knowledge and transferring it in the stock such as files, information base and archive systems with an aim to transmit the knowledge to the designated persons, teams, or units that need to execute it (Johannsen, 2000). Knowledge transmission is a procedure that is necessary for knowledge management and helps transformation of knowledge to the areas where it is lacking and can be reused (Pirkkalainen & Pawlowski, 2013). This stage is crucial for the achievement of the procedure of knowledge management; it transforms and includes modification in the knowledge base (Argote & Ingram, 2000). Knowledge implication or execution means the realization of knowledge. This process can be used to invent new tactical direction; to overcome new issues and problems; and enhance efficiency with cost-effectiveness (Newell *et al.*, 2004). At this phase, practice makes effective utilization of the created knowledge by executing it.

2.6.3 Knowledge Management and Organizational Resources View

Knowledge management is connected to the creation of the most fruitful and profitable knowledge which already exists in an organization or intellectual capital. This shows that tacit knowledge initially exists in the human capital of an organization as intellectual capital. Intellectual capital comprises "human, structural, customer, relational and social forms of capital" (Bontis, 2002; Decarolis, 2002; Nahapiet & Ghoshal, 2002). Organizational knowledge is related to intellectual capital that can be rooted in humans, procedures, technical types of equipment, and others. Boisot (2002) said that knowledge management "from an intellectual capital point of view is about capture, storage, and recovery of knowledge existing in the minds of employees, leaders, outside collaborators, or even documents" (p.69)

The first thing is to be clear about the fundamental meaning of knowledge. The most related concept connected to the knowledge is data and information. Both concepts somehow create confusion. The precise and understandable differences between these are given below:

Data: Data comes from the world. Data creates different and various perceptions. Only necessary perceptions are carried out.

Information: Information plays a middle role in between data and knowledge. When data changes into information, it modifies the agent's expectations in a particular way.

Knowledge: Knowledge comes from agents. Specific, relevant and up-to-date information executed by agents is called knowledge.

In another way, a small quantity of relevant data is required by agents in the form of information that can become knowledge when executed. Therefore to convert data into knowledge, agents take data and pick up relevant information for use. This usage of information is called knowledge.

The main purpose of the literature about knowledge management is that knowledge creation is part of knowledge management. So first we have to discuss the root of knowledge creation and then move toward knowledge creation in an organization.

Organizational learning is one of the most appropriate theories of organization within the KM area; the related literature is briefly discussed in section 2.3.

Shifting in thought is more preferable in knowledge management to present innovative theory or concept (Conner & Prahalad, 2002; Grant, 2002). In an organization, knowledge management is connected with a knowledge-based view.

There are two basic types of organizational views.

In the mid of 20th century, Penrose worked on a resource-based view with a group of resources (human and physical) that proved productive for the organization. The material resources and knowledge resources can deliver various services and can also serve different purposes according to the organizational goals. In this connection, human capital (knowledge and skill held by people) and physical capital (non-human resources used to get services) have been closely related to each other. On the other hand, the conceptual change in the economy from material to knowledge increases the re-appraisal of employees in organizations.

Knowledge-based views: The conceptual change in the economy from material to knowledge increases the re-appraisal of employees in organizations. Creative employees are the central part of organization functions. Other employees are viewed to be in the marginal line with the continuous change in responsibilities (Child & McGrath, 2001).

Difference between resource-based view and knowledge-based view: Knowledge in resource-based view is noticed as a common resource that collectively with other resources provides relative advantages in some ways and shows in skills and abilities with the strategically use (Barney, 1991; Penrose, 1959; Grant, 199; Curado, 2006. Resource-based theorists acknowledged the value of knowledge but in view of these theorists, the other resources are also important, rare, and non-replaceable (Barney, 1991; Curado, 2006). In views of knowledge-based philosophers, the knowledge resource is an extremely strategic form of the resource among others for an organization that is difficult to express with social complexities and stationary but divergent apart from that knowledge gives continuous and prolong relative advantages. With the human capital that is in form of tacit knowledge when shared the relative advantages obtained by an organization but due to knowledge has implicit properties the causal ambiguity always around (Penrose, 1959; Spender, 1996; Hoops & Postrel, 1991; Curado, 2006). The current ideas stated that organizational learning plays an important part in the sustainability of relative advantages. Most of the parts of the knowledge-based view are based on intangible and stationary resources (Curado, 2006).

From resource-based view to knowledge-based view: It is greatly acknowledged that the current expansion in resource-based view is the knowledge-based view of the organization (Grant, 1996; Roos, 1998; Hoskisson et al., 1999; Sveiby, 2001; Bontis, 2002; De Carolis, 2002; Huizing & Bouman, 2002; Balogun & Jenkins, 2003; Curado, 2006). In order to develop in resource-based view, knowledge plays a vital role as knowledge an extremely essential strategic resource (De Carolis, 2002; Curado, 2006).

The knowledge-based view is recognized as sufficient to the present economic condition (Drucker, 1993; Sirois, 1999; Stewart, 1997; Garud &Kumaraswamy, 2002; Grant, 2002; Guthrie, 2001; Mathews, 2003; Curado, 2006). All the previous discussions showed that the intangible assets are exceptionally appreciated (Bontis et al., 1999; Petrick et al., 1999; Eustace, 2000; Barney, 2001; Hitt et al., 2001; Grant, 2002; Mathews, 2003; Curado, 2006).

The knowledge is executed in an organization as a resource so that the connection between the knowledge-based view and the resource-based view is formulated (Airely, 2003; Curado, 2006). The resource-based view continuously developed worldwide due to the strong knowledge-based view (Roos et al., 1997; Stewart. 1997; Sveiby, 2001; Marr, 2004; Curado,

2006). The special quality of intangible resources (particularly knowledge) has a research approach so the organizations now a day's more concentrate on knowledge assets (Rouse & Daellenbach, 2002; Curado, 2006). The knowledge resources provide a sustainable relative advantage to an organization but the reproduction of knowledge resources are little difficult (Wiklund & Shepherd, 2003; Curado, 2006) as knowledge preserve in human in form of tacit knowledge with different behavior and action.

Worldwide Higher education institutions acknowledged the value of knowledge and with the emerging trend in economies from industrial to human capital from last few decades. The productive pattern in an organization has been changed with the increasing importance of knowledge (Carneiro, 2003; Fulk and DeSanctics, 1995).

The conceptual change in the economy from material to knowledge increases the re-appraisal of employees in organizations. Creative employees hold central importance in organizational functions. Other employees are viewed to be in the marginal line with the continuous change in responsibilities (Child & McGrath, 2001).

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Curado, 2006 with reference of Balogun and Jenkins, 2003 stated that "organizational culture is, in each scenario, the stock of knowledge and belief, coded or not. It is integrated into patterns and recipes of actions taken before many situations. Time and procedures make knowledge tacit, equal and an important drive for action." According to Curado, 2006 with

reference to Winter, 2003 "a routine consists of learned behavior which is highly structured, repeated and founded, even if only partly, in tacit knowledge."

2.6.4 Justification for Knowledge Management

Currently, we are living in the age of knowledge. The cause of multiplied status of knowledge is based on the fact that effectual knowledge management returns optimistic outcomes to enhance learning ability. The implementation of KM is an initiative with the strong urge for higher competitive advantages. KM is employed to obtain, keep a record, preserve and reuse knowledge. KM also includes knowledge creation, knowledge circulation, and knowledge reciprocation (Dayan & Evans, 2006). The implementation of KM is unlimited; it can range from personal (individual) learning to large organizational learning. Over the year, it has evolved essential for individuals making them realize what sort of information is relevant and valuable; how to manage and control this relevant and valuable information; and how to convert this information into deep-rooted knowledge (Tseng *et al.*, 2012) so as organizational operations and strategies equally require the basis of knowledge management to keep organizational learning prominent (Castrogiovanni *et al.*, 2016). In short, knowledge management is required for both individuals and organizations to reap the benefits of knowledge.

Over the previous decennium, many publications concerning KM have examined various points of view. Ragab and Arisha (2013) classified several twigs of KM analysis. Serenko (2013) examined the storage of KM publications and detected citation standards in the KM area. Makhsousi *et al.* (2013) examined the latest developments on the execution of KM in several fields and reviewed why and wherefore few KM executions collapse and the way they could return to productivity. Arisha & Ragab (2013) presented a review of the literature and grouped the analysis of the speedily increasing quantity of KM publications, and they proposed a thorough reference for beginners starting analyses in this specific field. Matayong & Mahmood (2013) examined the present studies on KM systematized research studies in organizations. Chiliban *et al.* (2014) analyzed various KM designs and explored their pros and cons. Tzortzaki & Mihiotis (2014) contemplated how the theory spinning around all directions of KM has been designed over several years. Omotayo (2015) discussed the studies in the field of KM to bring to light the necessity of KM in an organization. Asrar-ul-Haq & Anwar (2016) studied the efforts to deliver authentic knowledge sharing through knowledge management in organizational terrain.

2.6.5 Approaches Designed for Knowledge Management

The approaches for knowledge management are as follow:

1. **Knowledge representation and organization**

Knowledge design and representation is a strategy that adds effectiveness to the explanation between associations of knowledge organization with the reason of arranging knowledge by bringing similar relations between different contents. In the last few decades, the network has been introduced called semantic link network (SLN) which is extremely utilized in the area of knowledge management. This network (SLN) is a system that represents relations having semantic nature among different areas that can be used to indicate knowledge. It indicates the areas and ideas of semantic nature in the relation between several ideas and concepts that comprise vertices (Hai, 2011).

Kravchenko *et al.* (2017) introduced a common semantic approach with a fresh and innovative way to find a solution to knowledge management problems. For the semantic common approach, Kravchenko et al. (2017) organized the known algorithm in compliance with the knowledge model graph. For the semantic representation with interpretation, Xiao *et al.* (2016) suggested a new approach called semantic representation of knowledge that explicitly utilizes knowledge. A knowledge management model based on the semantic approach strengthens collective learning context presented by Che Cob *et al.* (2016). To enhance knowledge management, Cob *et al.* (2015) considered the execution application of SLN with the assistance of collective learning context. The web-enabled settings are popular in the current era because the semantic-based knowledge management forum along with the conceptual information is useful for web-enabled environment Liu *et al.* (2014).

Among the executing application of KM with SLN, the ontology-based approach is used worldwide and it has come from philosophy, where it considers a semantic interpretation of ontology catalog of new concepts in an area, which indicate predicates, systematic beliefs, and concepts with their relation to each other (Natalya *et al.*, 2001). Ontology is a wide executing application that has potential in the categorization of information with the creation of knowledge through databases along with research and development ac last few decades the researchers widely concerned about the executing application of ontology that is helpful in the area of knowledge management.

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2. Knowledge sharing

One of the main concerns in knowledge management is how to develop new knowledge and how to share it with others. In fact, effectual knowledge management depends on prosperous sharing of knowledge (Swacha, 2015). Knowledge sharing is described as "the switching and exchanging of knowledge between and among individuals." Its goal is creating knowledge resources collectively and interpreting them into fresh and modern knowledge infrastructures or routines. Sharing of knowledge and transfer of knowledge are sometimes used interchangeably and indistinguishably or deemed to have doubling materials (Dan and Sunesson, 2012). According to majority of research studies and definitions, knowledge sharing is semantically equivalent to knowledge transfer (Paulin and Suneson, 2012). The accomplishment of knowledge sharing depends upon the level where knowledge is re-created in the recipient.

Swacha (2015) described a process of suitable game rules through which a gaming component is intentionally chosen to develop individuals' interest and to motivate them to perform several knowledge sharing activities. Yong (2013) indicated a new area in accordance with rewarding, mutuality, satisfaction and social capabilities of individuals' intentions of knowledge sharing which has been denied till now. Their results and findings are helpful to strengthen and broaden the understanding of researchers for the analysis of the role of motivation and social capabilities in individuals regarding knowledge sharing activities. Ma and Yuen (2011) suggested a web-based program that is helpful for knowledge sharing activities and evaluates students in online learning atmosphere. This web-based learning program has two areas: the first one is "perceived online attachment motivation" and the second is "perceived online relationship commitment". Hung *et al.* (2011) studied team collaborations for knowledge sharing effectiveness through extrinsic motivation and intrinsic motivation. The built-in appraisal system with quality feedback in knowledge management is supportive for knowledge sharing activities as showed in the results of Hung *et al.'s* (2011) research study. Tohidinia and Mosakhani (2010) suggested that the systematic support system to knowledge sharing behavior in organizations and also analyzed the various feasible components of individual's behavior of knowledge sharing. The support system includes appropriate components used to motivate individuals by considering different perspectives.

3. Performance measure for knowledge management

Measurement of performance is necessary for knowledge management activities in an organization (Wang *et al.*, 2015). Through the process of performance measurement, the current knowledge management situation can be evaluated. The performance measurement of knowledge management consists of knowledge management practices, appropriate learning environment, fulfillment of learning needs, and feedback about the ongoing improvement in organization. The appraisal criteria are prepared with the help of suitable appraisal methods included in knowledge management performance evaluation activities (Wang and Zheng, 2010). The knowledge management performance evaluation activities work in two categories: the first one is quantitative evaluation while the second one is qualitative analysis. In quantitative analysis, financial and non-financial indicators are used to measure the explicit knowledge because quantitative evaluation has always been related to explicit knowledge (Chen and Chen, 2005). On the other hand, open-ended questionnaires (Changchit *et al.*, 2001), surveys and case studies (Darroch and McNaughton, 2002) and expert interviews (Booker *et al.*, 2008) are commonly used approaches for qualitative evaluation.

Wang *et al.* (2016) suggested four elements of knowledge management index system – these elements are: first, the procedure of knowledge management; second, the structure of knowledge in organization; third, the efficiency; fourth, the economic advantages. The sources of knowledge, process of knowledge management and variables that influence knowledge management are the three classifications of performance appraisal system as suggested by Wang *et al.* (2015). For the performance appraisal of knowledge management, Zhang, 2010 implemented assessment grid and based on a checklist of assessment grid of knowledge management, a complete and in-depth analysis is conducted to assess four aspects related to knowledge management tools: first, monetary aspects second, aspects related to consumers; third internal operations; and fourth, learning and development. Wang and Zheng (2010) have proposed the method of knowledge management evaluation, and this evaluation method consists of knowledge system, structure capital, cognitive or intellectual capital (human capital) and market capital. Based on major elements of knowledge management analysis, Wu *et al.* (2009) established the evaluation method of knowledge management effectiveness along with measuring indicators like stocks of knowledge, sophistication level of a leaning organization, management of information and promotion of capabilities. The categorization matrix was

proposed by Tseng (2008) that classifies indicators of performance for performance appraisal of knowledge management. The possibility of using categorization matrix appraisal includes knowledge management process, human capital and information technology.

2.7 Knowledge and Knowledge Creation

The idea to spend in human resources through knowledge is stem from Adam smith who has significance contribution in creation of knowledge which is useful for an economic growth and development (Smith, 1937, 2010; Shaikh & Tonak, 1996) because Adam smith had great insight and analytical thinking that enlighten academic practices (Buckley, 2014). Further Smith clearly explains, knowledge and skills is not only increase by effective deployment but also through brushing up in specific area. Kenny, 1989; Kremer, 2017 stated in their studies on Gilbert Ryle's, 1984, 1949 research about knowledge that knowledge-that (tacit knowledge) mostly rely upon knowledge-how (explicit knowledge). All in all intelligence (tacit knowledge) change in performance through action (explicit knowledge).

1. Knowledge that … tacit knowledge (intelligence)

2. Knowledge how … explicit knowledge (action)

Friedrich (Hayek, 1937a, 1937b; Hayek, 1945; Hayek, 1989; Hayek, 2012a, 2012b) highlight the knowledge based economy is the formation and sharing of knowledge and information through infrastructure and organizations for development of productivity within country and organizations to increase economic growth.

Schumpeterian (1911, 1912, 1947, 2006 and 2017) said that learning something new to the society is called innovation. The ideas of Schumpeterian of innovation are followed by the Galbraith, Goodwin and Hirschman which is based on economic dynamics (Scherer, 1988; Galbraith, 1973, 1977, 1978a, 1978b; Goodwin, 1990; Goodwin & Punzo, 2019; Punzo, 2006; Petrecolla & Hirschman, 1989; Hirschman, 1958a; 1958b; Hirschman & Lindblom, 1962). Rogers (1962) said that the idea which received by human resources is called innovation and Couros, 2015 said that the good ideas come from the way of thinking. According to Dorenbosch, Engen & Verhagen, 2005; Dorenbosch, 2005; Gupta & Singhal, 1993; Gupta, 1993 that human capital generate through professional and personal activities in organization that helpful in behavioral activities i.e., problem acknowledgement and idea creation and idea screening

(Toubia & Florès, 2007; Schulze, Indulska, Geiger & Korthaus, 2012; Luo & Toubia, 2015; Hammedi, van Riel & Sasovova, 2011a, 2011b; Van Riel, Semeijn, Hammedi & Henseler, 2011). All these behavioral activities mentioned below:

Acknowledgement of a problem: Hunches about the issue in organization that leads towards its solution (Ellis & Levy, 2008, 2009; Greiner, 1989; Greiner & Bhambri, 1989; Schenk & Guittard, 2011).

Idea creation: Generate list of ideas that being used for targeted the specific solution by selection of idea crux (Heinonen, J., Hytti, U., & Stenholm, P. 2011; Matlay, 2011; Tschang & Szczypula, 2006; Witell, Kristensson, Gustafsson & Löfgren, 2011; Su, 2009).

Idea screening: Idea screening is about relevance for an organization whether an idea is competitive, profitable (return on investment), productive (in progressive way) and based on world trend (market demand) (Onarheim & Christensen, 2012; Magnusson, Netz & Wästlund, 2014; Magnusson, Wästlund & Netz, 2016; Kamp & Koen, 2009; Hammedi, van Riel & Sasovova, 2011; Toubia & Florès, 2007).

 Romer, 1986, 1994, 1988; Grossman & Helpman, 1994 are economist whose works on the long-term economic growth and development by developing new theories and ideas (innovations) with the help of spending in physical capital (Arrow, 1962a, 1962b; Romer, 1986; Grossman & Helpman, 1994)especially in human capital (Lucas, 1988, Romer 1986; Grossman & Helpman, 1994) that accelerate the organizational production and performance as well as provide support in competitive environment (Jones & Manuelli, 1990; Grossman & Helpman, 1994). The luxuries lifestyle in societies relies on the advancement of technology which is possible only with the help of great ideas and their implementation (Schumpeter, 1934; Solow, 1970; Schumpeter & Redvers, 1934). The neo-classical production function explain that the diminishing in return added more capital in an economy , an effect which may be offset, however, by the flow of new technology (Solow, 1956; Samuelson & Solow, 1956; Grossman & Helpman, 1994). The growth of economy occurs when innovations and technologies are introduced and economy follows the current trend of world to compete other economies (Pack & Westphal, 1986; Evenson & Westphal, 1995; Pack & Nelson, 1999). The economies which are based on knowledge can increase the returns on investment (Pack & Nelson, 1999; Knight, 1944). A country which stand on human capital (knowledge) work more effectively and the

innovations and technologies lead to improve product and services (Becker, 1962a, 1962b; Schultz, 1961a, 1961b). After that the possibility of long term growth and federal direct investment rises (Pack & Nelson, 1999; Knight, 1944; Solow, 1970; Solow, 1956; and Becker, 1962a, 1962b). The ideas which is based on knowledge used by different firm, organization and institution of a country with little cost and good outcome (Cass, 1956; Solow, 1970; Solow, 1956; and Pack & Westphal, 1986).

Saxton, 2000; Blundell, Dearden, Meghir, & Sianesi, 1999 said that Investment in education and training, research and development, and the structure of organization or institution help develop new technologies (Goldin & Katz, 2009a, 2009b) that raise the productivity of resources. Researches on economic growth give idea about that in the 20th century human resource has been the factor of production and the rate of return on education and training has not been reduced (Abramowitz, 1989; Urquhart, 1990). Spending in knowledge and skills leads to increase the return (Katz, 1999a, 1999b; Oblinger & Katz, 1999). These conclusions argue the change in neo-classical model from use of physical resource of production to human resource (Grossman & Helpman, 1994). The knowledge integration in normal economic production function is not a simple work as some kind of knowledge reproduced and spread easily and at low cost but some kinds of knowledge cannot be easily transfer without linkage with networks, spending in significance capital, and transform codification into information (Fisher, Dwyer & Yocam, 1996; Selwyn, 2011, 2016; Fisher & Dwyer, 1996 and De Ferranti, et al. 2003).

In the history of civilization attention towards information and knowledge are increasing fast than previous history of human civilization. According to Herbert Simon (1999) that the description of knowing have been transferred from memorization of knowledge and to use of information in appropriate way to get something productive from it. We all do talk about knowledge frequently. There are several stages of knowledge that leads us to know better about what is knowledge? Epistemologists considered these possible kinds of knowledge.

1. Knowing by acquaintance: The direct association with a person or thing (personal experience by use of own sense) and secondly indirect experience that make description in mind about that person or thing (Bertrand Russell, 1959, 2013; Fang & Brower, 1959). He further said which quoted by (Jakobson, 1959) "no one can understand the word "cheese' unless he has a nonlinguistic acquaintance with cheese."

2. Knowing that: The knowledge about the facts and truths are called knowledge that e.g., knowledge that 2x 2 = 4, knowledge that water is colorless. No matter the facts and truths could not be changed (Fantl, 2008; Sosa, Kim, Fantl & McGrath, 2008; Cohen & Squire, 1980; Ryle, 1945a, 1945b; Snowdon, 2004; Seldon & Snowdon, 2004).

3. Knowing wh: Knowing-wh wide ranging thinking procedures to communicate and think. Epistemic acceptance "if it were true, I would know it" (De Cornulier, 1988).

a. Knowledge whether: knowing that whether a opinion or judgment is true or false e.g., whether it is good to go on vacation. (Hart, Heifetz & Samet, 1996; Fan, Wang & Van Ditmarsch, 2015; Aloni, Égré, & De Jager, 2013 and Schaffer, 2007; Sliwa, 2015)

b. Knowledge who: e.g., who is going to vacation (De Cornulier, 1988; Sliwa, 2015).

c. Knowledge why: the purpose affects the activity. Knowledge that why an activity is important (Lee & Strong, 2003a, 2003b; Koole, Webb & Sheeran, 2015; Sliwa, P. 2015). e.g., why vacations are necessary.

d. Knowledge what: knowing that what are the purposes of an activity or action (Pfeffer & Sutton, 1999; Sliwa, P. 2015; Pellegrino, Chudowsky & Glaser, 2001) e.g., what people do in vacations

e. Knowledge how: how an action or activity can be effective (Sliwa, P. 2015; Cohen & Squire, 1980; Stanley, J., & Willlamson, T. 2001; Ryle, G. 1945a, 1945b). e.g., how the vacations affect on people lives.

These questions require answer for proper knowledge.

4. Knowing how: The next level is to shift from knowledge that to knowledge how. Knowledge how is the implementation of knowledge that we know before like previous example about vacation we know whether, who, why, what, how but whether we know how to apply these information in practical knowledge (Gilbert Ryle, 1971, 1946, 1949; Bengson & Moffett, 2007).

In this competitive, dynamic, and complex environment the learning organization needs to more effective in knowledge creation and transformation process which is new, advance, and practical. According to (Ichijo & Nonka, 2006, 2007; Murmann, 2003; Murmann, Aldrich, Levinthal & Winter, 2003; Stephan, Murmann, Boeker, & Goodstein, 2003; and Tallman,

Jenkins, Henry & Pinch, 2004) in twenty first century organizational members can extend their intellectual capabilities through creation of new knowledge. The sustainability and success of any organization depend upon intellectual capital that is the part of knowledge creation by transferring and interpreting it (Sher & Lee, 2004; Rastogi, 2000a, 2000b; Choo & Bontis, 2002; Bontis, 2002 and Wiig, K. M. 1997a, 1997b, 2002).

Therefore many studies which are based on knowledge creation and transformation are focusing on the source and state of knowledge (Alavi & leidner, 2001a, 2001b, 2001c; Muller & Zenker, 2001a, 2001b) not paid much more attention on situations and organizational cultures that make possible knowledge creation and transfer within organization. There are varieties of means that create possibility of knowledge creation and transfer process within organization; nevertheless not much availability of researches on learning organization as a way of assist learning and knowledge management and their role in knowledge creation and transfer (Weldy, 2009). Leaning organization include the establishment of systems to capture and share knowledge (Marsick & Watkins, 2003; Watkins & Marsicks, 1993; Marsicks & Watkins, 2003), as a result the learning organization are very helpful for progress and gross root development in competitive environment.

2.7.1 Concept of Knowledge and its Creation

The description of knowledge correctly is a little complicated. Recognition of the concept of knowledge creation and transfer is fundamental before debating on it as employees most of the time be unsuccessful to acquire fresh and new knowledge due to a mistake of the exact concept. The recognition of data, information, and knowledge must necessary for better understanding. In general, a raw fact, which is unanalyzed, is called data, and data that is analyzed and organized in proper information, and information having proper purpose or meaning is called knowledge (Bhatt, 2001; Yahya & Goh, 2002; Mason & Pauleen, 2003). According to Davenport & Prusak 2000; Lesser & Prusak that knowledge is established from information and information comes from data. Argyris & Schon, 1996 and Schön & Argyris, 1996 argued that "While information is descriptive - that is, it relates to the past and the present - knowledge is eminently predictive, that is, it provides the basis for the prediction of the future with a degree of certainty based upon the information." Boisot, 2002 stated that first thing is to be clear about the fundamental meaning of knowledge which is the most important part. The

most related concept which is connected to the knowledge is data and information and these related concepts somehow make confusion. The precise and understandable differences between these three are given below.

Data: Data comes from the world. Data creates different and various perceptions only necessary perceptions are carried out (Boisot, 2002).

Information: Information plays a middle role in between data and knowledge. When data change into information that modifies the agent's expectation in a particular way (Boisot, 2002).

Knowledge: Knowledge comes from agents. Specific related and up-to-date information that is carried out by agents is called knowledge (Boisot, 2002).

In another way, a small quantity of relevant data needed to agents in form of information that further becomes knowledge when executed. Therefore to convert data into knowledge, agents took data and pick up relevant information for use, and usage of this information is called knowledge.

Though the word knowledge is more understandable and frequently used by people the definition of knowledge is not as simple as we think. It is because of different knowledge taxonomy which is used in an organization. To develop an understanding of the definition of knowledge despite having difficulties we must differentiate a different kind of knowledge. Knowledge has been in form of "hard and soft (Huber, 1991), formal and informal (Conklin, 1996), proprietary, public, personal, and commonsense (Boisot, 1995a, 1995b), tacit and explicit (Argote & Ingram, 2000; Argote, Ingram, Levine & Moreland, 2000; Nonaka & Takeuchi, 1995), embraced knowledge, embodied knowledge, embedded knowledge, and encoded knowledge (Blackler, 1995; Blackler, Crump & McDonald, 1998)."There are a variety of definitions in different researches by researchers; therefore the following description of knowledge is more precise and complete than others: "Knowledge is the whole body of cognition and skill which individuals use to solve problems. It includes both theoretical and practical everyday rules and instructions for action. Knowledge is based on data and information, but unlike those two, it is always bound to persons. It is constructed by individuals and represents their beliefs about causal relationships" (Probst, Raub, & Romhardt, 2000, p. 24). The sequencing of ideas, rules and regulations, processes, and information in mind and execute them

(Marakas, 1999; Bhatt, 2000, 2001). The meaning of knowledge makes knowledge meaningful otherwise proper sense or logic the knowledge is in stagnant form.

The world economy, strategic unions, investment systems in the world, and entrance into the global market uncovers that knowledge creation and transformation are meaningfully important in all learning organizations (Eliufoo, 2005a, 2005b). For improvement in organizational performance, competitive advantages, and gross root development, knowledge and utilization of knowledge is the main determinant of knowledge-based theory (Alavi & Leidner, 2001a, 2001b, 2001c). Based on the study of Eliufoo (2005a, 2005b), the vision of an organization continuously expands and that organization comes in a position to achieve the organizational goal by using knowledge and this may help for competitive advantages also. In today's world, decentralization is a more trending structure of an organization but learning organizations must be more focused on their needs by managing them to stand in the competitive environment. However, they have to work on capturing, creating, and transferring fresh and original knowledge which they needed for the organization.

Knowledge creation and knowledge have various conceptual components, as they two are constructs, in that case, they are theoretical variables that are 'invented to explain phenomena' (Schriesheim, Hinkin & Podsakoff, 1991; Schriesheim, Powers, Scandura, Gardiner & Lankau, 1993; Hinkin & Schriesheim, 2008; Yammarino, 1993). The main attention or interest in abstract theoretical variables is their construct validity. The judgment of constructs is as adequate and accurate as its purpose to measure and reflect the study objectives in its content (Nunnally & Bernstein, 1994). To estimate the content validity the definitions and concepts of study must be clear and relevant and the meaning of each factor that is useful to measure the construct reflect the main topic that is representative in the content domain and Content of the study present its objectives (Carmines & Zeller, 1979a, 1979b).

Hence, the very first step for the study about knowledge and knowledge creation is to determine its content validity by reviewing its theoretical definitions that are helpful to specifying relevant content (Mitchell & Boyle, 2010; Chung & Yoon, 2015; Durst, Edvardsson & Bruns, 2013).

The discussion on the literature of knowledge and its creation is complete with continuing and inconsistent definition and phenomena of knowledge that surrounded in research

studies (Garavelli, Gorgoglione, & Scozzi, 2002; Gourlay, 2006a, 2006b; Kakihara & Sorensen, 2002a, 2002b, 2002c; Pica & Kakihara, 2003) because most of the researches on knowledge creation based upon abstract idea or concept of knowledge (Droge, Claycomb & Germain, 2003; Madhavan & Grover, 1998; Sarin & McDermott, 2003), while the discussion about the definition of knowledge creation and operationalization largely depend upon the investigative approaches (Bryant, 2005; McFadyen & Cannella Jr., 2004; Un, Cuervo-Cazurra & Asakawa, 2010; Un & Cuervo-Cazurra, 2004). This has not been debated or categorize together with the conceptualization and methods (Droge et al., 2003; Madhavan & Grover, 1998; Sarin & McDermott, 2003), and not either the relevant research come into existence without a construct definition of knowledge creation (Droge et al., 2003; Kess & Haapasalo, 2002; Haapasalo & Kess, 2002; Lee & Cole, 2003; Madhavan & Grover, 1998; Matusik & Heeley, 2005; Smith, Collins, & Clark, 2005; Collins & Smith, 2006; Smith, 2005). The researcher who defines the knowledge creation shows a proper procedure and progress.

"Knowledge creation as a process refers to the initiative and activities undertaken towards the generation of new ideas or objects (Mitchell & Boyle, 2010)", for example, Styhre, Roth, Ingelgard, (2002); Ingelgard, Roth, Styhre, Shani, (2002) said Knowledge creation is the utilization of intricate and irregular situation and incident to deal with the problems and issue individually and collectively.

By procedure, knowledge creation is described by Ferguson, 2009, as the method or means due to which the knowledge is created or produced and make difference at the end of infer or outcome. Knowledge creation in from of outcome is the production or creation of fresh and original ideas which is used as input of existing ideas by elaborating those ideas (Parent, Gallupe, Salisbury, Handelman, 2000; Parent & Gallupe, 2000).

The existing knowledge by using which one is going to start the project and what kind of knowledge must be known for progress and success in that project is called knowledge creation (Johnsons, 2002; Analoui, Hannah Doloriert & Sambrook, 2012; Priss, 2002). "As an output, knowledge creation is defined in terms of an immediate product the knowledge creation process, such as the representation of an idea, and can be differentiated from its impact on the organizational system, or outcome" (Mitchell & Boyle, 2010). The fresh knowledge is dispersed, accepted, and surrounded by new ideas and opportunities in the organizations that are the

outcome of knowledge creation (Argyris & Schon, 1996; Schon & Argyris, 1996; Nonaka, 1994; Phan & Peridis, 2000), for example, the take the ideas in and understand fully from the outside of the new set of laws and schedule (Phan & Peridis, 2000; Phan, Lee & Lau, 2003; Jones, Chonko & Roberts, 2003; Poh-Kam, 2000). "Knowledge creation as an outcome is defined in terms of a value-adding object" Mitchell & Boyle, 2010. Further, Mitchell & Boyle thought that knowledge creation logically precedes knowledge creation outcomes, and this process leads toward the output of knowledge creation, the whole process simply classified into three tiers. As a procedure, knowledge creation is a mirror of ideas and actions start with the creation of knowledge outputs, new thoughts, and things. As an output, knowledge creation is the productive change in individual perceptive which is assessed as considerably unusual from existing knowledge that leads towards the conceptual base of knowledge creation outcomes. As an outcome, the creation of value-adding things likes schedule, goods, publication, and services.

Knowledge is an intangible thing that needs physical thing for its completion in short knowledge is an idea that needs to matter for implementation and expression. Knowledge creation deals with explicit and tacit knowledge. Most of our knowledge has fundamental associations with its effect (things). Adam Smith said of the "skill, dexterity, and judgment" of labor that the knowledge is also situated in hand not only in the head as like skilled and experienced teacher use teaching tools and methodology to show the complete picture of his or her knowledge.

2.7.2 Philosophical Nature and Characteristics of Knowledge

Stehr & Adolf, (2016, 2018a, 2018b) said in their research that some things exist in this world that cannot obtain by using power and money, and knowledge is an entity that is not obtained by using power and money. We can buy material things (house, clothes, lands, etc) by using money.

> "An heir to an empire may be born, he may be the legal successor
> to thrones, armies, and navies; over these, he may exercise
> dominion and be their possessor, but no man was ever born an heir
> to knowledge." (Scientific American, 1851)

Stehr & Adolf, (2016, 2018); Ruser, (2018) studied in their research (the price of knowledge) that the problem arises that "how to assess and measure the value or price of

knowledge and probes the issue from a variety of social scientific and practical perspectives" (Stehr, Adolf, 2016) Knowledge plays a stronger role in all sector of an economy. The image of knowledge creates difficulty to split up from its owner. As knowledge has diminishing and obsolescence properties for this purpose there is a need to update the knowledge. Knowledge cannot be often capturing in a simple and clear-cut manner. It is a complicated and technical process to assess the knowledge and execute in process.

As demonstrated by Orr in his research of field technicians, knowledge formation can be interpreted in the context of gaining an understanding of a situation. It can also be interpreted in terms of innovation, such as the creation of fresh insights and information. Like Orr, Brown, Duguid, Takeuchi and Nonaka consider knowledge formation a social activity. They have discussed in length how knowledge is created, and they have mentioned social aspect by building their own ontology of creatures that produce knowledge. However, the only source for their epistemology is Michael Polanyi's writings.

For the sake of context, it is important to briefly discuss Michael Polanyi before moving on with Takeuchi and Nonaka's theory of knowledge generation. Polanyi was a Hungarian physician and philosopher who later became a chemist. The attack on the notion of objectivity as it portrayed in the fields of science and philosophy in the middle of the 20th century is the key element of Polanyi's work. The shifting interest in scientific activity is his main contribution to the philosophy of science. With Polanyi's change of focus, I have completely covered the research studies that form the basis of the majority of information in this chapter. Many following researchers, both in the philosophy of science and elsewhere, have focused on this change (Kuhn, 1996), but also in other fields of science (Geertz, 1973; bourdieu, 1977; Bourdieu, 1987; Suchman, 1987). Peter Naur claimed that there isn't a proper scientific process for researchers in the work of philosophers of science (Feyerabend, 1996). When examining non-canonic work practices as opposed to canonic work practices, Duguid and Brown's and Julian Orr's research works reflect Polanyi's change in emphasis from ideals to practice.

Nonaka and Takeuchi focus on the positive outlook of Polanyi's work. This paper illustrates Polanyi's growing interest in epistemology, as opposed to his critique of objectivity. Polanyi painstakingly develops his own epistemological model and offers a comprehensive

framework for considering knowledge as a personal concept. His epistemology addresses both implicit and explicit knowledge (Polanyi, 1969). Explicit knowledge is structured and methodical. Manuals, publications, and lectures provide examples of how it is a part of our regular professional lives. In our working lives as software engineers, for example, we surround ourselves with focused documentation. It is the textbook used to master new development methodologies or programming languages. These are unavoidable facts. Though quantifiable, this knowledge just represents the top of the iceberg. More information exists than can be summed up in words or numbers. Experience, individualized perceptions, and intuitions are forms of vital knowledge that are difficult to express or communicate. Tacit knowledge is what Polanyi refers to. Unspoken knowledge is difficult to see and convey. It has two dimensions. Hard to define skills and knowledge make up the technical dimension. These are the kinds of abilities and information that people accumulate through time yet find it difficult to describe or articulate. It can be demonstrated by the skill that a master craftsman has attained through years of practice. There is also a cognitive component to tacit knowledge. Schemata, mental models, established ideas, and perceptions that we take for granted make up this domain. It is a reflection of reality, as it is, and a goal for the future, as it should be. (Nonaka and Takeuchi, 1995; Polanyi 1969).

Nonaka and Takeuchi examine the mechanisms and procedures by which knowledge is formed, building on Polanyi's conception of knowledge. They contend that comprehension of organizational knowledge creation is essential for understanding knowledge creation. Epistemology and ontology are the two dimensions along which knowledge is created. Polanyi's difference between explicit and tacit knowledge serves as their epistemology and theory of knowledge. Their ontology, which mobilizes and transforms tacit knowledge, is crucial to their epistemology. The degrees of knowledge-creating entities are a focus of ontology. These levels are individual, group, organizational, and inter-organizational in Takeuchi and Nonaka's view. In this way, they view the process of creating knowledge and meaning as more of a collective endeavor than merely an individual one. Nonaka's point of view is predicated on the "critical assumption that knowledge is formed and developed through social interaction between tacit knowledge and explicit knowledge" (Nonaka and Takeuchi 1995). Individuals produce and

possess knowledge. According to Nonaka and Takeuchi, the difficulty is in getting people in a group to share their tacit knowledge. This is referred to as the knowledge spiral.

Building a field of engagement is typically the first step in socialization. It is the practice of sharing experiences. The exchange of members' experiences and mental models is made easier. Apprenticeship, internships, and on -job trainings are its examples where learning is accomplished by observation, imitation, and practice. Socialization takes place within a concrete context as the recipient finds little meaning in the simple transmission of context-free, abstract information. A shared understanding of an environment is crucial for effective socialization.

The process of converting tacit knowledge into explicit knowledge is known as externalization. In this style, metaphors, analogies, concepts, or models are the forms that tacit knowledge takes. The ambiguity of these images is thought to be crucial because it promotes introspection and interpersonal engagement. Members express their hidden, difficult-to-communicate tacit knowledge through thought, discussion, and engagement. This kind of knowledge conversion is generally observed throughout the concept-creation process and is sparked by discussion and group reflection. Analysis is not done here.

Combination is a method for organizing ideas into a knowledge structure. Different bodies of information are exchanged, combined, and enriched by people. It is a method of rearranging existing data by grouping, merging, adding, and categorizing explicit knowledge. New products, services, or managerial systems are developed by connecting recently acquired information with knowledge already present from other divisions of the firm. Nonaka and Takeuchi as another example of this kind of knowledge translation mention an MBA program.

Learning by doing is strongly tied to internalization the fourth phase of information conversion. It is the culmination of the first three modes of internalization. Shared bodies of information are internalized by the person as shared mental models or technical expertise. Without reliving other people's experiences, this might take place. Nonaka and Takeuchi say:

The event that occurred in the past could be transformed into a tacit mental model if reading or hearing a success story lets members of the organization feel the realism and essence

of the story. Tacit knowledge becomes a part of the organizational culture when the majority of the people of the organization share this mental model. (Nonaka and Takeuchi, 1995)

Nonaka and Takeuchi examine the social elements that support knowledge development rather than proposing a process model to facilitate the knowledge spiral. Intention, autonomy, fluctuation and creative chaos, redundancy, and lastly necessary variety are listed as the five enabling criteria.

According to Nonaka, intention is "an organization's aspiration to its aims" (Nonaka and Takeuchi, 1995). This manifests as a strategy in a commercial setting. The ability to acquire, generate, accumulate, and utilize information is the essence of a strategy for the objectives of organizational knowledge creation. The most crucial factor in determining whether a particular piece of knowledge is accurate is organizational intention.

Individuals produce and possess knowledge. People should be permitted to use their autonomy within the constraints imposed by their surroundings. Nonaka and Takeuchi's second enabling condition is autonomy. To improve the likelihood of offering unexpected chances, autonomy is crucial. Additionally, it encourages individuals to produce new information. Independent individuals generate original ideas, which spread throughout the team and eventually become organizational ideas.

The third organizational requirement for fostering knowledge spiral is flux and creative chaos. According to Nonaka, fluctuation is "order without recursiveness" (Nonaka and Takeuchi, 1995). Members of an organization encounter a breakdown in routines, habits, or cognitive frameworks during fluctuation. They start to doubt the veracity of their fundamental worldviews. As new ideas must be sought through conversation, this breakdown encourages the formation of new knowledge. Chaos can result from an organization experiencing a genuine crisis (such as a rapid decline in production), or it can be brought about by executives intentionally creating an atmosphere of crisis within a business. Chaos, like fluctuation, draws an organization's attention to the issue at hand and helps it find a solution. In this sense, a crisis might be characterized as "creative chaos," when the issue that has to be handled is discovered. This stands in stark

contrast to analytical information processing, which presents a problem and then identifies a solution by fusing previously discovered data.

2.7.2.1 Obsolescence and Depreciation of Knowledge

Obsolescence is simply defined as "negative changes in capital values that are solely a function of chronological time" (Rosen, 1975). The state in which the price/value of existing objects and practices diminishing/outdated over time because the new and current objects and practices take the old one place which is more advantageous. Knowledge obsolescence is a state in which the trendy, newer, and appropriate knowledge takes the place of old knowledge because the existing knowledge becomes outdated or old-fashioned like in a society the stock of knowledge is revolutionized from time to time to stay updated. The graduates of different generations obtained knowledge differently from institutions, and "obsolescence is related to some concept of vintage" (Rosen, 1975). The existing knowledge that is available to be learned is scientifically changed over time due to researches and innovation that move forward the various subjects. "Firstly, sometimes new knowledge verifies received knowledge to be incorrect or at least general than was supposed at an earlier time. Secondly, similarly, production innovations often render useless skills associated with prior methods" (McKelvie, 2007). The individual who has earlier knowledge and skills leads towards capital loss in both cases. The discoveries and innovations expand the previously available knowledge in a more sophisticated and equilateral manner. Furthermore, both the process is for clarification of students as well as teachers. In both cases --- knowledge is easily available and accessible to students and the innovation leads to improve teaching methods and creates a better and quality environment that is more creative. The value-added of knowledge resources is increased and the opportunity cost of learning is decreased due to systematic changes in the knowledge process. In the end changes in the knowledge creation process through new trends and innovation, the net outcome of the educational institutions become the change and profitable. The revolutionizing process of knowledge can be increased the capability of the current generation in the long run if they involve inactivity of learning something new to enhance their prior learning (Rosen, 1975).

Depreciation is a second concept that is negatively correlated to knowledge. As the age of a person increased the capability of learning must be decreased because of physical and mental conditions. Knowledge depreciation is defined as "negative changes in capital values which

depend on the age of persons possessing knowledge and skills, and which are more or less independent of chronological time and generational differences" (Rosen, 1975). The knowledge depreciation increased when the age of an individual increased and his ability to implement the knowledge and skills become decrease (Rosen, 1975; Gray, 2004).

Knowledge depreciation: Like physical resources, knowledge resources also depreciate. Gallagher, Grubler, Kuhl, Nemet & Wilson (2012); Grubler & Nemet, (2014) said that "The knowledge can be accumulated (learned) but equally lost (unlearned)" (Grubler & Nemet, 2014). The reason of, knowledge depreciation has an association with innovation policy. The clear-cut base of knowledge in innovation and is also the fact of being directly related to knowledge depreciation. The knowledge integration is often ignored and too much and unnecessary focused on knowledge creation and that shows the negative aspect knowledge equation. Furthermore, knowledge depreciation is a less researched area till now.

According to Grubler & Nemet (2014), knowledge depreciation depends upon two variables. The first is a degree of "innovation-driven technological obsolescence" and the second one is the knowledge depreciation due to turnover ("the rate at which employees leave a company and are replaced" (Shenoy, 2012)) of knowledge owners.

The world is fastest shifting toward modernism and technological advancement and the information and communication technology (ICT) area is an example of "innovation-driven technological obsolescence" (Thompson, 2001). The trends change in technology very quickly and consumers tend to dispose of the old devices because the new and better models with high technology are introduced.

Knowledge depreciation is happening because of employee turnover in an organization. The turnover of knowledge holder employees in an organization leads towards knowledge depreciation (especially when these employees have a strong position in the organization knowledge account).

The first type of depreciation occurs when the knowledge assets of an organization are highly in tacit form and in case of turnover in the organization, there is a need to obtain knowledge asset again (Argote, Ingram, Levine & Moreland, 2000; Argote, Beckman & Epple, 1990; Esposti & Pierani, 2003). When the old knowledge becomes outdated this is the second type of depreciation in which "knowledge can depreciate because of insufficient recharge of

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knowledge" (Evenson, 2002), this happens when the financial condition of the organization is not stable as old knowledge is irrelevant but new knowledge cannot use to start or continue an action or process.

2.7.2.2 Knowledge is of the Essence

The point is here that the goods or tools which are used in any organization based upon an idea that comes from the human being, so all goods, and tools are knowledge. The idea on which the good is based on the main component of a thing, e.g., the whiteboard that is used in the classroom is based on ideas (knowledge), so anything that is made by the human being is a form of tacit knowledge.

According to (Baetjer, jr, 2000) the knowledge is extremely important with its accuracy. We might say that the larger quantity and good quality of knowledge lead toward better physical stuff or excellent performance. Like a computer, the software is a kind of intangible form of knowledge that works in physical form (computer) (Bennet, 1985). It is now clear that how tacit knowledge works in the explicit form of knowledge.

2.7.2.3 Knowledge as a Source of Competitive Advantage

The rivalry among economies is increasing day by day and the structure of an organization is also changed from physical resource to knowledge resources as all organization based on resources and the most tactically important resources is knowledge (Conner & Prahalad, 1996a, 1996b; Grant, 1996a; Grant, 1996b; Spender & Grant, 1996; Osterloh & Frey, 2000; Ghoshal & Nahapiet, 1998; Splender, 1996; Bapuji & Crossan, 2004. 2005; Bapuji, Crossan & Rouse, 2005). Information is different from knowledge:

> Orterloh & Frey, 2000 stated in their paper that "Information is a flow of messages, while knowledge is created by that very flow of information, anchored in the beliefs and commitment of its holder... Knowledge is essentially related to human action (Nonaka and Takeuchi 1995, pp. 58–59)."

The more difference between explicit and tacit knowledge (Polanyi, 1966; Michael, 1966; Castillo, 2002) explained by (Orterloh & Fery, 2000) is that the explicit knowledge is in form of writing or symbol. Tacit knowledge is more than explicit knowledge because tacit knowledge is

based on human knowledge and "we can know more than we can tell" (Polanyi, 1966; Michael, 1966; Castillo, 2002). The difference between explicit and tacit is important because the transferability and appropriateness are based on these two forms of knowledge (Grant, 1996a; Grant, 1996b). Tacit knowledge is private stored knowledge in human being in form of experience and skills which cannot be easily shared and transferred. Explicit knowledge is a form of public good that is available publically with the exclusion of copyrights or patents.

There are two consequences of tacit knowledge and the first one is the tacit knowledge is important for competitive advantages because tacit knowledge has imitated element for the competitors (Teece, 1998a, 1998b); the second one is tacit knowledge cannot be measured easily.

2.7.3 Source of knowledge

According to Marr, B., Gray, D., & Neely, A. (2003) knowledge creation is based on three types of sources:

1. Autopoetics

2. Cognitivists

3. Connectivists

1. Autopoetics

The expansion of personal knowledge along with complication in the conveyance of information is called autopoetics. Teachers and learners in an educational institution are the examples of autopoetics.

2. Cognitivist

It refers to the verification, accumulation, and distribution of misinformation from the main knowledge account of the organization. The accurate knowledge development within an organization by integrating new information in the knowledge system through the systematic procedure that follows some rules and regulations is called cognitivist.

This type of information and knowledge is comprehensive and more accurate in order to create the solution of knowledge sharing systematically.

3. Connectivist

There is little difference between cognitivist and connectivist as both have the same set of uniform procedures but still the former is a bit different from the latter. Cognivist has predefined solution but connectivist has not.

Relatively, there is an association between the source of information and the connection of information as they are related to each other. Hence exchanging and sharing knowledge is the most important component of knowledge creation. Organizations pick up the idea of meta-analysis, brainstorming, and seminars (workshops) as well as collaborative learning for the team or group in the account of knowledge creation.

Knowledge creation always depends upon inner environment of organizations, as internal communication between the members of an organization is full of involvement. This way collective knowledge asset of the organization would be increased. Everyone has independent knowledge and it increases when the interaction between employees happens in an organization. Knowledge creation concentrates on spreading and conveying knowledge abundance in an organization.

2.7.4 How Learning Organization can Facilitate Knowledge Creation and Transfer?

Prior knowledge is important but an organization cannot stand only on previous knowledge. Therefore, new knowledge is necessary to deal with hard and changing conditions (Hannah & Lester, 2009). Based on the study of Watkins & Marsick (1993) an organization must be converted into a learning organization because of changing conditions related to work environment, people's learning conditions and work-force adjustments. The system is much needed to maintain all the learning in the organizational memory. Learning organizations all the time try to find ways to detain the learned concepts to go on to function even if a highly mobile, temporary workforce fails to function well. Furthermore, organizations require saving all that is learned to the constant extremely dispersed workforce, regardless of how far they are situated (Watkins & Marsick, 1993). As stated by Senge (1990, p. 7), an organization based on learning is the one "where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together".

A learning organization modifies itself from time to time by helping its members to learn new concepts and develop new ideas for the knowledge account of the organization (Pedler, Burgoyne, & Boydell, 1996). Furthermore, learning organizations create a stable system of capturing and sharing knowledge for their progress and gross root development and to remain competitive in the market (Calantone, Cavusgil, & Zhao, 2002; Gonzalez, 2010). Therefore, learning organizations make possible and useful knowledge creation and transmission:

2.7.4.1 Organizational Learning and Creation of Knowledge

Organizational learning and Knowledge creation "follow their independent themes in research. The link between organizational learning and knowledge creation is likely to stay for a long time because it is one of the hardest things to create and adjust fundamental (basic) assumptions about knowledge, information, environment, and learning". The route between organizational learning and knowledge creation is hardly taken for research to find out the relation between them (Argote, 2011) and for decades there has been inadequate knowledge about the linkage between both (Brusoni & Rosenkranz, 2014).

Nonaka strongly believed that knowledge creation and organizational learning are separate but parallel concepts. He Nonaka developed a covering layer between them. Thus organizational learning and knowledge creation have their separate definitions and theoretical constructs. In knowledge creation literature, organizational learning has been ignored or less attention is given to it with careful planning, and this deliberate choice has been easily noticed because the knowledge creation is detached from the concept of learning (Nonaka, Kodoma). Furthermore, the precise difference between the processes of organizational learning and knowledge creation models is also prominent in the organizational learning community. Here, researchers make practical and effective use of ideas or theories that contain various elements of change in behavior, actions, or routines (Agyris) rather than focusing on new knowledge creation it is a difficult task to compare the two distinct fields.

2.7.4.2 Knowledge Creation Requirements

Organizational structural styles and planning, correspondence, trust, enthusiasm, learning, and practice are the organizational systems that help in establishing and transferring knowledge culture and behavior in an organization. Nonaka, 1994 said the following factors are considered as conditions in encouraging the knowledge creation spiral:

Intention: The state of mind of individuals about the world and how they understand their environment by managing their intentions. The mission, vision, short term, and long-run achievable objectives of every organization expect the future position of an organization through the performance that is determined. Organizational intention, therefore, is the progress of moving prospects, strict criteria, and values.

Autonomy: To create knowledge, autonomy or self-sufficiency play an important role in motivating and encouraging individuals. Organizations giving their staff the authority to act freely are likely to increase the chance of unexpected opportunities. Self-sufficiency gives people the flexibility to assimilate learning.

Fluctuation and creative chaos: To enhance the existing and in-progress knowledge, interaction of people within and outside the organization as well as the awareness of internal and external environment creates possible questioning of knowledge. When organizations and individuals are stimulated by outer elements, they become more creative, rethinking more progressively and making connections globally.

Redundancy: Redundancy plays an important role in knowledge creation practices and is considered as one of knowledge creation conditions. The working condition in which two departments of an organization work together and exchange not only ideas and information but also meet up frequently formally or informally (such as get-together) is an overlapping approach and a door to building redundancy (Eliufoo, 2005).

Required Variety: In every environment, there are some varieties and complexities and the organizational inner diversity manages to deal with it. The issues and challenges that are faced by any organization can be overcome through the greater diversity in its assets and that organization can draw different points of view or receive a multifaceted approach.

2.7.4.3 Role of Administration to Promote Knowledge Creation and Transformation

Designing suitable construct: transformation and creation of knowledge are not easy as we think. To build the environment of sharing between staff about their experience and information, enhance and integrate their perspective and perception, and furthermore assess their thoughts for knowledge creation and transfer, managers should develop a proper structure in an

organization. A proper and appropriate structure can bolster critical thinking, basic reasoning, and development that are imperative for knowledge creation and exchange.

Designing: the training is much needed for individuals to work with an organization to work as in team or group, to handle the duties and responsibilities, to share and communicate their knowledge and experience with others. Likewise, individuals need to know how they can recognize their problems and deal with their problems successfully during work.

Motivation: to promote sharing knowledge and ideas between individuals and groups, a manager should create a proper environment in an organization. The staff of an organization must know that the aggregate ideas are better than personal thoughts. To support teamwork and ideas sharing, an organization should offer incentives to support it.

Technology: communication is a vital component that influences learning and knowledge creation and sharing. Knowledge creation and sharing are complicated if effective communication is not held in an organization between its members about their ideas. For effective communication the manager can utilize innovative techniques such as using technology (media and internet). E-learning, social media networks, video presentation are extremely helpful for this purpose.

2.7.4.4 Facilitate learning in organizations

Through the equitable culture that is the base of a learning organization; this system inserted that catch and distributes knowledge in light of the critical thinking cycle. Employees in a learning organization can always learn by shifting their regular challenges into learning opportunities and favorable circumstances. They can looking for the experience as an activity; hit upon solutions to problems; review conclusions, and implement fresh concepts and plans to manage comparative practices in future (Watkins & Marsick, 1993). For knowledge acquisition, learning is an essential aspect in the absence of which knowledge cannot be created. To facilitate learning for the employees of an organization, a proper system needed to be established for knowledge creation . As indicated by Watkins & Marsick (1993), a learning organization encourages learning for the entire organization at all levels: at the level of both individuals and groups. To develop learning in a learning organization, learning dimensions are the crucial factors that are shared in vision and mental models by Senge, 1990; Watkins & Marsick, 1993. Learning in learning organization continuously modifies its knowledge creation system and

facilitates the learning of its employees (Pedler, et al., 1996) keeping in mind the end goal to create a system to detain and distribute knowledge. As a result the organization may proceed to advance and grow aggressively (Calantone, et al., 2002; Gonzalez, 2010).

2.7.4.5 Generate new knowledge

Creating fresh knowledge within the organization and procurig-required knowledge from external forces are important activities for a learning organization. Learning organizations flourish with quality knowledge and make connections with others. For that reason, knowledge ought to be effectively available no matter whether it comes from individuals or through data innovations (Marquardt, 2002). As per Garvin (1993) "A learning organization is an organization proficient at creating, obtaining, and exchanging knowledge and at modifying its manner of conducting to reflect new knowledge and bits of information." Moreover, "learning organization introduces a better approach of thinking about a response, inquiring, receiving, talking, reflecting, and making sense of experience for an individual to learn, but also for that learning to be shared with others in teams and used to make changes in the organizations" (Watkins & Marsick, 1993). As indicated by Nonaka and Takeuchi (1995) organizational knowledge passes through an individual it is initially in the form of tacit knowledge and is known by a person who created that information. Through various components, learning procedure in an organization is upheld. In such organizations employees are proactive, intelligent, and inventive (Marquardt, 2002; Marsick & Watkins, 2003). They believe that new information will be made simpler in learning associations.

2.7.4.6 Switching over from tacit to explicit knowledge

People in an organization need to share tacit knowledge within the organization to all its members. The organization is required to change over from tacit knowledge to explicit knowledge for the better output of an organization. For an established organizational system, employees must transfer their experiences and skills by sharing to gain and develop knowledge. Through debate and discussion, general communication, and practice and experience, tacit knowledge is converted into explicit knowledge.

2.7.4.7 Double-loop learning in learning organization

The future needs of an organization are dependent upon nonstop and purposeful learning. In addition, dynamic learning for all employees and organizational learning structure creates

pliability and increases learning (Watkins & Marsick, 1993). A learning organization looks for data, thoughts and bits of knowledge from other fruitful organizations including from the best researchers (Marquardt, 2002). The profit and organizational changes are also connected with knowledge input of the organization (Watkins & Marsick, 1993) and support different and better organizational structure and procedures like twofold circle learning, loop learning for the creation, swapping and, spreading of knowledge that is structured, administered and attained more desirably.

2.7.4.8 Manage knowledge

An organization may have a great account of tacit and explicit knowledge. However, the attributes of an organization are very important because deficiency of these attributes creates problem in managing and categorizing the knowledge account. The grass root system, quality environment, staff opinions, role of leadership and employees, problem-solving associations, and other characteristics of a learning organization are useful to manage and categorize the knowledge account. As specified by Weldy (2009) there are many other issues that can play a vital role for an organization to be appropriate to upgrade learning, knowledge transfer, and training environment - all are required to strengthen and polish knowledge not just for one individual but for people in an organization.

2.7.4.9 Create the applicable knowledge

Crucial thing for an organization is its ability to transfer the knowledge into action. It is more important for organizational progress than mere knowledge creation and transmission because they don't play the role for increasing organizational performance (Alavi & Leidner, 2001). "Learning organizations develop knowledge by processing their failures and successes, enforcing them to transferring and assessment system and reviewing what is gained in a way that will be beneficial for the organization" (Marquardt, 2002). Moreover, learning organizations believe in socialization because people learn better in teams (Watkins & Marsick, 1993). Everyone wants to become effective at collecting information. All candidates of an organization must know of the ways of knowing that may benefit the organization (Marquardt, 2002). Like this learning, organizations vary in transferring knowledge to improve organizational performance and to achieve its goals.

2.7.4.10 Web-Based Knowledge Creation

The structured experiences, norms, recorded information, and values are different forms of knowledge. In the present society knowledge is the only instrument of development and progress. Therefore, it is the responsibility of organizations to not only transfer knowledge but also keep a record of its utilization.

Leonard Barton (1995) has come up with the idea that organizations should not only focus on the storage of knowledge but their main focus should be on building unique abilities in learners through knowledge creation. Nonaka has well defined both explicit and tacit knowledge and according to him, each type of knowledge is created in a specific yet different mode. When comparing both, there is high complexity, which is established at the transmission phase. According to Nonaka knowledge creation is the product of explicit knowledge and tacit knowledge.

2.7.4.11 Affecting factor in knowledge creation

Holthouse said that the of knowledge takes place between knowledge creator and knowledge receivers. This flow helps in understanding the meaning and nature of knowledge. This procedure of sharing and transferring of knowledge is the main flow according to Holthouse. Senge (2003) refers to this as the transmission of information through which people understand each other willingly, and this affects the outcome of knowledge creation. Handrick emphasizes knowledge as a process of information and communication. According to him, knowledge cannot be commercially transmitted like any other commercial product. It is, rather, based on reconstruction activities that result in further learning. The essence of knowledge is sharing and communicating between the demander and owner of knowledge. Sharing and transformation of knowledge is knowledge creation in the true sense.

2.7.5 Knowledge Creation

The procedure of knowledge creation is to strengthen the existing knowledge by adding new knowledge through research and development. The knowledge creation process is not only to build up new knowledge but also to make knowledge transparent and linked with the knowledge system of an organization.

Particularly knowledge and experience of individuals which they gain in their work life is

definitely useful for the welfare of colleagues. Approximately, for the last two decades, interest in knowledge creation practice has been developed in academies and other organizations. The higher education institutions have developed and tested different theories for different areas of application. The knowledge creation theory is applied in many fields and organizations with different phenomena like organizational theories (Osterloh & Frey, 2000; Hinings, B., & Greenwood, R. 1988). Human resource management (HRM), theories of educational leadership and management (Ranft & Lord, 2000; Bush, 2003; Bush, 2008) and organizational behavior (Peterson, 2002; Greenberg & Baron, 2003), innovate and technology management (Nonaka et al. 1996) and many other. These theories are part of several higher education institutions.

Since the inception of the twenty first century knowledge resources are the foundations of a country and its organizations. For their existence and progress, knowledge assets function as the main contributors and producers for an organization. Sharing, transferring, and combining of knowledge are the main interests of an organization engaged with its employees in knowledge creation activities. The stronger the knowledge creation activities are, the more competitive an organization will be. The knowledge creation procedure is the conversion and combination of R & D, learning by doing, and experience building of the employees of an organization. Chang & Lee (2008) said that an employee's ability of knowledge acquisition leads to the positive and significant change in knowledge assets of the organization.

Knowledge creation is achieved through the connection between tacit and explicit knowledge. The conversion of tacit and explicit knowledge is further based on four components:

1. Socialization

2. Externalization

3. Combination

4. Internalization

1. Socialization

Socialization is a process of conversion knowledge from tacit to tacit knowledge. By sharing the experience with colleagues and students without writing it down. However, this type of knowledge has limits when it comes to creating knowledge because the knowledge holder may not be transferring his knowledge into explicit form. Teachers and learners both have a less

scientific understanding of knowledge (experience and skills) without explicit knowledge.

University teachers through sharing (experiences, thoughts, ideas, and opinions with each other) during a discussion, teamwork, and projects obtain the transfer of tacit knowledge from one person to another. O'Dell (1996) describes that sharing of knowledge is the most powerful means to increase personal insights as well as experiences of teachers. Knowledge sharing encourages and increases confidence in teachers who start their career afresh. The transferring of knowledge through sharing would be an effective approach if teachers are willing to share and utilize it in teaching and other activities (Amin, 2005). For the creation and sharing of knowledge, face-to-face discussion between staff is necessary (Nonaka and Takeuchi, 1995). Rismark, & Sølvberg, 2011 said the participation of teachers in knowledge sharing activities (discussion (formal and informal), teamwork, and joint projects) actually involves teachers in knowledge sharing activities that expand their own wisdom. According to Engerstorm (2011), the discussion involves the formation of concepts, thoughts, or ideas. Some other researchers such as (Webb & Blond, 1995; Mercer, 1995; Hiebert, Gallimore & Stigler, 2002; Carroll, Choo, Dunlap, Isenhour, Kerr, MacLean & Rosson, 2003; Berry, 2007) also agreed to the point that socialization has a positive impact on knowledge creation. Teachers share their experiences, ideas, concepts and opinions with each other. Some teachers like Deans, Heads of departments have authority to manage and hold things well In short socialization improves the knowledge creation activities as supported by Weir and Hutachings, 2005 that socialization is a natural process in the workplace.

2. Externalization

Externalization is a process of knowledge creation that is based on conversion of tacit to explicit knowledge. This type of knowledge is shared by using image and conceptual theories.

Externalization needs internal bound to support examples, such as giving others a complete understanding of something the examples and analogies help to describe tacit knowledge. Abstraction needs verbalization with the support of examples to provide others with complete understanding (Newman, Griffin, & Cole, 1989). The influence of outcomes of externalization is not an unknown function of knowledge creation (e.g., Chambers & Reisberg, 1985; Kirsh, 1995; Schwartz, 1995; Zhang, 1997). The externalization relates to the "trialogical" learning approach based on three foundations of learning metaphor called personal learning,

teamwork, and collaborative knowledge creation (Paavola, Lipponen & Hakkarainen, 2004). Teachers in the new era are more expressive and have more tools and devices (multimedia) to interact with the world and gain knowledge. In support of findings, some other researchers contribute to this study (Nonaka & Toyama, 2015; Gourlay, 2006; Shirouzu, Miyake & Masukawa. 2002; Huang & Wang, 2002; Dawson, 2014).

3. Combination

Combination is a process-based conversion of explicit to explicit knowledge. The process is complicated and scientific as individuals combine and exchange different explicit knowledge with others. The current knowledge is combined and exchanged by integrating new knowledge in the knowledge account.

The clearer, obvious, and more favorable form of explicit knowledge it is reworded. By means of combination, the pior-disconnected knowledge is connected with the existing one. (Buckley, Carter, Clegg & Tan, 2005). Knowledge combination is a kind of meta-data which refers to "description and information given about other data" (Marwick, 2001). Various researchers have indicated that the combination of existing knowledge is an essential practice for knowledge creation (Schumpeter, 1934; Kogut & Zander, 1992; Tsai, 2001; Nerkar, 2003). Recombination of knowledge is known as innovation (Schumpeter, 1934; Nelson & Winter, 1977; Dosi, 1982) The summary of any event is a kind of explicit knowledge that is recombined to avoid complexity (Tombros, Sanderson and Gray, 1998) with a more structured form (Marwick, 2001). The efficiency of a teacher increases knowledge combination activities like interaction and collaboration with new thoughts, structured concepts, and summaries in an accurate and professional manner (Hargreaves, 1999; Bae, Song & Kim, 2012; Hegarty, 2000; Lin, Lin, & Huang, 2008). In support of knowledge combination and positive influence of knowledge creation, some other research studies have been added (Schulze & Hoegl, 2006; Tolstoy, 2009; Li, Huang & Tsai, 2009; Shu, Page, Gao & Jiang, 2012; Menguc, Auh & Uslu, 2013).

Internalization

Internalization is a knowledge creation process based on conversion of explicit to tacit knowledge. "The process socializes, externalizes, and combines the explicit languages, texts, pictures, or information, and then internalizes them into personal knowledge." In short, the

system in which employees learn from others' new and explicit knowledge, their tacit knowledge is enhanced, increased, and refined.

The internalization knowledge is a kind of "learning by doing" so learning practice is necessary (Nonaka &Takeuchi, 1995). Experience is based on tacit knowledge. People learn from personal experiences and the physical world around (Nonaka, Byosiere, Borucki, & Konno, 1994; Cong & Pandya, 2003). "The internalization and reflection go together with an understanding that reflection comprises a steadily but progressive transformation of genuinely discrete external social knowledge into embedded and personal knowledge (Kolb, 1984)". Teachers facilitate the internalization process of learning through experiences which they share with others (Hou, Sung & Chang, 2009). In support of knowledge, internalization promotes knowledge creation various research studies have been included (Nonaka & Konno, 1998; Nonaka & Toyama, 2015; Popadiuk & Choo, 2006; Shang, Li, Wu & Hou, 2011; Akbar, 2003).

2.7.5.1 Knowledge Creation Process

The four sides of the knowledge creation process show different methods of knowledge creation by using tacit and explicit knowledge. The tacit ad explicit knowledge is based on sharing, transferring, and combination of ideas for the knowledge creation process through individuals and groups. The shared ability of knowledge (experience and ideas) between colleagues in an organization and representation of knowledge by activities and actions enhance the knowledge creation abilities of an individual.

The problem-solving approach proposes the "expansion of learning theory." This approach aims to solve the problem with the twisting of epistemic activities. This approach connects members to find out the gap after examining the condition and producing a plan to solve the gap by executing the idea in the situation.

In a scientific society, the identification of gaps is better rather than waiting for the rise of contradictions. A scientist after inventing something finds out the gap of the design by collecting data and moving forward towards better invention. In additional terms, the scientist uses very limited, exact, and clear-cut knowledge instruments for knowledge creation activities. Knowledge building societies usually repeat the ideas to improve it as like knowledge creation discussion within the educational institution by using teaching-learning approach improve the student achievement and the knowledge assets of the institution had improved the institutional

good-will and competitive advantage.

A similar point about the four sides of knowledge creation is that all of them are based on socio-cultural activities. All four aspects briefly describe the knowledge creation activity from individual level to the group level. Still, all four aspects are different from each other with socio-cultural criteria which are explained in the following line.

Socialization is the process of knowledge creation by sharing experience between humans by using their tacit (unexpressed) knowledge without writing it down. After the mixture of explicit (expressed) knowledge, an organization creates its knowledge creation account. Externalization is a process of sharing knowledge from tacit to explicit knowledge. It is useful for identification of gaps between knowledge assets and fills the gaps with knowledge creation process. Combination of knowledge is a process in which individuals gather explicit knowledge to create new and advanced knowledge. This approach is called explicit to explicit. Internalization is a process from explicit to tacit in which combined knowledge processes are implemented on human beings through workshops or classes.

Another similarity between four approaches focused on in Paavola & Hakkarainen's (2004) studies is about the component of mediating variables in ideas formation (knowledge creation). Reaching over and above the communications through dialogues between educators (learner), it is proposed that learning is "trialogical" because it includes utilizing a variety of mediating objects ("symbols, ideas, and instruments"), mediating practices through the connection of explicit and tacit knowledge and individually developed activity of the same interest with the same objects. The quadratic approaches of knowledge creation are socialization, externalization, combination, and internalization that are employed with the use of explicit and tacit knowledge and spread knowledge within the organization through knowledge sharing. The knowledge objects have a two-sided part in the knowledge creation process— the first one is to improve and enhance the knowledge and the second one is focused on the outcomes of the knowledge creation process.

The knowledge objects (ideas, tools, and symbols) take mediating part in the creation of knowledge and direct knowledge creation towards advancement. Paavola and Hakkarainen (2004) presented thorough clarification on the inspiration and plan of joint construction of ideas by integrating different theories for knowledge creation perception is called "trialogical

approach."

2.7.5.2 Theories related to Knowledge Creation

There is a quadratic angle of knowledge creation that comes into sight from different backgrounds and groups of people. Paavola et al. (2004) planned a fresh image of learning by recommending a familiar idea between three significant models of creative knowledge. "The joining of three models for knowledge creation and these models are

1. Knowledge building (Scardamalia & Bereiter, 2006),

2. Organizational knowledge creation model (Nonaka & Takeuchi, 1995),

3. The expansive learning approach (Engestro¨m, 1999)"

The intention of these knowledge creation approaches is the identification of the role of knowledge creation in education perspective in a different situation.

Further added to these three models is the assessment of ideas formed during the knowledge creation process in scientific societies because scientists' job is the essence of knowledge creation.

We know that even inside a unique circumstance, contending learning creation models may exist. For instance, different methodologies are planned for authoritative information creation (Stacey 2001), and all scientists have not the same and precise point of view (Gourlay 2006a, 2006b). The reason for adjoining these three models is to check the gap between knowledge creations with a different point of view.

This study about knowledge creation is related to the direction of these approaches which help expose gaps and differences between knowledge creation processes. (a) What are the basic points of the knowledge creation process by joining three models? What types of people are involved in knowledge creation process? (b) What are the metaphysical beliefs and consequences of this idea-creation process? (c) How is the knowledge creation process influenced when the three models are joined? (d) What are the main situations involved in the knowledge creation process? Paavola and Hakkarainen likewise talked about a few contrasts and shared traits among a portion of these points of view.

1. Knowledge building

Knowledge building is a theory developed by Scardamalia & Bereiter, 2006. The knowledge-building theory on individuals and groups only. Knowledge building is an educational theory based on transferring traditional educational practices to newer constructivist methods by bringing students from learner to inquirer and making them feel like an active members of the knowledge building community. The idea behind knowledge building and knowledge creation is the same. The combination and creation structure of ideas used for making theories, models, and problem-solving activities are knowledge-creating or knowledge-building exercises.

2. Organizational Knowledge Creation Theory

The hierarchical learning creation hypothesis, advanced by Nonaka & Takeuchi (1995), is set for the business associations. The description of their book – How Japanese Companies Create the Dynamics of Innovation – recommends where the hypothesis was enlivened. As an administration hypothesis, it advocates a purposeful approach by the organization's administration or pioneers. The main thrust for learning creation is to keep up the aggressive edge of the organizations, where new thoughts and new items produce business esteems for the prosperity and strength of an organization.

Nonaka and Takeuchi (1995) regard new information as "legitimized genuine conviction", which involves responsibility, objective coordinated activity, and contextualized meaning. A case is the new "Tall Boy" idea by Honda, which leaves the regular outline of long, low vehicles. This new idea means to amplify comfort for auto clients, and it prompts a weighty generation of tall and short autos, common among Japanese-fabricated autos. Nonaka and Takeuchi additionally recommended sorts of information inside and crosswise over units of performing artists, including learning of people and intra-and inter-organizational information, where an association "increases the learning made by people and takes shape as a piece of the learning system of the association". Their hypothesis started on the qualification between unsaid learning (Polanyi, 1966) and unequivocal information and the conceivable change between these two methods of information. Inferred learning is "close to home setting and accordingly difficult to formalize and impart," while express information is "transmittable in formal, deliberate dialect" (Nonaka & Takeuchi, 1995).

The principle motivation behind the learning creation process as proposed by Nonaka & Takeuchi (1995) is prominently known as the SECI show, which remains for the four methods of information change: socialization (S), externalization (E), combination (C), and internalization (I).

3. Expansive Learning in Cultural-Historical Activity Theory

The hypothesis of expansive learning (Engestro¨m, 1999; Engestro¨m & Sannino, 2011), started on the social verifiable movement hypothesis or CHAT. Engestro¨m et al. 1999, proposed that the learning creation could occur in a customary work environment setting. The performing artists allude to a gathering of individuals, as opposed to a person. Information creation is activated as an inescapable result of communications inside or crosswise over movement frameworks. It is similar to the breakdown in work that triggers critical thinking or a repair system. In this way, it is a base-up approach including normal laborers; the main impetus of learning creation is to decrease logical inconsistencies.

As indicated by CHAT (Engestro¨m, 1999; Engestro¨m and Sannino, 2010), new learning is shown in the change of a movement framework. A movement is a question-coordinated process directed by subjects acting in connection with the bigger group. What recognizes one action from another is the thought process that drives every movement and the question that the action is situated to, for instance, a gathering of doctors (subjects) chipping away at an issue of patient care between a private facility and a clinic (protest) to discover the answers for the issue (rationale). Talk expands on Vygotsky's hypothesis (1978a, 1978b) that evacuates the Cartesian gap between the screen character and the protest, with social devices (e.g., Internet assets, critical thinking techniques) interceding the subjects' activities on the question. The subjects' work inside the bigger group (e.g., nurture, wellbeing focus staff) with specific tenets or standards, and there is a division of work where group individuals cooperate toward accomplishing the question. Engestro¨m held that a movement framework is the least significant unit for investigation. A change of the action framework could happen to any piece of this movement, and the arrangement of another hypothetical learning or idea shapes the principle result. Engestro¨m (2001) gave a case of how a contention between nearby wellbeing focuses a doctor's facility with persistent care was mostly settled with the change of the idea (instrument) of the

basic pathway (a recommended general pathway for specific sicknesses) to mind understanding (correspondence of plans for patients between human services suppliers and the patient's family).

Expansive learning (Engestrom 1999; Engestro¨m and Sannino 2010) contrasts from conventional originations in which discoveries were emphasized for changes in people's practices or subjective structure as the sign of learning. Talk's point of convergence is on changes of question in aggregate exercises, which could inevitably prompt a change of the movement framework. Logical inconsistencies are the main thrust for information creation as per CHAT (Engestro¨m et al. 1999), yet it frames just 50% of the condition. It is the determination of logical inconsistencies that prompts the development of new protests and thus changes the whole movement framework. It is known as expansive learning in the light of its attention to "new extended protest and example of action situated to the question" (Engestro¨m 1999). Extended articles are not by any means the only types of information creation, Engestro¨m, and Sannino (2010) recommended that broad learning could be shown in the development of the zone of proximal improvement (Vygotsky 1978) or limited intersection and system building. The zone of proximal advancement could be re-imagined as the "space for far-reaching progress from activities to movement" (Engestro¨m and Sannino 2010).

The run of the mill procedure of broad learning (Engestro¨m and Sannino 2010) could be delineated as a winding of epistemic activities that incorporate (1) scrutinizing a few parts of existing works, perceiving logical inconsistencies; (2) breaking down a circumstance to clarify the inconsistencies; (3) demonstrating by building new thoughts or determination to figure out the issue; (4) inspecting new model to create working techniques and recognizing restrictions; (5) actualizing the model; and (6) reflecting and assessing new model to balance out a new type of training. It is a procedure that looks like critical thinking (Jonassen 1997, 2000) however, past issue determination; has a solid spotlight on growing new hypothetical thoughts and testing these thoughts.

Since CHAT centers around protest situated action, a group sharing a typical intention and taking a shot at normal question frames the most key condition for learning creation. The performing artists should be by and by understanding (Vasilyuk 1988) or by and by participating in activities and material articles and antiques and, in this manner, perceive the logical inconsistencies and have the office to change the action framework. The performing artists must

have the capacity to create complex and socially new ideas that are arranged towards a new action framework for future.

Authoritative information creation hypothesis and far-reaching learning hypothesis are applied to settings where learning is made for prompt down-to-earth applications. Researchers are known for purposeful information creation that improves crucial standards and comprehension of this world.

2.7.5.2 Tacit and Explicit Knowledge

The definition of tacit knowledge has been unclear till now because of the ambiguity found in its definition in every research paper. According to Winter's taxonomy, the picture of tacit knowledge is mostly non-expressive or uncertain (Nelson & Winter., 1982a, 1982b; Gerard, 2003); there is trouble in its teaching (Nelson & Winter., 1982a, 1982b; Gerard, 2003) and complication in its application (ambiguity) (Dougherty, 1992; Szulanski,1995, Gerard, 2003). An important assumption about tacit knowledge is that its definition is limited at individual and collective levels. The debate about tacit knowledge has mostly highlighted the idea that tacit knowledge is based on human skills and technicalities, but human beings can also interpret this type of knowledge. The tacit knowledge of a person shows his position in an institution/organization; it can be weaken or strong. It is also possible that an individual is limited to some institutional/organizational structure or maybe limited to social skills and cognitive powers (Gerard, 2001, 2003).

The limitations of tacit knowledge lead to greater cooperation between people as tacit knowledge is a core foundation of cooperative learning (Weick & Roberts, 1993) which is produced by sharing experiences with others (Gerard, 2003). This type of knowledge has characteristics of sharing and coordinating that show the social/organizational behavior because no one has complete knowledge The ability to share and repair knowledge "even through the use of a common language" is not possible without others' help (Berman et al., 2002; Gerard, 2003).

The above discussion shows that the nature of tacit knowledge has more than individual and group levels. An organization with rich tacit knowledge has greater efficiency. Tacit knowledge is a force behind greater outcomes (Gerard, 2003) with precise and correct communication that needs less time by enhancing innovative abilities in an

organization/institution (Kim & Kogut, 1996; Eisenhardt & Martin, 2000; Brown & Duguid, 2001; Rosenkopf & Nerkar, 2001; Gerard, J., 2003).

The mutual adjustment and bringing together individuals is called tacit knowledge (Gerard, j., 2003) and tacit knowledge describes the value of an organization, its intellectual level, and knowledge assets. After the comprehensive view of tacit knowledge the question arises "how tacit knowledge is acquired" and once it is acquired, how works

Paradoxically, the value of tacit knowledge is rarely understood because of the uncertainty of its attainment. The holder of tacit knowledge avoids the transformation because of its competitors. It is believed that tacit knowledge "cannot be taught by reading manuals or listening to lectures" and "must be learned through experience" (Gerard, J., 2003) because it is aggregate in nature and "it is itself a product of the need for its diffusion."

There are some other queries: "How does tacit knowledge work?" and "Where is it stored and how is it accessed?" Tacit knowledge is accumulated in logic and human psyche is developed by the organizational environment (socio-economic) (Galunic & Eisenhardt, 2001; Gerard, J., 2003). The organizational knowledge asset is the one that believes in collaboration (sharing and association) and sustainability of knowledge between members of an organization by using familiar language (Gerard, J., 2003).

The character of teachers in the modern era is difficult to embrace. Previously, the character of teachers as knowledgeable personalities with a collection of prepared and quick settlement was hard to deny. It is challenging to introduce oneself courageously into the discussion with listening, questioning, and speaking equally as a leader to facilitate. Working groups think that the spare time for interaction is too limited.

2.8 Supportive Studies

Knowledge creation is the theory developed by Nonaka and associates (Nonaka, 1991, 1994; Nonaka & Takeuchi, 1995). The whole study is based on the knowledge creation theory (SECI model). SECI model is based upon four knowledge conversion modes chained into two aspects. The names of the four modes are internalization, externalization, combination, and socialization.

1. **Socialization (tacit → tacit)**

University teachers through sharing (experiences, thoughts, ideas, and opinions with each other) during a discussion, teamwork, and projects obtain the transfer of tacit knowledge from one person to another. O'Dell (1996) describes that sharing of knowledge is the most powerful means to increase personal insights as well as experiences of teachers. Knowledge sharing encourages and increases confidence in teachers who start their career afresh. The transferring of knowledge through sharing would be an effective approach if teachers are willing to share and utilize it in teaching and other activities (Amin, 2005). For the creation and sharing of knowledge, face-to-face discussion between staff is necessary (Nonaka and Takeuchi, 1995). Rismark, M., & Sølvberg, A. M. 2011 said the participation of teachers in knowledge sharing activities (discussion (formal and informal), teamwork, and joint projects) actually involves teachers in knowledge sharing activities that expand their own wisdom. According to Engerstorm (2011), the discussion involves the formation of concepts, thoughts, or ideas. Some other researchers such as (Webb & Blond, 1995; Mercer, 1995; Hiebert, Gallimore & Stigler, 2002; Carroll, Choo, Dunlap, Isenhour, Kerr, MacLean & Rosson, 2003; Berry, 2007) also agreed to the point that socialization has a positive impact on knowledge creation. Teachers share their experiences, ideas, concepts and opinions with each other. Some teachers like Deans, Heads of departments have authority to manage and hold things well In short socialization improves the knowledge creation activities as supported by Weir and Hutachings, 2005 that socialization is a natural process in the workplace

2. **Externalization (tacit → explicit)**

Externalization needs internal bound to support examples, such as giving others a complete understanding of something the examples and analogies help to describe tacit knowledge. Abstraction needs verbalization with the support of examples to provide others with complete understanding (Newman, Griffin, & Cole, 1989). The influence of outcomes of externalization is not an unknown function of knowledge creation (e.g., Chambers & Reisberg, 1985; Kirsh, 1995; Schwartz, 1995; Zhang, 1997). The externalization relates to the "trialogical" learning approach based on three foundations of learning metaphor called personal learning, teamwork, and collaborative knowledge creation (Paavola, Lipponen & Hakkarainen, 2004). Teachers in the new era are more expressive and have more tools and devices (multimedia) to

interact with the world and gain knowledge. In support of findings, some other researchers contribute to this study (Nonaka & Toyama, 2015; Gourlay, 2006; Shirouzu, Miyake & Masukawa. 2002; Huang & Wang, 2002; Dawson, 2014).

3. Combination (Explicit → Explicit)

The clearer, obvious, and more favorable form of explicit knowledge it is reworded. By means of combination, the pior-disconnected knowledge is connected with the existing one. (Buckley & Carter 1994). Knowledge combination is a kind of meta-data which refers to "description and information given about other data" (Marwick, 2001). Various researchers have indicated that the combination of existing knowledge is an essential practice for knowledge creation (Schumpeter, 1934; Kogut & Zander, 1992; Tsai, 2001; Nerkar, 2003). Recombination of knowledge is known as innovation (Schumpeter, 1934; Nelson & Winter, 1977; Dosi, 1982) The summary of any event is a kind of explicit knowledge that is recombined to avoid complexity (Tombros, Sanderson and Gray, 1998) with a more structured form (Marwick, 2001). The efficiency of a teacher increases knowledge combination activities like interaction and collaboration with new thoughts, structured concepts, and summaries in an accurate and professional manner (Hargreaves, 1999; Bae, Song & Kim, 2012; Hegarty, 2000; Lin, Lin, & Huang, 2008). In support of knowledge combination and positive influence of knowledge creation, some other research studies have been added (Schulze & Hoegl, 2006; Tolstoy, 2009; Li, Huang & Tsai, 2009; Shu, Page, Gao & Jiang, 2012; Menguc, Auh & Uslu, 2013).

4. Internalization (Explicit → tacit)

The internalization knowledge is a kind of "learning by doing" so learning practice is necessary (Nonaka &Takeuchi, 1995). Experience is based on tacit knowledge. People learn from personal experiences and the physical world around (Nonaka, Byosiere, Borucki, & Konno, 1994; Cong & Pandya, 2003). "The internalization and reflection go together with an understanding that reflection comprises a steadily but progressive transformation of genuinely discrete external social knowledge into embedded and personal knowledge (Kolb, 1984)". Teachers facilitate the internalization process of learning through experiences which they share with others (Hou, Sung & Chang, 2009). In support of knowledge, internalization promotes knowledge creation various research studies have been included (Nonaka & Konno, 1998; Nonaka & Toyama, 2015; Popadiuk & Choo, 2006; Shang, Li, Wu & Hou, 2011; Akbar, 2003).

2.8.1 Knowledge creation (entire SECI model) the overall picture

The externalization and socialization practice have more influence on university teachers than internalization and combination practices. Public university teachers do more practice of knowledge creation activities than private university teachers because public universities are larger in number in Pakistan. Glisby & Holden (2003), Weir and Hutchings (2005), Haag et al. (2010), and Andreeva & Ikhilchik (2011) support these findings and suggest that universality of knowledge creation (SECI model) is not global and the modes of knowledge creation (SECI model) have not equal worth in different cultures and sectors. In Pakistan all sectors move up to the collective level rather than individual level of knowledge creation practice (Saeed, Tayyab, Anis-Ul-Haque Ahmad & Chaudhry, 2010; Kanu, 2005; Alam, Ali & Subhan, 2015). Therefore, the findings of this study agree with Nonaka and Takeuchi, 1995 who believed that the externalization process is the primary means of knowledge creation. Another researcher (Kao et al. 2011) who believed that the progressive knowledge creation take place in the presence of organizational combination and internalization because the knowledge collected explicitly is helpful in generating new knowledge. It is not necessary as Nonaka and Takeuchi (1995) mentioned in their model that the SECI process starts with socialization whereas it can also start from internalization or combination. Various components of knowledge creation SECI model overlie and can be attached to multiple processes (Easa, 2012). The training session can be studied as the process of improving face-to-face discussions and externalization knowledge assists in the discussion by documenting them, or internalization knowledge delivers learning method and materials with outcomes of these sessions (Easa, 2012).

However, the leaders and teachers indicate that the SECI model is a helpful tool for an organization for knowledge management activities. This supports the findings of Nonaka et al. (2000) and Von Krogh et al. (2012).

2.8.2 Research evidence

Research studies on the performance of educational organizations with respect to knowledge creation based on the Spiral Theory of Knowledge Creation are quite rare internationally. In Pakistan, no research study has yet been conducted on knowledge creation practices in an educational institution especially at higher education level. The current study explores the knowledge practices applied by teachers using both tacit and explicit knowledge.

The sharing of knowledge capabilities of teachers enhances the knowledge creation of an organization with a sequential process of practice.

In organizations, knowledge exists in both tacit and explicit forms. While explicit knowledge is found in written formats, tacit knowledge exists in an individual's mind. This is the knowledge that an individual gains from personal experiences and exposure to certain skills. Therefore, organizations need to find out a way to harness the potential of tacit knowledge of their employees by providing them with an environment conducive for sharing and transferring of knowledge/ideas. Similarly, the function of universities is not limited to teaching practices happening in a classroom, but it also involves the processes that help promote knowledge creation.

Quite rarely can we find the application of the theory of knowledge creation or a research study on the knowledge creation practices in Higher Educational Institutions. A knowledge creation practice analyzes teachers' capabilities of managing knowledge strategically. Generally, the explicit knowledge used by teachers to express their knowledge is used as a source of knowledge creation. However, knowledge creation takes place with the structure of strategic management because knowledge creation involves systematical and sequential form so the abilities to manage knowledge strategically with core abilities are used to assess in university teachers by using the instrument of Nonaka theory.

Table 2.3

Research evidence from previous studies

Title	Researcher	Gap/differences	Similarities	National/ International
The application of SECI model as a framework of knowledge creation in virtual learning	Hosseini, 2011	• Qualitative research methodology • Semi-structured interviews • Respondents: Professional facilitators	• Area: Education sector • SECI Model	International

Title	Researcher	Gap/differences	Similarities	National/ International
Knowledge creation and conversion in military organizations: How the SECI model is applied within armed forces	Lis, 2014	• Area: military organizations	• SECI model	International
The Applicability of the SECI Model to Multiorganisational Endeavors: An Integrative Review	Rice & Rice, 2005	• Investigation of literature	• SECI model	International
Knowledge management and the entrepreneur: Insights from Ikujiro Nonaka's Dynamic Knowledge Creation model (SECI)	Bandera, Keshtkar, Bartolacci, Neerudu & Passerni, 2017	• Small and medium entrepreneurial firms • Mixed method research • Respondents: Entrepreneurs	• SECI model	International
Knowledge management and the SECI model: A study of innovation in the Egyptian banking sector	Easa, 2012	• Banking sector • Mixed method research	SECI model Analysis	International
Knowledge creation in universities and some related factors	Siadat, Haveida, Abbaszadeh & Moghtadaie, 2012		• Education sector • Universities • Faculty members • Quantitative research	International
Knowledge sharing in academia: A case study using a SECI model approach	Faith & Seeam, 2018	• Students	• Quantitative research • Staff/Faculty • SECI model	International

Title	Researcher	Gap/differences	Similarities	National/ International
Employee Involvement and the Knowledge Creation Process: An Empirical Study of Pakistani Banks	Bashir Memon, Syed & Arain, 2017	• Banking sector • Bank employees	• Quantitative • SECI model	National
Factors promoting knowledge sharing & knowledge creation in banking sector of Pakistan	Abbas, Rasheed, Habiba & Shahzad, 2013	• Banking sector • Bank employees	• Quantitative	National
Knowledge-Centered Culture and Knowledge-Oriented Leadership as the Key Enablers of Knowledge Creation Process: A Study of Corporate Sector in Pakistan	Ayub, Hassan, Hassan & Laghari, 2016	• Cooperate sector	• Quantitative	National

For researchers, knowledge is a favorite area because of the changing international trend marked by the transition from physical resources to knowledge resources. Internationally, many researchers study about knowledge creation in different sectors. Hosseini, 2011 conducted a research on knowledge creation by using Spiral knowledge creation theory, and used a qualitative research approach and semi-structured interviews for data collection from professional facilitators of the education sector. Travaille & Henriks, 2010 also researched on education sector by using the Nonaka Spiral theory of Knowledge creation to check out the success factor of knowledge creation in universities. The researchers used a qualitative approach along with stratified sampling technique. They also used interviews as a research instrument to get feedback from researchers, technicians and leaders of the research institutes of different universities.

Siadat, Haveida, Abbaszadeh & Moghtadaie, 2012 conducted a research study on knowledge creation using Nonaka's spiral theory of knowledge creation at the university level. Using quantitative approach, they gathered data from the faculty members of universities through a questionnaire. Faith's & Seeam's, 2018 research on knowledge sharing in academia

involves both students and teaching faculty as the respondents. They have also used a quantitative approach and applied Nonaka's spiral theory of knowledge creation.

As mentioned earlier, knowledge creation is not limited to education sector only; therefore, many researchers studied knowledge creation practices in sectors other than education. While using Nonaka's knowledge creation theory, Lis, 2014 studied knowledge creation and its conversion in military organizations. Rice & Rice, 2005 studies knowledge creation with the multi-organizational investigation through literature by using Nonaka's Knowledge creation theory. Bandera, Keshtkar, Bartolacci, Neerudu & Passerni, 2017 took small and medium entrepreneurial firms Easa, 2012 carried the banking sector and in both research mixed-method approach has been used.

In the Pakistani context, work on knowledge creation is limited in all aspects. A few researchers who have studied knowledge creation did their work in selected sectors, and all of them have used quantitative approach for their studies. Bashir Memon, Syed & Arain, 2017 took the banking sector and Abbas, Rasheed, Habiba & Shahzad, 2013 chose the banking sector while Ayub, Hassan, Hassan & Laghari, 2016 focused on cooperate sector.

To sum up, knowledge creation is an important area of research for today's researchers as it serves as one of the most important entities for both individuals and organizations for their survival and development. With the help of Nonaka's knowledge creation theory, the researchers can do their research work in all sectors and use different research methods and approaches. In Pakistan, only a few researchers have done their work in a few selected sectors, and majority of them have used quantitative research approach to study the knowledge creation processes in their selected domains.

2.9 Critical Summary

The chapter covered the history of knowledge creation in which the essence of knowledge and knowledge depreciation has been discussed. Knowledge has been started from an idea and every creation of knowledge is based on some concepts, ideas, insight, and experience. Furthermore, the up gradation of knowledge is very essential to achieve competitive advantages. The depreciation of knowledge means the price and value of existing objects and practices diminish over time because new objects or practices take the old ones place. Additionally, the

trend has been also changed from a resource-based view to a knowledge-based view that focused on human capital more than physical capital.

The demand for learning organizations has increased as the trend changed from a resource-based view to a knowledge-based view that focused on human capital more than physical capital. Learning organizations are those who have focused on updated and new knowledge to meet the competitive advantages. The learning organization helps to enhance organizational learning by creating structure, strategic filling, and strategic crafting. With innovative technologies, organizations learn continuously to enhance their knowledge assets to deal with future challenges.

Furthermore, leaders and managers play an important role in learning organizations. The organization has shifted its (leaders/managers) role from traditional to more innovative and broader to promote productive dialogues, ideas implementation, and experimentation than produce a competitive environment for knowledge creation activities.

The spiral theory of knowledge creation is based on epistemological and ontological dimensions; the idea shows epistemological while the social discussion shows the ontological dimension. The spiral theory of knowledge creation target three tiers of organization i.e. individual, group, and organization that shows the theory starts from the individual and lead towards collective knowledge creation. knowledge creation is continuous transfer, combination and conversion of the different types of knowledge, as users practice, interact, and learn. The theory has been based on four practices that convert tacit and explicit knowledge through a cyclic process. Socialization, externalization, combination, and internalization (explained before) are four knowledge-creation practices.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The entire methodology used in this study has been discussed in detail in this chapter. The chapter highlights research approach used for this study including research design based on research method, population, sampling unit, sample and sampling techniques, data collection, and statistical test used for the analysis.

3.2 Research Approach

The study is rooted in deductive reasoning that leads towards a quantitative research approach. There are two types of approaches in educational research that further represent the methods of research.

3.2.1 Research paradigm

As the current study is quantitative, therefore the positivism paradigm has been deemed suitable for the study. According to positivism experimental or survey method is the best to conduct a research study. In this paradigm, reality can be measured with the help of valid and reliable tools. The instrument used in this study is a questionnaire with close-ended items.

3.2.2 Research Design

On the basis of a particular research approach, a specific research design is selected. This way, a research method selected to conduct the study. Here cross-sectional study design has been opted for this study. The study is based on a single variable i.e. knowledge creation which is further chained with two sub-variables i.e. tacit and explicit knowledge. The questionnaire designed for the study consists of three sections: the first covers demographic aspects; the second deals with knowledge creation practices; and the third is about sources of knowledge explicitness (tacit knowledge and explicit knowledge). The questionnaire consists of close-ended items with coding by using Likert scale.

In a quantitative research approach, a researcher can use different research methods. Since this study refers to the description of the existing conditions/ status or the way things are, therefore, descriptive survey research method has been chosen to conduct the study.

3.3 Population

The universities of Rawalpindi and Islamabad have been selected for the study. A list of recognized universities was taken from the HEC website. From the list, both public and private sector universities have been considered to collect the data from the teaching faculty of universities. The table given in appendices mentions that 22 universities belonged to the public sector while 7 to the private sector.

The university employees (teaching faculty) have been taken as the population for the study. They are directly involved in knowledge-creating activities, management activities, knowledge creation practices and strategic management.

From twenty-nine selected universities, the Faculty of Social Sciences (SS) and Faculty of Natural Sciences (NS) has been selected as a population of the study which is thoroughly mentioned in the table below in appendix III. National University of Technology and Sir Syed Institute of Technology have been excluded because there were no relevant departments. The faculty constituted as the population of the study has been taken from Social Sciences and Natural Sciences departments of all the selected universities

Natural Sciences department used for this study include botany, physics, chemistry, biology (biosciences, bioinformatics, micro-biology, biological science), applied mathematics, applied statistics, bio chemistry, health information and health studies and metrology. The departments of Social Sciences are Social Sciences and humanities, media studies and communication (Mass communication), psychology, languages and literature (Arabic, Urdu, English, German), Architecture and design, Fine Arts, Islamic art, architecture and Economics (Islamic Economics, developmental economics and environmental economics), policies and IR, Women and Gender studies, Religion and Islamic studies, Pakistan studies, anthropology, Sociology, Law (Shariah), History, political science and peace and conflict studies.

The total population i.e. teaching faculty from the above-mentioned departments of public and private universities is 4289. Pilot testing was done in PMAS-ARID agriculture and

the National University of Computer & Emerging Science (FAST) so these two universities have been excluded from the procedure of data collection. After excluding the universities taken for pilot testing, the total population remains 4195.

3.4 Sampling Techniques

Sampling technique is a process of selecting a method which is used for choosing a sample size from the target population. For the sampling unit, convenient sampling has been used. Convenient sampling is a process of selecting subjects or units for examination and analysis that is based on accessibility, ease, speed and low cost. Units are not purposefully or strategically selected; therefore in this study, sampling units were selected through convenient sampling technique (Cochran, 1977). Convenient sampling, as its name suggests, involves selecting sample units that are readily accessible to the researcher (Lewis-beck, Bryman & Liao, 2003; Frey, 2018). The study is based on a stratified proportionate sampling technique in which two subgroups are taken with proportionate manners. The formula of stratified sampling is as follows:

Stratified sampling = <u>total sample size</u> × Population of Sub groups
                                    Entire population

To achieve an equal proportion, the sample was selected by dividing the whole population into the groups of public and private universities; Faculty of Natural Sciences and Social Sciences, and male and female members of the faculty.

Table 3.1

Proportion of Total population in startas

Total Population	Sectors		Faculties		Gender	
	Public Sector	Private Sector	Natural Sciences	Social Sciences	Male	Female
4195	3202	993	2391	1804	2265	1930
	77%	23%	57%	43%	54%	43%

The public sector faculty constitutes 77% population while the private sector makes up for 23% of the population. Faculty of Natural Sciences is 57% and Faculty of Social Sciences is 43%. Male respondents from total population are 54% and the female respondents are 43%.

3.5 Sample

3.4.1 Sampling unit

A total of 29 universities have been existed in Rawalpindi and Islamabad. Of these, 20 universities are from public sector while the remaining 9 universities are private sector universities. Two universities (1 public and 1 private) were not relevant (because of the absence of the Faculty of Natural Sciences and Social Sciences) and two (1 public and1 private) universities were used for pilot testing. After excluding four universities, the target institutions are 25. From these, 18 are public sector universities and 7 private sector universities. 11 institutions were selected as sampling units by using convenient sampling technique:, from these 7 universities are from public sector while 3 are from private sector.

3.4.2 Sample Size

The target population was N=4195 from the faculty Natural Sciences and Social Sciences. According to Gay, Mills, and Airasian, 2014 a smaller size of the sample is required for the largest size of population. They further said that a smaller size of the population where N=100 or lesser than that needs to take the whole population as a sample. As the population size increases, the sample size gets reduced. When the population N=500 then 50% population needs to be taken as a sample size. In case the population N=1500, then 20% is required to be taken as a sample size. For more than N=5000, 8% sample size is required for the study.

Table 3.2

Selection of Sample

Population	Sample size
100	Entire
500	50%
1500	20%
5000 or above	8%

Another formula that determines the sample size (n) is Slovin's Formula from known population (N) and acceptable error value (e). The formula was formulated by Slovin in 1960.

$$n = \frac{N}{1 + Ne^2}$$

n = 4195/1 + 4195 (0.05)^2

4195/ 1+4195 (0.0025)

4195/ 1+ 10.49

4195/11.49 = 365.10

The sample size of the study from the target population was approximately 503 or 12%. This is justified as per L. R. Gay book of Educational Research and Slovin's formula. The sample size reflects the number of obtained responses, and not necessarily, the number of questionnaire distributed. The most common and time effective way to ensure minimum samples is to increase the sample size (Bartlett et al., 2001). From the total sample size, we aim to take 17.7% of respondents from each selected university.

Table 3.3

Selected Sample from sampling unit

Sr.No.	Sampling Units	Sector	Population (Natural and Social Sciences)	17.7%
		PUBLIC		
1.	Baharia University	Public	352	62
2.	COMSATS Institute of Information Technology	Public	443	78
3.	Rawalpindi Medical University	Public	186	33
4.	International Islamic University (IIU)	Public	483	85
5.	National University of Modern Languages (NUML)	Public	363	58
6.	Quaid-i-Azam University (QAU)	Public	274	48
7.	University of Engineering & Technology, Taxila	Public	16	3
8.	Fatima Jinnah Women University	Public	136	24
		PRIVATE		
9.	Capital University of Science and Technology (CUST)	Private	34	6
10.	Riphah International University	Private	287	51
11.	Foundation University, Islamabad	Private	314	55
	Total			**503**

The sample size taken from each starta was in the same proportion as described in the proportion of total population.

Table 3.4

Sample from Stratas

Sample size	Sectors		Faculties		Gender	
	Public	Private	Natural Sciences	Social Sciences	Male	Female
503	391	112	287	216	272	231
100%	77%	23%	57%	43%	54%	46%

The stratified proportionate sampling technique shows that the proportion of the population of two groups should be the same as the sample size proportion to reduce the chance of error.

3.5 Instrument of the Study

In this study, questionnaire has been used to analyze knowledge creation practices of university teachers. In the theoretical framework, knowledge creation is chained with four factors that affect knowledge creation practices on the basis of tacit and explicit knowledge. The SECI model is widely approved particularly in management expertise because of the insightfulness and fine depiction of knowledge and its types (tacit and explicit), even though the philosophical touch in the SECI model creates difficulties in research (Rice & Rice, 2005; Hosseini, 2011; Lee & Kelkar, 2013; Mani, Mubarak & Choo, 2014). Some of the questions at the start of the questionnaire are based on background (demographic) information named Section 01, The section-02 consists of the questionnaire is on knowledge creation practices. It was developed by Huang &Wang, 2002 a professor and Vice Dean in NCCA College of Commerce in Taiwan. The Section-03 of the questionnaire is on knowledge source-knowledge explicitness. Gerard, 2003 who is working at New England University as an associate professor, developed it; both scales have been used with the permission of their owners. The questionnaire has sub-sections. In the second section, there were 4 sub-sections (internalization, externalization, socialization, and combination) that were related to the theory used in this research study, and the third section has no sub-sections.

3.5.1 Structure of the questionnaire

The questionnaire consisted of the following 3 sections:

Section 01is based on demographic data, Section 02 is related to knowledge creation practices and Section 03 is sources of knowledge explicitness: tacit and explicit

The questionnaire is based on 03 sections mentioned above. Section 01 inquired about background (demographic) information. Section 02 (knowledge creation practices) comprised 25 statements with 5 point rating responses each1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree. Section 03 (knowledge sources… explicit and tacit (knowledge explicitness)) comprised 38 statements with 5 point rating scale 1) Very little (2) Little (3) Some (4) Much (5) Very much.

In the theoretical framework, knowledge creation is chained with four factors that affect knowledge creation practices with the basis of tacit and explicit knowledge. The SECI model is widely approved particularly in management expertise because of the insightfulness and fine depiction of knowledge and its types (tacit and explicit), even though the philosophical touch in the SECI model creates difficulties in research (Rice & Rice, 2005; Hosseini, 2011; Lee & Kelkar, 2013; Mani, Mubarak & Choo, 2014).

3.5.2 Ethical considerations

While conducting the study, different ethical considerations were taken into account. The first and the foremost important consideration is the respect towards the study participants. It is because participants in the study form a foundation for different ethical principles. On the basis of ethical consideration, it is the right of the participants to be treated as human beings having the right to be treated in a significant manner. Generally, participants are not merely a way of collecting information.

Another ethical consideration followed in the study is the free will of target population for participation responding to the questionnaire of the study. Therefore, the decision of the participants was accepted with respect regardless of whether they want to be part of the study or not.

Another ethical consideration followed in the study is to take permission of the authors before using their research instrument in the study. In this study, standardized questionnaire has

been used; therefore, prior to using the instrument, the researcher took permission from the developers for using their questionnaire.

3.6 Pilot Testing

The questionnaire was standardized; therefore, pilot testing was not essential. However, there were cultural differences between the respondents to this questionnaire when used in different countries. The thoughts and culture of different countries create a difference in study and influence upon reliability and validity of the study.

In the pilot testing phase, two universities were taken. The questionnaire was distributed to the National University of Computer and Emerging Science (FAST), Islamabad (Private Sector University), and PMAS-Arid Agriculture University, Rawalpindi (Public Sector University). The participants were 94 respondents comprising the teaching faculty of both universities from natural science and social science departments. The rule of thumb is to conduct a survey on at least 12 to 50 respondents prior to pilot testing (Sheatsley, 1983; Sudman, 1983). Therefore, 20 respondents were selected for the pilot testing of the study.

3.6.1 Reliability of the Instrument

Reliability pertains to the level of uniformity or conformity of attributes that an instrument intends to measure. The coefficients of stability in reliability analysis are between 0 to 1. The following action lines are given to indicate reliability analysis:

Table 3.5

Coefficient of Stability for Reliability Analysis

Reliability	Coefficient of stability
0.9 and high	Excellent
In the middle of 0.9 and 0.8	Good
Within 0.8 and 0.7	Acceptable
In the range of 0.7 to 0.6	Questionable
Between 0.6 to 0.5	Poor
Down from 0.5	Unacceptable

The result of the reliability analysis of the measuring instrument defines the coefficient of stability by corresponding with each other.

Table 3.6

Reliability Analysis of Each Section of Questionnaire

Sr. No.	Variables	No of respondents	No. of items	Cronbach's Alpha	Coefficient of stability
01.	Internalization		05	0.76 or 76%	Acceptable reliability
02.	Externalization		07	0.78 or 78%	Acceptable reliability
03.	Socialization		07	0.78 or 78%	Acceptable reliability
		20			
04.	Combination		06	0.70 or 70%	Acceptable reliability
05.	Sources of Knowledge (knowledge Explicitness)		38	0.94 or 94%	Excellent reliability

The reliability analysis shows that overall reliability analyses were acceptable to conduct a survey for the conclusion.

3.6.2 Validity of the Instrument

"Validity refers to the extent an instrument measures what it is supposed to measure". The validity of the questionnaire has been done by experts. As the scales are standardized and match the criteria of the study, so only a few minor changes were made to match the area of study. The changes in the questionnaire mentioned above in the "instrument of the study.

Three experts validated the questionnaire. Validity involves the opinion of experts about the questionnaire items that the items exactly measure the conceptual area of the concept. As per experts, the questionnaire items match the conceptual area of the study.

3.7 Data Collection

The questionnaire was distributed to the teaching faculty of 11 universities from which 8 were public-sector universities while 3 were private-sector universities. The sample size comprised 503 or 12% of a total population of selected departments of Faculty of Natural Sciences and Social Sciences. The questionnaire consisted of questions about the practices of knowledge creation (Socialization, Externalization, Combination, and Internalization) and

explicitness of knowledge. The data was collected by visiting different universities. Received responses were 495 or 11.8% responses from respective respondents.

3.8 Data Analysis

The data has been analyzed using several statistical techniques according to the objectives of the study.

Table 3.7

Selected Statistical Techniques for Each Objective

Sr.No.	Objectives, Hypotheses and Research Questions	Tests
01.	To explore the status of knowledge creation practices (SECI) of university teachers. Research Question: To what extent do the university teachers utilize the knowledge creation practices?	Mean Values
02.	To explore the source of explicitness of university teachers. Research Question: What sources of knowledge explicitness did university teachers more frequently use?	Mean Value
03.	To compare the knowledge creation practices (SECI) of Public and Private University teachers. $H0_1$: There is no difference between public and private university teachers knowledge creation practices	Independent t-test: Means, F-stat for Levene test, z test (n<30= t-test, n>30 = Z-test)
04.	To compare the knowledge creation practices (SECI) of Faculty of Natural Sciences and Faculty of Social Sciences $H0_2$: There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences knowledge creation practices	Independent t-test: Means, F-stat for Levene test, z test (n<30= t-test, n>30 = Z-test)
05.	To compare the knowledge creation practices (SECI) of Male and Female University teachers. $H0_3$: There is no difference between male and female university teachers knowledge creation practices	Independent t-test: Means, F-stat for Levene test, z test (n<30= t-test, n>30 = Z-test)

Sr.No.	Objectives, Hypotheses and Research Questions	Tests
06.	To compare the sources of knowledge explicitness of Public and Private University teachers. H0$_4$: There is no difference between public and private university teachers using of sources of knowledge explicitness.	Independent t-test: Means, F-stat for Levene test, z test (n<30= t-test, n>30 = Z-test)
07.	To compare the sources of knowledge explicitness of Faculty of Natural Sciences and Faculty of Social Sciences. H0$_5$: There is no difference between the Faculty of Natural Sciences and Faculty of Social Sciences using of sources of knowledge explicitness.	Independent t-test: Means, F-stat for Levene test, z test (n<30= t-test, n>30 = Z-test)
08.	To compare the sources of knowledge explicitness of Male and Female university Teachers. H0$_6$: There is no difference between male and female university teachers using of sources of knowledge explicitness.	Independent t-test: Means, F-stat for Levene test, z test (n<30= t-test, n>30 = Z-test)

3.9 Summary

The chapter has discussed the entire research methodology used for the study. The study is quantitative in nature; therefore, the best suited research paradigm i.e. positivism was used. According to positivism, a survey or experimental methods are used to conduct research. For that reason, survey method has been used for the study. The population of the study consisted of the faculty of natural and Social Sciences of the universities located in Rawalpindi and Islamabad. The total population is 4195 and the sample size is 503. A stratified proportionate sampling technique was used for the study. The instrument used in the study was standardized. The questionnaire was handed over to respondents and 495 respondents returned the questionnaire. For the analysis, descriptive statistics and independent t-test have been used.

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┌──────────────────────┐         ┌──────────────────────────┐
│ Research approach    │ ──────> │ Research method          │
│ Quantitative         │         │ Descriptive survey method│
└──────────────────────┘         └──────────────────────────┘

┌──────────────────────┐         ┌──────────────────────────────────────────┐
│ Respondents          │ <────── │ Population                                 │
│ University teachers  │         │ Faculty of Natural Sciences and Social    │
│ Total = 7625         │ ──────> │ Sciences                                   │
└──────────────────────┘         │ N = 4195                                   │
                                 └──────────────────────────────────────────┘

┌────────────────────────────────────────────────┐   ┌──────────────────────────────┐
│ Selected universities (sampling units) = 11     │   │ Sample                        │
│ (Strata)                                         │<─>│ n = 503 (17.7% from each      │
│ Public = 8                                       │   │ sampling unit)                │
│ Private 3                                        │   │ Sampling technique            │
└────────────────────────────────────────────────┘   └──────────────────────────────┘
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| PUBLIC Baharia = 352 NS = 281 SS = 71 | PUBLIC Comsats= 443 NS = 317 SS = 126 | PUBLIC NUML= 326 NS = 17 SS = 309 | PUBLIC QAU = 274 NS = 158 SS = 116 | PUBLIC IIUI = 483 NS = 112 SS = 371 | PUBLIC RMC = 186 NS = 186 SS = -- |

| PUBLIC UET = 16 NS = -- SS = 16 | PUBLIC FJWU = 136 NS = 28 SS = 108 | PRIVATE FUI= 314 NS = 240 SS = 74 | PRIVATE CUST= 34 NS = 34 SS = -- | PRIVATE Riphah = 287 NS = 260 SS = 27 |

```
┌──────────────────┐    ┌──────────┐    ┌────────────┐    ┌──────────────────────────┐
│ INSTRUMENT       │───>│ Pilot    │───>│ Data       │───>│ Data Analysis            │
│ Questionnaire    │    │ Testing  │    │ Collection │    │ Descriptive Statistic    │
└──────────────────┘    └──────────┘    └────────────┘    │ Independent t-test       │
                                                          └──────────────────────────┘
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Figure 3.1. Framework of the methodology

CHAPTER 4

ANALYSIS AND INTERPRETATION OF DATA

4.1 Introduction

The data that has been gathered with the help of a research instrument will be analyzed and interpreted in chapter 4 titled, "analysis and interpretation of data". The analysis has been done with the help of the SSPS program. Data analysis and interpretation have been presented in this chapter. The level of significance for the test applied in this chapter is 0.05.

4.2 Knowledge Creation Practices of University Teachers

The first objective of the study is related to knowledge creation process that includes four practices (internalization, externalization, socialization, and combination). All the statements related to these four practices were divided into separate sections with their interpretations. In the end, one more table has been given in which the cumulative values of all four practices are mentioned to show the status of knowledge creation of teachers with aggregate values of knowledge creation.

Objective 01: To explore the status of knowledge creation practices (SECI) of university teachers

Table 4.1

Results Knowledge Creation Practices of University Teachers

Knowledge creation practices	Minimum	Maximum	Mean
Cumulative mean value of Internalization	3.00	5.00	4.29
Cumulative mean value of Externalization	4.00	5.00	4.41
Cumulative mean value of Socialization	4.00	5.00	4.38
Cumulative mean value of Combination	3.00	5.00	4.35
Knowledge creation mean value		**4.337**	

In this table, descriptive statistics have been applied to find out the status of teachers knowledge creation practices at university level. Total respondents were 495.

"Internalization (explicit knowledge to tacit knowledge)": The cumulative mean value of internalization was 4.287 and the responses range from 3.00 to 5.00.

"Externalization (tacit knowledge to explicit knowledge)": The cumulative mean value of externalization was 4.408 and the responses range from 4.00 to 5.00.

"Socialization (tacit knowledge to tacit knowledge)": The cumulative mean value of socialization was 4.380 and the responses range from 4.00 to 5.00.

"Combination (explicit knowledge to explicit knowledge)": The cumulative mean value of combination was 4.354 and the responses range from 3.00 to 5.00

Knowledge creation (KC): The cumulative values were obtained with the collection of four sections altogether (internalization, externalization, socialization and combination). The knowledge creation (KC) cumulative mean value came to be 4.337.

4.3 Sources of Knowledge Explicitness of University Teachers

The second objective of the study was related to the sources of explicitness. Explicitness sources are the sources of knowledge or information that provide clarity to knowledge. Sources of explicitness refer to the sources that are used to enhance the present knowledge. To what extent are the teachers expressive and what source do they use to express themselves?

Objective 02: To explore the sources of knowledge explicitness of university teachers.

Table 4.2

Results of Source of Knowledge Explicitness of University Teachers

Sr. No	Sources of Explicitness	Minimum	Maximum	Mean
1.	Newspapers or news	2.00	5.00	4.07
2.	Journals	3.00	5.00	4.06
3.	Articles	3.00	5.00	4.15
4.	Stories	2.00	5.00	3.96
5.	Popular educational magazine	2.00	5.00	4.05
6.	Course textbooks	3.00	5.00	4.01
7.	An educational course	3.00	5.00	4.15
8.	Case studies	3.00	5.00	4.01
9.	Education related games	2.00	5.00	4.07
10.	Interviews of people in education-related situation	2.00	5.00	3.93
11.	Team/group exercises	2.00	5.00	4.10
12.	Giving presentations	2.00	5.00	3.95
13.	Listening to presentations	2.00	5.00	4.13
14.	In-class discussions about current events	2.00	5.00	3.97
15.	Seniors lectures	3.00	5.00	4.15
16.	Student discussion	2.00	5.00	3.98
17.	Individual study	2.00	5.00	4.13
18.	Listening to educational experts	3.00	5.00	4.00
19.	Course projects	2.00	5.00	4.10
20.	Personal experiences	3.00	5.00	3.99
21.	Student sharing of experiences	2.00	5.00	4.10
22.	Other personal life experiences	2.00	5.00	4.00
23.	Reports	2.00	5.00	4.06
24.	Emails	1.00	5.00	4.03
25.	Thinking about Education	2.00	5.00	4.06
26.	Personal insight	2.00	5.00	4.00
27.	Others insight about Education	3.00	5.00	4.06
28.	Statement made by authorities	2.00	5.00	4.07
29.	Education related shows	3.00	5.00	4.05
30.	Popular educational books	3.00	5.00	3.98
31.	Working with other people	3.00	5.00	4.09
32.	Education internship	3.00	5.00	4.01
33.	Listening to educational leaders	2.00	5.00	4.08
34.	Body language	2.00	5.00	3.99
35.	Comparison of multiple educational institutions	2.00	5.00	4.07
36.	Lengthy educational conversations	2.00	5.00	4.07
37.	Visual information (i.e., charts, diagram, figures, pictures)	1.00	5.00	4.10
38.	Degree program in education	3.00	5.00	4.11
	Cumulative mean value of sources of explicitness	**4.099**		

In this table, descriptive statistics have been applied to find out the status of teachers' knowledge creation practices at the university level. Total respondents were 495.

The table shows that the much-used sources of explicitness were articles, an educational course, and senior lectures. The mean value of articles was 4.15 and the responses range was 3.00 to 5.00; the mean value of educational course was 4.15 and the responses range was 3.00 to 5.00, and the mean value of senior's lectures was 4.15 and the responses range was 3.00 to 5.00.

The mean value of listening to presentations and the individual study was 4.13 and the responses range was 2.00 to 5.00. The mean value of the degree in education was 4.10 and the responses range was 3.00 to 5.00. The mean value of team/ group exercises and course projects was 4.10 and the responses range was 2.00 to 5.00. The mean value of visual information was 4.10 and the responses range was from 1.00 to 5.00. The mean value of working with other people was 4.09 and the responses range was 3.00 to 5.00. The mean value of listening to other leaders was 4.08 and the responses range was 2.00 to 5.00. The mean value of newspaper or news, education-related games, the statement made by authorities, comparison of multiple educational institutions, and lengthy educational conversations was 4.07 and the responses range was 2.00 to 5.00. The mean value of journals and other insights about education was 4.06 and the responses range was 3.00 to 5.00. The mean value of reports and thinking about education was 4.06 and the responses range was 2.00 to 5.00. The mean value of education-related shows was 4.05 and the responses range was 3.00 to 5.00. The mean value of popular educational magazine was 4.05 and the responses range was 2.00 to 5.00. The mean value of emails was 4.03 and the responses range was 1.00 to 5.00. The mean value of course textbooks, case studies and education internship was 4.01 and the responses range was 3.00 to 5.00. The mean value of listening to educational experts was 4.00 and the responses range was 3.00 to 5.00. The mean value of other personal life experiences and personal insights was 4.00 and the responses range was 3.00 to 5.00. The mean value of the personal experience was 3.99 and the responses range was 3.00 to 5.00. The mean value of body language was 3.99 and the responses range was 2.00 to 5.00. The mean value of popular educational books was 3.98 and the responses range was 3.00 to 5.00. The mean value of student discussion was 3.98 and the responses range was 2.00 to 5.00. The mean value of in-class discussions about current events was 3.97 and the responses range was 2.00 to 5.00. The mean value of stories was 3.96 and the responses range was 2.00 to 5.00. The mean value of giving presentations was 3.95 and the responses range was 2.00 to 5.00. The

mean value of interviews of people in the education-related situation was 3.93 and the responses range was 2.00 to 5.00.

The cumulative mean value of the sources of explicitness (knowledge explicitness) was 4.099.

4.4 Sector Wise Comparison of Knowledge Creation Practices of University Teachers (Public and Private Universities)

The third objective is about the comparison between public and private university teachers' knowledge creation practices.

Independent t-test has been applied in table 4.3 that compares the two groups. Independent t-test comes with two tables: the first one is group statistics and the second one is independent sample statistics. Levene's test is used to test if k samples have equal variances. Equal variances across samples are called homogeneity of variance. Same statistical tests, for example the analysis of variance, assume that variances are equal across groups or samples. The Levene's test was used to verify that assumption.

Objective 03: To compare the knowledge creation practices (SECI) of Public and Private University teachers.

H_1: There is no difference between public and private university teachers in their knowledge creation practices

H_{1a}: There is no difference between public and private university teachers in terms of internalization of knowledge creation practice.

H_{1b}: There is no difference between public and private university teachers in terms of externalization of knowledge creation practice.

H_{1c}: There is no difference between public and private university teachers in terms of socialization of knowledge creation practice.

H_{1d}: There is no difference between public and private university teachers in terms of combination of knowledge creation practice.

Table 4.3

Results of Comparison of knowledge creation practices of public and private university teachers

	Group Statistics				Levene's Test for Equality of Variances		T-Test		
	Universities	N	Mean		F	sig.	T	Df	Sig. (2-tailed
Internalization	Public	391	4.34	Equal Variances assumed	2.80	0.09	2.92	493	0.00
	Private	104	4.23	Equal Variances not assumed			2.85	156.92	0.01
Externalization	Public	391	4.47	Equal Variances assumed	12.25	0.00	1.18	493	0.24
	Private	104	4.44	Equal Variances not assumed			0.91	125.26	0.36
Socialization	Public	391	4.48	Equal Variances assumed	4.62	0.03	1.18	493	0.00
	Private	104	4.39	Equal Variances not assumed			0.91	129.54	0.01
Combination	Public	391	4.47	Equal Variances assumed	5.55	0.02	1.36	493	0.17
	Private	104	4.43	Equal Variances not assumed			1.14	133.21	0.26
Knowledge creation (Cumulative)	Public	391	4.45	Equal Variances assumed	12.79	0.00	3.31	493	0.00
	Private	104	4.38	Equal Variances not assumed			2.41	120.33	0.01

In the group statistics box for the knowledge creation practices found in public and private universities, the number of public universities was 8 and of private universities was 2. The respondents were 391 and 104 from public universities and private universities respectively.

The knowledge creation practice was categorized into four groups based on tacit and explicit knowledge.

1. Internalization (explicit to tacit)

2. Externalization (tacit to explicit)

3. Socialization (tacit to tacit)

4. Combination (explicit to explicit)

1. Internalization (explicit to tacit)

The cumulative comparison of knowledge creation (internalization (explicit to tacit)), between public universities with 391 respondents and private universities with 104 respondents was made. The mean of public universities was 4.336 and the mean of private universities was 4.233. It shows there is little difference between public and private universities.

The cumulative comparison (public and private universities) of knowledge creation, (internalization (explicit to tacit)) included "internalization" statements about knowledge creation practices which were cumulatively used to compare sample means as is shown below:

The outcomes of the independent samples test table contained two rows:

a. Equal variance assumed; and

b. Equal variance not assumed

The F value of Levene's test was 2.799 with the Sig. (p) value was 0.095. As shown in table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that $t_{(493)} = 2.917$, $p < 0.004$ because the Sig. (p) value is lower than our alpha 0.05. It shows that there is significant difference between the public and private universities regarding knowledge creation practices (internalization).

2. Externalization (tacit to explicit)

The cumulative comparison of knowledge creation (externalization (tacit to explicit)), between public universities with 391 respondents and private universities with 104 respondents was made. The mean of public universities was 4.468 and the mean of private universities was 4.441. It means there is little difference between public and private universities.

The cumulative comparison (public and private universities) of knowledge creation (externalization (explicit to tacit)) also included "externalization" statements about knowledge creation practices cumulatively used to compare sample means as showed in the following lines:

The outcomes of the independent samples test table contained two rows:

a. Equal variance assumed; and

b. Equal variance not assumed

The F value of Levene's test was 12.250 with the Sig. (p) value was 0.001. As shown in table that Sig. (p) value of Levene's test was lower than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that t $_{(125.255)}$ = 0.911, p > 0.364 because the Sig. (p) value was greater than our alpha 0.05 shows that there was no significant difference between the public and private universities knowledge creation practices (externalization).

3. Socialization (tacit to tacit)

The cumulative comparison of knowledge creation (socialization (tacit to tacit)), between public universities with 391 respondents and private universities with 104 respondents was made.The mean of public universities was 4.482 and the mean of private universities was 4.392, which shows that there is little difference between public and private universities.

The cumulative comparison (public and private universities) of knowledge creation (socialization (tacit to tacit)) included "socialization" statements about knowledge creation practices which were cumulatively used to compare sample means as show below:

The outcomes in the independent samples test table contained two rows:

a. Equal variance assumed; and

b. Equal variance not assumed

The F value of Levene's test was 4.624 with the Sig. (p) value was 0.032. As shown in table that Sig. (p) value of Levene's test was lower than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that t $_{(129.542)}$ = 2.887, p < 0.005 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was significant difference between the public and private universities knowledge creation practices (socialization).

4. Combination (explicit to explicit)

The cumulative comparison of knowledge creation (socialization (tacit to tacit)), between public universities with 391 respondents and private universities with 104 respondents was made. The mean of public universities was 4.465 and the mean of private universities was 4.430. It shows some difference between public and private universities.

The cumulative comparison (public and private universities) of knowledge creation (combination (explicit to explicit)) included "combination" statements about knowledge creation practices which were cumulatively used to compare sample means as showed below:

The outcomes in the independent samples test table contained two rows:

    a. Equal variance assumed; and

    b. Equal variance not assumed

The F value of Levene's test was 5.553 with the Sig. (p) value was 0.019. As shown in table that Sig. (p) value of Levene's test was smaller than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that $t_{(133.213)} = 1.136$, $p > 0.258$ because the Sig. (p) value was greater than our alpha 0.05 shows that there was no significant difference between the public and private knowledge creation practices (combination).

Cumulative Knowledge Creation

The cumulative comparison of knowledge creation (knowledge creation (combing four categories)), between public universities with 391 respondents and private universities with 104 respondents was made. The mean of public universities was 4.445 and the mean of private universities was 4.383, which means there is difference between the public and private universities.

The cumulative comparison (public and private universities) of knowledge creation included all statements (internalization, externalization, socialization and combination) about knowledge creation practices which were cumulatively used to compare sample means as shown below:

The outcomes in the independent samples test table contained two rows:

    a. Equal variance assumed; and

b. Equal variance not assumed

The F value of Levene's test was 12.793 with the Sig. (p) value was 0.000. As shown in table that Sig. (p) value of Levene's test was lower than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that t $_{(120.329)}$ = 2.408, p < 0.018 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was significant difference between the public and private universities knowledge creation practices.

4.5 Faculty wise Comparison of Knowledge Creation Practices of University Teachers (Natural Sciences and Social Sciences)

The fourth objective is about the comparison between the Faculty of Natural Sciences and Social Sciences with respect to their knowledge creation practices.

Independent t-test has been applied in table 4.4 that compares the two groups. Independent t-test comes with two tables: the first one is group statistics and the second one is independent sample statistics. Levene's test was used to test if k samples have equal variances. Equal variances across samples are called homogeneity of variance. Same statistical tests, for example the analysis of variance, assume that variances are equal across groups or samples. The Levene's test was used to verify that assumption.

Objective 04: To compare the knowledge creation practices (SECI) of Faculty of Natural Sciences and Faculty of Social Sciences.

H_2: There is no difference between faculty of natural sciences and faculty of social sciences in their knowledge creation practices

H_{2a}: There is no difference between faculty of natural sciences and faculty of social sciences in terms of internalization of knowledge creation practice.

H_{2b}: There is no difference between faculty of natural sciences and faculty of social sciences in terms of externalization of knowledge creation practice.

H_{2c}: There is no difference between faculty of natural sciences and faculty of social sciences in terms of socialization of knowledge creation practice.

H_{2d}: There is no difference between faculty of natural sciences and faculty of social sciences in terms of combination of knowledge creation practice.

Table 4.4

Results of the Comparison of knowledge creation practices of Faculty of Natural Sciences and Faculty of Social Sciences

	Group Statistics				Levene's Test for Equality of Variances		T-Test		
	Facilities	N	Mean		F	Sig.	T	Df	Sig. (2-tailed
Internalization	NS	282	4.34	Equal Variances assumed	104.93	0.00	7.67	493	0.00
	SS	213	4.16	Equal Variances not assumed			7.67	399.29	0.00
Externalization	NS	282	4.51	Equal Variances assumed	0.62	0.43	5.61	493	0.00
	SS	213	4.44	Equal Variances not assumed			5.61	490.76	0.00
Socialization	NS	282	4.51	Equal Variances assumed	7.67	0.01	11.77	493	0.00
	SS	213	4.35	Equal Variances not assumed			11.77	448.18	0.00
Combination	NS	282	4.55	Equal Variances assumed	19.25	0.00	9.24	493	0.00
	SS	213	4.38	Equal Variances not assumed			9.24	470.39	0.01
Knowledge creation (Cumulative)	NS	282	4.48	Equal Variances assumed	11.02	0.00	13.98	493	0.01
	SS	213	4.34	Equal Variances not assumed			13.98	491.97	0.00

In the group statistics box, the knowledge creation practices comparison between Faculty of Natural Sciences and Faculty of Social Sciences, the number of Natural Sciences faculty was 282 and the number of Social Sciences faculty was 213.

The knowledge creation practice was categorized into four groups based on tacit and explicit knowledge.

1.   Internalization (explicit to tacit)

2.   Externalization (tacit to explicit)

3.   Socialization (tacit to tacit)

4.   Combination (explicit to explicit)

1.   Internalization (explicit to tacit)

The cumulative comparison between Faculty of Social Sciences and Faculty of Natural Sciences regarding knowledge creation practices (internalization (explicit to tacit)) was made. The mean value of Faculty of Natural Sciences was 4.343 and the mean value of social science was 4.157. The mean value of natural science was higher than the mean value of Social Sciences.

The outcomes in the independent samples test table contained two rows:

a.   Equal variance assumed; and

b.   Equal variance not assumed

The F value of Levene's test was 0.865 with the Sig. (p) value of 0.000. As shown in the table that Sig. (p) value of Levene's test was lower than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that $t_{(471.536)} = 7.672$, $p < 0.000$ because the Sig. (p) value is lower than our alpha 0.05 shows that there is a significant difference between the Faculty of Social Sciences and Faculty of Natural Sciences knowledge creation practices (internalization).

2.   Externalization (tacit to explicit)

The cumulative comparison between Faculty of Social Sciences and Faculty of Natural Sciences of knowledge creation practices (externalization (tacit to explicit)), the mean value of Faculty of Natural Sciences was 4.505 and the mean value of social science was 4.444. The mean value of natural science was higher than the mean value of Social Sciences.

The outcomes in the independent samples test table contained two rows:

a.   Equal variance assumed; and

b.   Equal variance not assumed

The F value of Levene's test was 0.622 with the Sig. (p) value of 0.431. As shown in the table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that t $_{(558)}$ = 5.607, p < 0.000 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was a significant difference between Faculty of Social Sciences and Faculty of natural science knowledge creation practices.

3. Socialization (tacit to tacit)

The cumulative comparison between Faculty of Social Sciences and Faculty of Natural Sciences (socialization (tacit to tacit)), was made. The mean value of Faculty of Natural Sciences was 4.510 and the mean value of Faculty of Social Sciences was 4.347. The mean value of natural science was higher than the mean value of Social Sciences.

The outcomes in the independent samples test table contained two rows:

      a.   Equal variance assumed; and

      b.   Equal variance not assumed

The F value of Levene's test was 7.668 with the Sig. (p) value of 0.006. As shown in the table that Sig. (p) value of Levene's test was smaller than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that t $_{(504.519)}$ = 11.765, p < 0.000 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was a significant difference between the Faculty of Social Sciences and Faculty of Natural Sciences knowledge creation practices (socialization).

4. Combination (explicit to explicit)

The cumulative comparison between Faculty of Social Sciences and Faculty of Natural Sciences knowledge about creation practices (combination (explicit to explicit)) was made.

The mean value of Faculty of Natural Sciences was 4.548 and the mean value of social science was 4.381. The mean value of natural science was higher than the mean value of Social Sciences.

The outcomes in the independent samples test table contained two rows:

      a.   Equal variance assumed; and

      b.   Equal variance not assumed

The F value of Levene's test was 19.245 with the Sig. (p) value of 0.001. As shown in the table that Sig. (p) value of Levene's test was smaller than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that t $_{(532.518)}$ = 9.244, p < 0.014 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was a significant difference between the Faculty of Social Sciences and Natural Sciences knowledge creation practices (combination).

Cumulative Knowledge Creation

The cumulative comparison between Faculty of Social Sciences and Faculty of Natural Sciences regarding knowledge creation practices (internalization, externalization, socialization, and combination) was made to compare sample means as shown below:

The mean value of Faculty of Natural Sciences was 4.484 and the mean value of Faculty of Social Sciences was 4.344. The mean value of Natural Sciences was higher than the mean value of Social Sciences.

The outcomes in the independent samples test table contained two rows:

      a.   Equal variance assumed; and

      b.   Equal variance not assumed

The F value of Levene's test was 11.024 with the Sig. (p) value was 0.001. As shown in the table that Sig. (p) value of Levene's test was smaller than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that t $_{(557.069)}$ = 13.984, p < 0.001 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was a significant difference between the Faculty of Social Sciences and Faculty of Natural Sciences knowledge creation practices.

4.6 Gender Wise Comparison of Knowledge Creation Practices of University Teachers

The fifth objective is about the comparison between male and female teachers' knowledge creation practices.

Independent t-test has been applied in table 4.5 that compares the two groups. Independent t-test comes with two tables: the first one is group statistics and the second one is independent sample statistics. Levene's test was used to test if k samples have equal variances. Equal variances across samples are called homogeneity of variance. Same statistical tests, for example the analysis of variance, assume that variances are equal across groups or samples. The levene test used to verify that assumption.

Objective 05: To compare the knowledge creation practices (SECI) of Male and Female University teachers.

H_3: There is no difference between male and female university teachers in their knowledge creation practices

H_{3a}: There is no difference between male and female university teachers in terms of internalization of knowledge creation practice.

H_{3b}: There is no difference between male and female university teachers in terms of externalization of knowledge creation practice.

H_{3c}: There is no difference between male and female university teachers in terms of socialization of knowledge creation practice.

H_{3d}: There is no difference between male and female university teachers in terms of combination of knowledge creation practice.

Table 4.5

Results of the Comparison of knowledge creation practices of male and female university teachers

	Group Statistics				Levene's Test for Equality of Variances		T-Test		
	Gender	N	Mean		F	Sig.	T	Df	Sig. (2-tailed
Internalization	Male	267	4.33	Equal Variances assumed	0.87	0.35	-0.63	493	0.53
	Female	228	4.35	Equal Variances not assumed			-0.65	460.01	0.52
Externalization	Male	267	4.46	Equal Variances assumed	0.02	0.88	-3.09	493	0.00
	Female	228	4.53	Equal Variances not assumed			-3.17	447.19	0.00
Socialization	Male	267	4.46	Equal Variances assumed	0.09	0.77	-2.32	493	0.02
	Female	228	4.53	Equal Variances not assumed			-2.49	454.06	0.01
Combination	Male	267	4.46	Equal Variances assumed	4.57	0.03	-1.24	493	0.22
	Female	228	4.50	Equal Variances not assumed			-2.49	475.00	0.15
Knowledge creation (Cumulative)	Male	267	4.43	Equal Variances assumed	2.80	0.09	-2.62	493	0.01
	Female	228	4.49	Equal Variances not assumed			-0.65	484.68	0.00

In the group statistics box, for the knowledge creation practices between male and female, the number of male respondents was 267 and the female respondents were 228.

The knowledge creation practice was categorized into four groups based on tacit and explicit knowledge.

1. Internalization (explicit to tacit)
2. Externalization (tacit to explicit)
3. Socialization (tacit to tacit)
4. Combination (explicit to explicit)

1. Internalization (explicit to tacit)

The cumulative comparison of knowledge creation (internalization (explicit to tacit)), between male and female was made. The mean of male was 4.33 and the mean of female was 4.35.It means there is slight difference between the female and male.

The cumulative comparison (male and female) of knowledge creation (internalization (explicit to tacit)) included "internalization" statements about knowledge creation practices which were cumulatively used to compare sample means as shown below:

The outcomes in the independent samples test table contained two rows:

    a. Equal variance assumed; and

    b. Equal variance not assumed

The F value of Levene's test was 0.865 with the Sig. (p) value was 0.353. As shown in table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that t $_{(493)}$ = -0.630, p > 0.529 because the Sig. (p) value is greater than our alpha 0.05 shows that there is no significant difference between the male and female knowledge creation practices (internalization).

2. Externalization (tacit to explicit)

The cumulative comparison of knowledge creation (externalization (explicit to tacit)), between male and female was made. The mean of male was 4.46 and the mean of female was 4.53, which shows that there is little difference between female and male.

The cumulative comparison (male and female) of knowledge creation (externalization (tacit to explicit)) included "externalization" statements about knowledge creation practices which were cumulatively used to compare sample means as showed in the following lines:

The outcomes in the independent samples test table contained two rows:

    a. Equal variance assumed; and

b. Equal variance not assumed

The F value of Levene's test was 0.024 with the Sig. (p) value was 0.878. As shown in table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that t $_{(493)}$ = -3.098, p < 0.002 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was significant difference between the male and female knowledge creation practices (externalization).

3. Socialization (tacit to tacit)

The cumulative comparison of knowledge creation (Socialization (tacit to tacit)), between male and female was made. The mean of male was 4.46 and the mean of female was 4.52. It shows that there is little difference between female and male.

The cumulative comparison (male and female) of knowledge creation (socialization (tacit to tacit)) included "socialization" statements about knowledge creation practices which were cumulatively used to compare sample means as shown below:

The outcomes in the independent samples test table contained two rows:

a. Equal variance assumed; and
b. Equal variance not assumed

The F value of Levene's test was 0.085 with the Sig. (p) value was 0.771. As shown in table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that t $_{(493)}$ = -2.323, p < 0.021 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was significant difference between the male and female knowledge creation practices (socialization).

4. Combination (explicit to explicit)

The cumulative comparison of knowledge creation (combination (explicit to explicit)), comparison between male and female was made. The mean of male was 4.43 and the mean of female was 4.50,which means there is slight difference between female and male.

The cumulative comparison (male and female) of knowledge creation (combination (explicit to explicit)) included "combination" statements about knowledge creation practices which were cumulatively used to compare sample means as shown below:

The outcomes in the independent samples test table contained two rows:

    a. Equal variance assumed; and

    b. Equal variance not assumed

The F value of Levene's test was 4.574 with the Sig. (p) value was 0.033. As shown in table that Sig. (p) value of Levene's test was smaller than our alpha 0.05 so we took "Equal Variances not Assumed" for t-statistics. The t-statistics showed that t $_{(474.998)}$ = -1.444, p > 0.151 because the Sig. (p) value was greater than our alpha 0.05 shows that there was no significant difference between the male and female knowledge creation practices (combination).

Cumulative Knowledge Creation

The cumulative comparison of knowledge creation (knowledge creation (combining four categories)) between male and female was used. The mean of male was 4.43 and the mean of female was 4.49.This shows there is slight difference between female and male as female teachers are more involved more in knowledge creation practices than male teachers.

The cumulative comparison (male and female) of knowledge creation included all statements (internalization, externalization, socialization and combination) about knowledge creation practices which were cumulatively used to compare sample means as shown below:

The outcomes in the independent samples test table contained two rows:

    a. Equal variance assumed; and

    b. Equal variance not assumed

The F value of Levene's test was 2.804 with the Sig. (p) value was 0.095. As shown in table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that t $_{(493)}$ = -2.617, p < 0.009 because the Sig. (p) value was smaller than our alpha 0.05 shows that there was significant difference between the male and female knowledge creation practices.

4.7 Sector Wise Comparison of Sources of Knowledge Explicitness of University Teachers (Public and Private Universities)

The sixth objective is about the comparison between public and private university teachers with respect to the sources of explicitness.

Independent t-test has been applied in table 4.6 that compares the two groups. Independent t-test comes with two tables: the first one is group statistics and the second one is independent sample statistics. Levene's test is used to test if k samples have equal variances. Equal variances across samples are called homogeneity of variance. Same statistical tests, for example the analysis of variance, assume that variances are equal across groups or samples. The levene test used to verify that assumption.

Objective 06: To compare the sources of knowledge explicitness of Public and Private University teachers.

H_4: There is no difference between public and private university teachers when it comes to the use of knowledge explicitness sources.

Table 4.6

Results of Public and private university Teachers Comparison of Sources of Explicitness

	Group Statistics				**Levene's Test for Equality of Variances**		**T-Test**		
	Universities	**N**	**Mean**		**F**	**Sig.**	**T**	**Df**	**Sig. (2-tailed**
Sources of Explicitness (Cumulative)	Public	391	4.10	Equal Variances assumed	0.41	0.52	4.39	493	0.00
	Private	104	3.87	Equal Variances not assumed			4.34	159.29	0.00

The cumulative comparison of sources of knowledge explicitness between public universities with 391 respondents and private universities with 104 respondents was made. The mean of public universities was 4.098 and the mean of private universities was 3.874. It shows there is difference between public and private universities.

The cumulative comparison (public and private) of sources of explicitness included all statements about sources of explicitness which were cumulatively used to compare sample means as shown in the following lines:

The outcomes in the independent samples test table contained two rows:

a.   Equal variance assumed; and

b.   Equal variance not assumed

The F value of Levene's test was 0.413 with the Sig. (p) value was 0.521. As shown in table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that $t_{(493)} = 4.395$, $p < 0.000$ because the Sig. (p) value was lower than our alpha 0.05 shows that there was significant difference between the public and private universities use of sources of explicitness.

4.8 Faculty wise Comparison of Sources of Explicitness of University Teachers (Natural Sciences and Social Sciences)

The seventh objective is about the comparison between Faculty of Natural Sciences and Faculty of Social Sciences regarding the sources of explicitness.

Independent t-test has been applied in table 4.7 that compares the two groups. Independent t-test comes with two tables: the first one is group statistics and the second one is independent sample statistics. Levene's test is used to test if k samples have equal variances. Equal variances across samples are called homogeneity of variance. Same statistical tests, for example the analysis of variance, assume that variances are equal across groups or samples. The levene test used to verify that assumption.

Objective 07: To compare the sources of knowledge explicitness of Faculty of Natural Sciences and Faculty of Social Sciences.

H_5: There is no difference between the faculty of natural sciences and faculty of social sciences in their use of the sources of knowledge (knowledge explicitness).

Table 4.7

Results of Comparison of Sources of Explicitness between Faculty of Natural Sciences and Faculty of Social Sciences

	Group Statistics				Levene's Test for Equality of Variances		T-Test		
	Faculties	N	Mean		F	Sig.	T	Df	Sig. (2-tailed
Sources of Explicitness (Cumulative)	Natural Sciences	282	4.09	Equal Variances assumed	1.85	0.17	2.28	493	0.02
	Social Sciences	213	3.99	Equal Variances not assumed			2.27	415.90	0.02

The cumulative comparison was made on the sources of knowledge explicitness between Faculty of Natural Sciences and Faculty of Social Sciences with 282 respondents from the Faculty of Natural Sciences and 213 respondents from the Faculty of Social Sciences. The mean of Faculty of Social Sciences was 4.09 and the mean of Faculty of Social Sciences was 3.99. It shows there is difference between them.

The cumulative comparison (Faculty of Natural Sciences and Faculty of Social Sciences) of sources of explicitness included all statements about sources of explicitness which were cumulatively used to compare sample means as shown below:

The outcomes in the independent samples test table contained two rows:

   a.   Equal variance assumed; and

   b.   Equal variance not assumed

The F value of Levene's test was 1.85 with the Sig. (p) value was 0.17. As shown in table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that t $_{(493)}$ = 2.284, p < 0.02 because the Sig. (p) value was lower than our alpha 0.05 shows that there was significant difference between the public and private universities use of sources of explicitness.

4.9 Gender wise Comparison of Sources of Explicitness of University Teachers (Male and Female)

The eighth objective is about the comparison between male and female sources of explicitness.

Independent t-test has been applied in table 4.8 that compares the two groups. Independent t-test comes with two tables: the first one is group statistics and second one is independent sample statistics. Levene's test is used to test if k samples have equal variances. Equal variances across samples are called homogeneity of variance. Same statistical tests, for example the analysis of variance, assume that variances are equal across groups or samples. The levene test used to verify that assumption.

Objective 08: To compare the sources of knowledge explicitness of Male and Female university teachers.

H_6: There is no difference between male and female university teachers in their use of the sources of knowledge explicitness.

Table 4.8

Results of Male and Female University Teachers Comparison of Sources of Explicitness

	Group Statistics				Levene's Test for Equality of Variances		T-Test		
	Gender	N	Mean		F	Sig.	T	Df	Sig. (2-tailed
Sources of Explicitness (Cumulative)	Male	267	4.09	Equal Variances assumed	1.85	0.17	2.28	493	0.02
	Female	228	3.99	Equal Variances not assumed			2.27	415.90	0.02

The cumulative comparison was made regarding sources of knowledge explicitness used by male and female university teachers with 267 male respondents and 228 female respondents. The cumulative comparison of sources of explicitness depicts that the mean of male was 4.09 and the mean of female was 3.99. This shows there is difference between male and female

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faculty members but male teachers are better in the use of source of explicitness as compared to their female counterparts.

The cumulative comparison (male and female) of sources of explicitness included all statements about sources of explicitness which were cumulatively used to compare sample means as shown below:

The outcomes in the independent samples test table contained two rows:

a.   Equal variance assumed; and

b.   Equal variance not assumed

The F value of Levene's test was 1.851 with the Sig. (p) value was 0.174. As shown in table that Sig. (p) value of Levene's test was greater than our alpha 0.05 so we took "Equal Variances Assumed" for t-statistics. The t-statistics showed that t $_{(493)}$ = 2.279, p < 0.023 because the Sig. (p) value was lower than our alpha 0.05 shows that there was significant difference between the male and female use of sources of explicitness.

4.10 Summary

Descriptive statistics were applied on first two objectives and the results of the objectives are mentioned in table 4.9.

Table 4.9

Research Questions Summary

SR.NO		MEAN VALUES	RESPONSES
Research Question 01	Cumulative Mean Internalization	**4.287**	AGREED (Lowest one)
	Cumulative Mean Externalization	**4.408**	AGREED (Highest one)
	Cumulative Mean Socialization	**4.380**	AGREED
	Cumulative Mean Combination	**4.354**	AGREED
	KC CUMULATIVE VALUES	**4.337**	**AGREED**
Research Question 02	Articles, an educational course and seniors lectures	**4.15**	MUCH USED (Highest Value)
	Sources of knowledge (knowledge explicitness)	**4.099**	**MUCH USED**

For the first research question, 5-point Likert scale (Strongly disagree, disagree, neutral, agree, strongly agree) has been used to examine the attributes of respondents towards knowledge creation practices. The mean values show the agreed perception of respondents.

In the second research question, 5-point Likert scale (very little, little, sometimes, much, very much) has been used to examine the interest of respondents in the sources of explicitness. The mean value shows the much-used perception of respondents.

Table 4.10

Hypotheses Summary

SERIAL NO	HYPOTHESIS		RESULTS
Hypothesis 0 1	There is no difference between public and private university teachers knowledge creation practices (SECI)	Internalization	Null = rejected Alternative = Accepted
		Externalization	Null = Accepted Alternative = Rejected
		Socialization	Null = rejected Alternative = Accepted
		Combination	Null = Accepted Alternative = Rejected
		Knowledge creation	**Null = rejected Alternative = Accepted**
Hypothesis 0 2	There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences knowledge creation practices (SECI)	Internalization	Null = rejected Alternative = Accepted
		Externalization	Null = rejected Alternative = Accepted
		Socialization	Null = rejected Alternative = Accepted
		Combination	Null = rejected Alternative = Accepted
		Knowledge creation	**Null = rejected Alternative = Accepted**
Hypothesis 0 3	There is no difference between male and female university teachers knowledge creation practices (SECI)	Internalization	Null = Accepted Alternative = Rejected
		Externalization	Null = rejected Alternative = Accepted
		Socialization	Null = rejected Alternative = Accepted
		Combination	Null = Accepted Alternative = Rejected
		Knowledge creation	**Null = rejected Alternative = Accepted**

SERIAL NO	HYPOTHESIS	RESULTS
Hypothesis 0 4	There is no difference between public and private university teachers using of sources of knowledge (knowledge explicitness).	**Null = rejected** **Alternative = Accepted**
Hypothesis 0 5	There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences use of sources of knowledge (knowledge explicitness).	**Null = rejected** **Alternative = Accepted**
Hypothesis 0 6	There is no difference between male and female university teachers using of sources of knowledge (knowledge explicitness	**Null = rejected** **Alternative = Accepted**

If the p-value is less than (or equal to) our alpha, then null hypothesis is rejected in favor of the alternative hypothesis. In addition, if the p-value is greater than the null hypothesis then null hypothesis is not rejected

CHAPTER 5

SUMMARY, FINDINGS, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Learning and knowledge are important parts of our lives. Learning is a general term while knowledge has specific qualities. We keep learning every moment but knowledge is a process of implementing what we learn.

Knowledge has complicated nature. Every organization has its own knowledge assets. There are two types of knowledge used for organizational learning: explicit and tacit.

1. Explicit knowledge is in the form of documentation (books, audios, videos etc) which is accessible and manageable with little effort.

2. Tacit knowledge is the opposite of explicit knowledge. It is neither easily accessible nor manageable because it is related to a person's skills, insights, and experiences.

The conversion of the latest knowledge into existing knowledge assets of an organization is called creation of knowledge. It is based upon research and development (R & D) through explicit and tacit knowledge.

According to Nonaka knowledge creation is the "continuous transfer, combination, and conversion of different types of knowledge, as users practice, interact, and learn." Knowledge creation is the combination of these aspects as given by Nonaka, Takeuchi & Umemoto (1996).

The study is related to knowledge as hinted above. The Nonaka & Takeuch's (1995) knowledge spiral theory serves as the basis of the study. The four chained modes namely socialization, externalization, combination and internalization (SECI model) have also been considered during the study.

The purpose of this study is to take far down information about knowledge creation practices and its sources used in universities. The objectives of the study as defined earlier include, (1) to explore the status of knowledge creation practices (Socialization, Externalization, Combination and Internalization, (SECI)) of university teachers (2) to explore the sources of explicitness of university teachers (3) to compare the knowledge creation practices (SECI) of Public and Private

University teachers (4) to compare the knowledge creation practices (SECI) of Faculty of Natural Sciences and Social Sciences (5) to compare the knowledge creation practices (SECI) of male and female university teachers (6) to compare the sources of explicitness of public and private university teachers (7) to compare the sources of explicitness of the Faculty of Natural Sciences and Social Sciences (8) and to compare the sources of explicitness of male and female university teachers.

The research design applied in this study is cross-sectional and based on quantitative research approach. Descriptive survey research method has been used for the study. The study was conducted in public and private universities of Rawalpindi and Islamabad. The teaching faculty of the departments of Social Sciences and Natural Sciences was the population of the study.

The total teaching faculty members of universities of the twin cities (Rawalpindi and Islamabad) were 7625 out of which 5892 were part of public sector universities while 1733 were employed in private universities. For pilot testing, 2 universities were selected (one each from public and private sectors) and 2 universities were not related because of the absence of relevant departments. After excluding 4 universities, 25 universities (18 public, 7 private) were left. From which 11 universities were selected; 7 were public and 3 were private universities.

The total number of the teaching Faculty of Natural Sciences and Social Sciences departments of the selected universities was 4289. After selection of two universities for pilot testing, the remaining population was 4195 from which 3202 were working in public universities while 993 were engaged in private sector universities. The number of total universities selected from the twin cities of Rawalpindi and Islamabad was 29 out of which 20 were from public sector and 9 from private sector. The sample size from targeted population (N=4195) was estimated 503 or 12%. From the total sample size, 17.7% respondents were taken from each sampling unit. As Stratified proportionate sampling technique was used in the study, the sample size comprised six startas i.e. public and private university teachers, Faculty of Natural Sciences and Social Sciences and male and female. To collect data, a standardized questionnaire was used. It contained close-ended questions with 5-point Likert scale. First The section was demographic section. Section-02 and section-03 which were about knowledge creation practices. and sources

of knowledge explicitness were developed by Huang & Wang, 2002 and Gerard, 2003 respectively.

For pilot testing, two universities were selected: one was private i.e National University of Computer and Emerging Sciences and the second was public university i.e PMAS-Arid Agriculture University Rawalpindi. A total of 20 respondents (22% of population) were chosen for pilot testing. The coefficient of reliability in reliability testing of questionnaire was acceptable. The questionnaire was validated from experts. After data collection, descriptive statistic (mean values) and independent t-test (F-stat for levene's test, z-test) were used for data analysis.

5.2 Findings

The findings of the study are as follow:

1. "Internalization (explicit knowledge to tacit knowledge)": The cumulative mean value of internalization is 4.287. (Table 4.1)

2. "Externalization (tacit knowledge to explicit knowledge)": The cumulative mean value of externalization is 4.408. (Table 4.1)

3. "Socialization (tacit knowledge to tacit knowledge)": The cumulative mean value of socialization is 4.380. (Table 4.1)

4. "Combination (explicit knowledge to explicit knowledge)": The cumulative mean value of combination is 4.354. (Table 4.1)

Knowledge creation (KC) is the cumulative value obtained with the collection of four sections (internalization, externalization, socialization, and combination). The knowledge creation (KC) cumulative mean value is 4.337. (Table 4.1)

5. The mean value of the "article", "an educational course", and the "seniors lectures" is 4.15. (Table 4.2)

6. The mean value of" listening to presentations" and the "individual study" is 4.13. (Table 4.2)

7. The mean value of the "degree in education", "team/group", "course projects", and "visual information" is 4.10. (Table 4.2)

8. The mean value of "working with other people" is 4.09. (Table 4.2)

9. The mean value of "listening to other leaders" is 4.08. (Table 4.2)

10. The mean value of "newspaper or news", "education-related games", "the statement made by authorities", "comparison of multiple educational institutions", and "lengthy educational conversations" is 4.07. (Table 4.2)

11. The mean value of "journals", "reports", "thinking about education" and "other insights about education" is 4.06. (Table 4.2)

12. The mean value of "education-related shows", and "popular educational magazine" is 4.05. (Table 4.2)

13. The mean value of "emails" is 4.03. (Table 4.2)

14. The mean value of "course textbooks", "case studies" and, "education internship" is 4.01. (Table 4.2)

15. The mean value of "listening to educational experts", "other personal life experiences" and, "personal insight" is 4.00. (Table 4.2)

16. The mean value of "personal experience" and "body language" is 3.99. (Table 4.2)

17. The mean value of "popular educational books" and "student discussion" is 3.98. (Table 4.2)

18. The mean value of "in-class discussions about current events" is 3.97. (Table 4.2)

19. The mean value of "stories" is 3.96. (Table 4.2)

20. The mean value of "giving presentations" is 3.95. (Table 4.2)

21. The mean value of "interviews of people in the education-related situation" is 3.93. (Table 4.2)

As per analysis, the sources of knowledge explicitness disclose that the cumulative mean value of sources of explicitness is 4.099. (Table 4.2)

22. Internalization: The comparison between public and private universities shows that the mean value of public sector university respondents is 4.34 and the mean value of private sector university respondents is 4.23. T-statistics shows that t $_{(493)}$ = 2.92, p < 0.00, the sig

(p) value is greater than alpha 0.05; therefore, there is a significant difference between teachers of public university and private university in terms of knowledge creation practice (internalization). (Table 4.3)

23. Externalization: The comparison between public and private universities shows that the mean value of public university respondents was 4.47 and the mean value of private university respondents is 4.44. T-statistics shows that t $_{(125.26)}$ = 0.91, p > 0.36, the sig (p) value was greater than alpha 0.05. So there is no significant difference between teachers of public university and private university in terms of knowledge creation practice (externalization). (Table 4.3)

24. Socialization: The comparison between public and private universities shows that the mean value of public university respondents is 4.48 and the mean value of private university respondents is 4.39. T-statistics shows that t $_{(129.54)}$ = 0.91, p < 0.01, the sig (p) value is smaller than alpha 0.05. Hence there is significant difference between teachers of public university and private university in terms of knowledge creation practice (socialization). (Table 4.3)

25. Combination: The comparison between public and private universities shows that the mean value of public university respondents is 4.47 and the mean value of private university respondents is 4.43. T-statistics shows that t $_{(133.21)}$ = 1.14, p > 0.26, the sig (p) value is greater than alpha 0.05. Thus there is no significant difference between teachers of public university and private university in terms of knowledge creation practice (combination). (Table 4.3)

The comparison between respondents of public and private universities about knowledge creation (SECI) shows that the mean value of public university respondents is 4.45 and the mean value of private university respondents is 4.383. T-statistics shows that t $_{(120.33)}$ = 2.41, p < 0.01, the sig (p) value is smaller than alpha 0.05. Therefore, there is significant difference between teachers of public university and private university in the area of knowledge creation practice (SECI) cumulatively. (Table 4.3)

26. Internalization: The comparison between Faculty of Natural Sciences and Faculty of Social Sciences shows that the mean value of Faculty of Natural Sciences is 4.34 and the mean value of Faculty of Social Sciences is 4.16. T-statistics shows that t $_{(399.29)}$ = 7.67, p

< 0.00, the sig (p) value is lower than alpha 0.05; therefore, there is significant difference between teachers of Faculty of Natural Sciences and Faculty of Social Sciences teachers in terms of knowledge creation practice (internalization). (Table 4.4)

27. Externalization: The comparison between Faculty of Natural Sciences and Faculty of Social Sciences shows that the mean value of Faculty of Natural Sciences is 4.51 and the mean value of Faculty of Social Sciences is 4.44. T-statistics shows that t $_{(493)}$ = 5.61, p < 0.000, the sig (p) value is lower than alpha 0.05; therefore, there is significant difference between teachers of Faculty of Natural Sciences and Faculty of Social Sciences about knowledge creation practice (externalization). (Table 4.4)

28. Socialization: The comparison between Faculty of Natural Sciences and Faculty of Social Sciences shows that the mean value of Faculty of Natural Sciences is 4.51 and the mean value of Faculty of Social Sciences is 4.35. T-statistics shows that t $_{(448.18)}$ = 11.77, p < 0.000, the sig (p) value is lower than alpha 0.05; hence, there is significant difference between teachers of Faculty of Natural Sciences and Faculty of Social Sciences in terms of knowledge creation practice (socialization). (Table 4.4)

29. Combination: The comparison between Faculty of Natural Sciences and Faculty of Social Sciences shows that the mean value of Faculty of Natural Sciences is 4.55 and the mean value of Faculty of Social Sciences is 4.35. T-statistics shows that t $_{(470.39)}$ = 9.24, p < 0.000, the sig (p) value is lower than alpha 0.05; Therefore, there is significant difference between teachers of Faculty of Natural Sciences and Faculty of Social Sciences teachers about knowledge creation practice (combination). (Table 4.4)

The comparison between Faculty of Natural Sciences and Faculty of Social Sciences about knowledge creation (SECI) shows that the mean value of Faculty of Natural Sciences is 4.48 and the mean value of Faculty of Social Sciences is 4.34. T-statistics shows that t $_{(491.97)}$ = 13.98, p < 0.00, the sig (p) value is smaller than alpha 0.05. Therefore, there is significant difference between Faculty of Natural Sciences and Faculty of Social Sciences in the area of knowledge creation practice (SECI) cumulatively. (Table 4.4)

30. Internalization: The comparison between male and female respondents shows that the mean value of male teachers is 4.33 and the mean value of female teachers is 4.35. T-statistics shows that t $_{(493)}$ = -0.63, p > 0.53, the sig (p) value is greater than alpha 0.05.

Therefore, there is no significant difference between male and female teachers about knowledge creation practice (internalization). (Table 4.5)

31. Externalization: The comparison between male and female respondents shows that the mean value of male teachers is 4.46 and the mean value of female teachers is 4.53. T-statistics shows that t $_{(493)}$ = -3.09, p < 0.00, the sig (p) value is smaller than alpha 0.05; hence there is significant difference between male and female teachers in the area of knowledge creation practice (externalization). (Table 4.5)

32. Socialization: The comparison between male and female respondents shows that the mean value of male teachers is 4.46 and the mean value of female teachers is 4.53. T-statistics shows that t $_{(493)}$ = -2.32, p < 0.02, the sig (p) value is smaller than alpha 0.05. Thus there is significant difference between male and female teachers in terms of knowledge creation practice (socialization). (Table 4.5)

33. Combination: The comparison between male and female respondents shows that the mean value of male teachers is 4.46 and the mean value of female teachers is 4.50. T-statistics shows that t $_{(475.00)}$ = -2.49, p > 0.15, the sig (p) value is greater than alpha 0.05; therefore, there is no significant difference between male and female teachers about knowledge creation practice (combination). (Table 4.5)

The comparison between male and female respondents about knowledge creation (SECI) shows that the mean value of male teachers is 4.43 and the mean value of female teachers is 4.49. T-statistics shows that t $_{(493)}$ = -2.62, p < 0.01, the sig (p) value is smaller than alpha 0.05. So there is significant difference between male and female teachers about knowledge creation practice (SECI) cumulatively. (Table 4.5)

34. The comparison between public and private university respondents about sources of knowledge explicitness shows that the mean value of public university teachers is 4.10 and the mean value of private university teachers is 3.87. T-statistics shows that t $_{(493)}$ = 4.39, p < 0.00, the sig (p) value is smaller than alpha 0.05; therefore, there is significant difference between public and private universities about the use of sources of knowledge explicitness. (Table 4.6)

35. The comparison between Faculty of Natural Sciences and Faculty of Social Sciences about sources of knowledge explicitness shows that the mean value of Faculty of Natural Sciences is 4.09 and the mean value of Faculty of Social Sciences is 3.99. T-statistics shows that t $_{(493)}$ = 2.28, p < 0.02, the sig (p) value is smaller than alpha 0.05. Therefore, there is significant difference between Faculty of Natural Sciences and Faculty of Social Sciences in their use of sources of knowledge explicitness. (Table 4.7)

36. The comparison between male and female respondents about sources of knowledge (knowledge explicitness) shows that the mean value of male respondents is 4.09 and the mean value of female respondents is 3.99. T-statistics shows that t $_{(493)}$ = 2.279, p < 0.023, the sig (p) value is smaller than alpha 0.05. Therefore, there is significant difference between male and female teachers in their use of sources of knowledge (knowledge explicitness). (Table 4.8)

5.3 Discussion

The character of teachers in the modern era is difficult to embrace. Previously, the character of teachers as knowledgeable personalities with a collection of prepared and quick settlement was hard to deny. It is challenging to introduce oneself courageously into the discussion with listening, questioning, and speaking equally as a leader to facilitate.

Working groups think that the spare time for interaction is too limited.

It is concluded that university teachers use all knowledge creation practices. The rank of knowledge creation practices from most to least is externalization, socialization, combination, and internalization. The most exercised knowledge creation practice is externalization. Externalization is to change the solid abstract ideas into some written form by using symbols, text, manifestation, analogy, and experimentation.

Glisby and Holden (1003), Weir and Hutchings (2005), Haag et al. (2010), and Andreeva and Ikhilchik (2011) supports these findings and suggest that universality of knowledge creation (SECI model) is not global and the modes of knowledge creation (SECI model) have not equal worth in different culture and sectors but the knowledge creation practices used in higher education institutions. In Pakistan, all sector moving up to the collective rather than individuals level of knowledge creation practice, but the most used practice of knowledge creation is

externalization (Saeed, Tayyab, Anis-Ul-Haque, Ahmad & Chaudhry, 2010; Kanu, 2005; Alam, Ali, & Subhan, 2015), the findings of this study with consistent with the by the excess to explore. Therefore, the findings of this study agree with (Nonaka and Takeuchi, 1995) who believe the externalization process as the primary means of knowledge creation and another researcher (Kao et al. 2011) who believe that the occurrence of progressive knowledge creation reply on process of organizational combination and internalization because the knowledge which collect explicitly helpful to generate new knowledge. It is not necessary as nonaka and takeuchi (1995) mentioned in their model that the SECI process start with socialization whereas it can also start from internalization or combination. Various components of the knowledge creation SECI model overlie and can be attached to multiple processes and used in organizational knowledge creation (Easa, 2012) the study was conducted in Egypt. Training session can be studies as the process of improving face-to-face discussions and externalization knowledge give assistance to the discussion by documenting them, or internalization knowledge delivers learning method and material with outcomes of these sessions (Easa, 2012) and the study support the finding of the study. However, the leaderships and teachers indicates that the SECI model helpful tool that has to use in organization for knowledge management activities that support the findings of Nonaka et al. (2000) and Von Krogh et al. (2012).

Public university teachers are more engaged in knowledge creation practices as compared to private university teachers. Public university teachers are better in internalization and socialization practices than externalization and combination.

Naidu & Derani, 2016 made a comparison of the quality of education provided by public and private universities. The results of their study show that the public sector universities were better in research reputation, international presence, technologically equipped with good management, and also ran government accredited programs in Malaysia. The current study is consistent with the findings of Naidu and Derani. Another study in the similar area was conducted by by Arif & Hasan, 2013; Iqbal, Arif, & Abbas, (2011), and they found that there was significant difference between public and private universities as the former were better in the areas of job definition, compensation, team work, and employee's participation. Their study is supported by the current study. On the research ground, public universities were better as compared with private universities in Malaysia. The study done by Lam, 2009 on the public and private universities of Vietnam explored that the institutions of public and private universities

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faced same issues in recruiting and developing their academic staff, but the public sector universities have the advantage of government funding ; therefore, they are better than private universities. In a research study about Turkish public and private universities, Bayraktar, Tatoglu & Zaim, 2013 explored that the public universities were more successful in managing quality management practices for teaching and research performance. The findings of all these studies are in consonance with the findings of the current study.

The Faculty of Natural Sciences was more engaged in knowledge creation practices as compared to the Faculty of Social Sciences.

In order to understand these clear field differences, we have to consider variations in knowledge structures and research organizations. Research traditions in the field of humanities and to some extent in Social Sciences are usually individually oriented. On the contrary, in the fields of natural and medical sciences and technology much research work is done in collaboration. . To get access to resources and expensive technical equipment, scientists often have to collaborate. Whitley, 1984and Becher, 1989 supported the findings of the current research study. In other words, scientists in "hard" sciences are more dependent on each other than researchers in "soft" sciences. In addition, in the latter fields, independence is often regarded as fruitful in order to develop new scientific paradigms. Heberlein, 1988 discussed in his research study titled, "Improving Interdisciplinary Research: Integrating the Social and Natural Sciences" the relationship between Social Sciences and Natural Sciences along with five barriers that include the weakness of Social Sciences, a perceived illegitimacy of Social Sciences, the punishment associated with interdisciplinary support structures and conflicts over power and control. In support of their findings, the research study of Larivière, Archambault, Gingras, & Vignola-Gagné, (2006) proved that natural and Social Sciences are almost the same in research and innovation practices but the role of humanities is stagnant. Another study shows that the collaboration of Social Sciences and humanities is different: the collaboration practices of Social Sciences and Natural Sciences are almost the same with little difference (Larivière, Gingras & Archambault, 2005). Cohen, 2013 investigated in his research work on Natural Sciences and the Social Sciences. according to some critical and historical perspectives, people related to Social Sciences have limited knowledge of Natural Sciences and vice versa. The investigation of Cohen, 2013 supports the findings of this study. Science has reciprocal relations with all the other components of society; therefore, the collaboration of Natural Sciences and Social Sciences

increases knowledge and innovation in both disciplines. Barthel & Seidl, 2017 said that previous studies often based on Bibliometric analysis of large bodies of literature partly observed an increase in interdisciplinary collaboration in general, but in particular, the collaboration and differences among different fields was less explored. Other qualitative studies found that interdisciplinary collaboration and differences, particularly between natural and Social Sciences were not well developed, and obstacles abounded.

Female university teachers are more dedicated to knowledge creation practices than male university teachers. Female university teachers exercised more socialization and externalization practices than combination and internalization.

Female university teachers are good in knowledge creation practices than male. Durbin, 2011 said in his research about Creating Knowledge through Networks: A Gender Perspective that a female senior manager is a potential knowledge creator than her male counterpart. Razi, Karim & Mohamed, 2014 said the use and support of ICT for searching and sharing information is more common in female managers than male managers (Hu et al., 2010) Female employees have willingness to comply with the manifesto of the organization than male employees. The above studies also support the findings of the current research study. The difference can be attributed to gender differences- a fundamental socio-cultural factor which influences people's perception and behavior significantly (Gefen & Straub, 1997). According to Hu et al., 2010, gender plays an important role in determining a person's frame of reference in evaluating a technology; e.g., usefulness or ease of use. However some empirical evidence suggests that the perceived usefulness of knowledge is more salient in male as compared to female (Venkastesh & Morris, 2000). Kaba & Ramaiah, 2017 said that there is no significant difference in using knowledge creation tools with respect to gender, qualification, academic rank, teaching experience and institutional affiliation. The findings of another research study show that male faculty members have higher knowledge management than female faculty members Gilavand & Mohammad Bidaghi, 2019 show inconsistency with the findings of the current research study.

University teachers used all sources of explicitness but articles, an educational course and seniors lectures were the most useful sources of knowledge explicitness.

Writing, reading and reviewing of articles are used increase knowledge explicitness. Articles are useful for sources of explicitness, the finding are consistent with the study of

Willingham, 2006; Cvitanovic et al., 2015. Educational courses increase the awareness and knowledge in individuals Garavan & Barra(1994) study is consistent with the findings. On the other side Stark et al., 2011 study was also consistent with the findings, they said that the online educational course increase the knowledge skills and self-efficacy. Taking note and lectures from senior teacher increase the proficiency in teacher (Haung, 2012) and the study is consistent with the findings of dissertation. The findings are also consistent with the study of Hold, 2017.

The findings assist the theory of Nonaka and associates (Nonaka, 1991, 1994; Nonaka & takeuchi, 1995). The whole study was based on the knowledge creation theory (SECI model). SECI model based upon four knowledge conversion modes chained into two aspects. The names of four modes are internalization, externalization, combination and socialization.

1. **Socialization (tacit → tacit)**

Socialization is a process of conversion knowledge from tacit to tacit knowledge. By sharing the experience with colleagues and students without writing it down. However, this type of knowledge has limits when it comes to creating knowledge because the knowledge holder may not be transferring his knowledge into explicit form. Teachers and learners both have a less scientific understanding of knowledge (experience and skills) without explicit knowledge.

University teachers through sharing (experiences, thoughts, ideas, and opinions with each other) during a discussion, teamwork, and projects obtain the transfer of tacit knowledge from one person to another. O'Dell (1996) describes that sharing of knowledge is the most powerful means to increase personal insights as well as experiences of teachers. Knowledge sharing encourages and increases confidence in teachers who start their career afresh. The transferring of knowledge through sharing would be an effective approach if teachers are willing to share and utilize it in teaching and other activities (Amin, 2005). For the creation and sharing of knowledge, face-to-face discussion between staff is necessary (Nonaka and Takeuchi, 1995). Rismark, M., & Sølvberg, A. M. 2011 said the participation of teachers in knowledge sharing activities (discussion (formal and informal), teamwork, and joint projects) actually involves teachers in knowledge sharing activities that expand their own wisdom. According to Engerstorm (2011), the discussion involves the formation of concepts, thoughts, or ideas. Some other researchers such as (Webb & Blond, 1995; Mercer, 1995; Hiebert, Gallimore & Stigler, 2002; Carroll, Choo, Dunlap, Isenhour, Kerr, MacLean & Rosson, 2003; Berry, 2007) also

agreed to the point that socialization has a positive impact on knowledge creation. Teachers share their experiences, ideas, concepts and opinions with each other. Some teachers like Deans, Heads of departments have authority to manage and hold things well In short socialization improves the knowledge creation activities as supported by Weir and Hutachings, 2005 that socialization is a natural process in the workplace.

2. Externalization (tacit → explicit)

Externalization is a process of knowledge creation that is based on conversion of tacit to explicit knowledge. This type of knowledge is shared by using image and conceptual theories.

Externalization needs internal bound to support examples, such as giving others a complete understanding of something the examples and analogies help to describe tacit knowledge. Abstraction needs verbalization with the support of examples to provide others with complete understanding (Newman, Griffin, & Cole, 1989). The influence of outcomes of externalization is not an unknown function of knowledge creation (e.g., Chambers & Reisberg, 1985; Kirsh, 1995; Schwartz, 1995; Zhang, 1997). The externalization relates to the "trialogical" learning approach based on three foundations of learning metaphor called personal learning, teamwork, and collaborative knowledge creation (Paavola, Lipponen & Hakkarainen, 2004). Teachers in the new era are more expressive and have more tools and devices (multimedia) to interact with the world and gain knowledge. In support of findings, some other researchers contribute to this study (Nonaka & Toyama, 2015; Gourlay, 2006; Shirouzu, Miyake & Masukawa. 2002; Huang & Wang, 2002; Dawson, 2014).

3. Combination (Explicit → Explicit)

Combination is a process-based conversion of explicit to explicit knowledge. The process is complicated and scientific as individuals combine and exchange different explicit knowledge with others. The current knowledge is combined and exchanged by integrating new knowledge in the knowledge account.

The clearer, obvious, and more favorable form of explicit knowledge it is reworded. By means of combination, the pior-disconnected knowledge is connected with the existing one. (Buckley & Carter 1994). Knowledge combination is a kind of meta-data which refers to "description and information given about other data" (Marwick, 2001). Various researchers have

indicated that the combination of existing knowledge is an essential practice for knowledge creation (Schumpeter, 1934; Kogut & Zander, 1992; Tsai, 2001; Nerkar, 2003). Recombination of knowledge is known as innovation (Schumpeter, 1934; Nelson & Winter, 1977; Dosi, 1982) The summary of any event is a kind of explicit knowledge that is recombined to avoid complexity (Tombros, Sanderson and Gray, 1998) with a more structured form (Marwick, 2001). The efficiency of a teacher increases knowledge combination activities like interaction and collaboration with new thoughts, structured concepts, and summaries in an accurate and professional manner (Hargreaves, 1999; Bae, Song & Kim, 2012; Hegarty, 2000; Lin, Lin, & Huang, 2008). In support of knowledge combination and positive influence of knowledge creation, some other research studies have been added (Schulze & Hoegl, 2006; Tolstoy, 2009; Li, Huang & Tsai, 2009; Shu, Page, Gao & Jiang, 2012; Menguc, Auh & Uslu, 2013).

4. Internalization (Explicit → tacit)

Internalization is a knowledge creation process based on conversion of explicit to tacit knowledge. "The process socializes, externalizes, and combines the explicit languages, texts, pictures, or information, and then internalizes them into personal knowledge." In short, the system in which employees learn from others' new and explicit knowledge, their tacit knowledge is enhanced, increased, and refined.

The internalization knowledge is a kind of "learning by doing" so learning practice is necessary (Nonaka &Takeuchi, 1995). Experience is based on tacit knowledge. People learn from personal experiences and the physical world around (Nonaka, Byosiere, Borucki, & Konno, 1994; Cong & Pandya, 2003). "The internalization and reflection go together with an understanding that reflection comprises a steadily but progressive transformation of genuinely discrete external social knowledge into embedded and personal knowledge (Kolb, 1984)". Teachers facilitate the internalization process of learning through experiences which they share with others (Hou, Sung & Chang, 2009). In support of knowledge, internalization promotes knowledge creation various research studies have been included (Nonaka & Konno, 1998; Nonaka & Toyama, 2015; Popadiuk & Choo, 2006; Shang, Li, Wu & Hou, 2011; Akbar, 2003).

5.4 Conclusion

The following conclusion is drawn from the findings of the study:

The university teachers use all knowledge creation practices. The rank of knowledge creation practices from most to least is externalization, socialization, combination, and internalization. The most exercised knowledge creation practice is externalization. Externalization is to change the solid abstract ideas into a written form using symbols, text, manifest analogy and experimentation.

All sources of explicitness are used by university teachers but articles, an educational course, and seniors lectures are the most useful sources of knowledge explicitness.

Public university teachers are more engaged in knowledge creation practices as compared to private university teachers. Public university teachers are better in internalization and socialization practices than externalization and combination.

The Faculty of Natural Sciences is more engaged in knowledge creation practices as compared to the Faculty of Social Sciences.

Female university teachers are more dedicated to knowledge creation practices than male university teachers were. Female university teachers exercise more socialization and externalization practices than combination and internalization.

Sources of knowledge explicitness are widely utilized by public university teachers as compared to private university teachers.

The Faculty of Natural Sciences more frequently uses the sources of knowledge explicitness as compared to the Faculty of Social Sciences.

Female university teachers actively use sources knowledge explicitness as compared to male university teachers.

Table 5.1

Alignment table (Objectives, Hypotheses, Statistical Techniques and Conclusion)

	Objectives	Research Questions/ Hypotheses	Statistical Techniques	Findings/Conclusion
1.	To explore the status of knowledge creation practices (Socialization, Externalization, Combination and Internalization, (SECI)) of university teachers.	To what extent do the university teachers utilize the knowledge creation practices?	Descriptive statistics (Mean)	It is concluded that university teachers use all knowledge creation practices. The rank of knowledge creation practices from most to least is externalization, socialization, combination, and internalization. The most exercised knowledge creation

#	Objective	Hypothesis / Question	Test	Findings
				practice is externalization.
2.	To explore the source of explicitness of university teachers.	What sources of knowledge explicitness did university teachers more frequently use?	Descriptive statistics (Mean)	All sources of explicitness are used by university teachers but articles, an educational course, and senior lectures are the most used sources of knowledge explicitness.
3.	To compare the knowledge creation practices (SECI) of Public and Private University teachers	$H0_1$: There is no difference between public and private university teachers' knowledge creation practices	Independent t-test: Means, F-stat for Levene's test, z test	Public university teachers are more engaged in knowledge creation practices as compared to private university teachers. Public university teachers are better in internalization and socialization practices than externalization and combination.
4.	To compare the knowledge creation practices (SECI) of Faculty of Natural Sciences and Faculty of Social Sciences	$H0_2$: There is no difference between Faculty of Natural Sciences and Faculty of Social Sciences knowledge creation practices	Independent t-test: Means, F-stat for Levene's test, z test	The Faculty of Natural Sciences is more engaged in knowledge creation practices as compared to the Faculty of Social Sciences.
5.	To compare knowledge creation practices of Male and Female university teachers.	$H0_3$: There is no difference between male and female university teachers' knowledge creation practices	Independent t-test: Means, F-stat for Levene's test, z test	Female university teachers are more dedicated to knowledge creation practices than male university teachers. Female university teachers exercise more socialization and externalization practices than combination and internalization.
6.	To compare the knowledge creation practices (SECI) of Male and Female University teachers.	$H0_4$: There is no difference between public and private university teachers using of sources of knowledge explicitness.	Independent t-test: Means, F-stat for Levene's test, z test	Sources of knowledge explicitness is widely utilized by public university teachers as compared to private university teachers
7.	To compare the sources of knowledge explicitness of Faculty of Natural Sciences and Faculty of Social Sciences.	$H0_5$: There is no difference between the Faculty of Natural Sciences and Faculty of Social Sciences using of sources of knowledge (knowledge explicitness).	Independent t-test: Means, F-stat for Levene's test, z test	The Faculty of Natural Sciences more frequently uses the sources of knowledge explicitness as compared to the Faculty of Social Sciences.
8.	To compare the sources of knowledge explicitness of Male and Female university Teachers.	$H0_6$: There is no difference between male and female university teachers using of sources of knowledge explicitness.	Independent t-test: Means, F-stat for Levene's test, z test	Female university teachers actively use the sources of knowledge explicitness as compared to male university teachers.

The research has provided a knowledge-based view and empirically strengthens the role played by knowledge creation in enhancing innovation in Pakistani HEIs. These results give us a better understanding of how knowledge can lead to a competitive advantage in HEIs. Managing and creating knowledge as a strategic resource is one of the fundamental weapons that enable universities to increase their competitive advantage in the current competitive market and introduce structural changes that make the product and process of innovation part of the daily task for all staff in HEIs. Further, knowledge processes in education industry context were not studied before. This study is based on Nonaka's Spiral theory of Knowledge Creation (1995) that gives an insight into how knowledge is created and what is the most needed practice for teachers.

Form a methodological perspective, this research study supports and archives validity and reliability for the constructs that measure knowledge creation in a new geographical area.

5.6 Recommendations

From the results and findings of the research study, the following is recommended.

1. The analyses show that university teachers are less focused on internalization (learning by doing) knowledge creation practice. Scout method, experiential approach and the training approach (on site and remote workshop (group discussion), e-learning (self-study), learning by doing (exercises)) may be helpful to improve internalization practices in organizations.

2. The classic (teacher's magazines, dissemination seminars, websites), innovative (teacher research grant programs, best practice research scholarships, and networked learning communities) and re-schooling approaches can increase knowledge creation practices in teachers.

3. Higher Education Commission makes it possible to discuss about ideas, research studies and innovations in both formal and informal settings with their colleagues and staff, and they can consequently apply them in their respective organizations. They can also arrange trainings and seminars by hiring trainers. All these initiatives will improve knowledge creation.

4. Deans, and HoDs may also support teachers if they struggle in learning and understanding new data and processes.

5. Teachers may try to utilize the finding of research studies, ideas, and innovations in their daily activities.

6. Higher Education Commission may appreciate ideas for building up the culture of sharing in organizations. Teachers may take the risk of trying new ideas and improving themselves with the support of their organization.

7. Teachers may frequently use the sources of knowledge explicitness, especially combination, for strong knowledge creation practices.

8. Deans and HoDs may appreciate team learning within and between different departments in an organization (public and private universities) for a collaborative and positive environment.

9. Knowledge combination is a core process that facilitates knowledge creation in a learning organization. Knowledge combination practices in university teachers are less common in use, and in order to enhance knowledge combination practice, teachers may need continuous practice to renew knowledge with different combination methods such as meta-learning, and data mining with systematic practice to handle meta-data.

10. Higher Education Commission may set up strategies or channels to encourage knowledge sharing through reward and recognition systems to boost faculty members for their active participation in communication and exchanging of knowledge through publication and research projects.

5.6.1 Recommendations for future studies

1. Qualitative research or mixed method research may be carried out for in-depth exploration of knowledge creation concepts and experiences in more detail by collecting data from surveys (open-ended questions), interview sessions, discussion with focus groups and case studies.

2. Impact studies may be useful by adding other variable/s to show the nature of the relationship between two variables and it may also be helpful in decision making.

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Appendix I
Questionnaire

Background Information

These questions are about you, your education, and the time you have spent in teaching. In responding to the questions, please mark the appropriate box.

- **Gender**: ☐ ₁ Male   ☐ ₂ Female
- **Faculty** :   ☐Natural Sciences   ☐ ₂ Social Sciences
- **University**   ☐₁ Public   ☐ ₂ Private

Knowledge Creation Practices (developed by JIA–CHI HUANG)

To what extent do you agree with the following statements?

1= Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

INTERNALIZATION (explicit to tacit)	1	2	3	4	5
After hearing a new idea or concept, I tend to compare it with my experience to help me comprehend the meaning.					
I understand others thoughts better by repeating what they said and asking them "Is this what you mean?"					
I will tell others what I think to make sure my understanding is the same as theirs					
When I have finished saying something, I will ask the other person if it is necessary to repeat to make sure he/she understands exactly what I mean.					
When communicating with others, I will give others to think about what we just discussed.					
EXTERNALIZATION (tacit to explicit)	1	2	3	4	5
When others can't understand me, I am usually able to give him/her examples to help explaining.					
Most of the time, I can transcribe some of the unorganized thoughts into concrete ideas.					
I can describe professional or technical terms with conversational language to help communication in a team.					
I tend to use analogy when expressing abstract concepts.					
When I try to express abstract concepts, I tend to explain with examples					
I will help others to clearly expressing what he/she has in mind by encouraging					

them to continue what they are saying.					
When others cannot express themselves clearly, I usually help them clarify their points.					

SOCIALIZATION (tacit to tacit)	1	2	3	4	5
In team discussion, I will actively share my experience with others.					
In my work team, my teammates and I will share life or work experience with each other.					
During group discussion, I try to find out others opinions, thoughts and other information.					
During discussion, I will bring out some concepts, thoughts or ideas					
I often encourage others to express their thoughts.					
Before team discussion, I will collect necessary information and show it to my teammates.					
I like to get to know the people whom I will work with before going into a project together.					

COMBINATION (explicit to explicit)	1	2	3	4	5
During the discussion, I tend to help organize ideas and make conclusion to facilitate the discussion.					
When coming across problems, I tend to use my experience to help solving problems.					
After every event, I have the habit of organizing and making summary of what happened.					
During discussion, I will organize everyone's thoughts in my mind,					
I like to collect new information, and making connection of new and old knowledge to work up new concepts					
I like to organize ambiguous concept into structure					

Knowledge Source…Explicit and Tacit (developed by JOSEPH G. GERARD)

Please circle the number that best indicates the extent to which the listed source of knowledge has an explicit component.

1=Very Little, 2=Little, 3=Some, 4= Much, 5=Very much

KNOWLEDGE EXPLICTNESS	1	2	3	4	5
Newspapers or news					

Journal					
Articles					
Stories					
Popular educational magazine					
Course textbooks					
An educational course					
Case studies					
Education related videos					
Interviews of people in education-related situation					
Team/group exercises					
Giving presentations.					
Listening to presentations					
In-class discussion about current events					
Senior lectures					
Student discussion					
Individual study					
Listening to educational experts					
Course projects					
Personal experiences					
Student sharing of experiences					
Other personal life experiences					

Reports					
Emails					
Thinking about education and learning					
Personal insight					
OTHERS INSIGHT ABOUT EDUCATION					
Statement made by authorities					
Education related shows					
Popular educational books					
Working with other people					
Education internships					
Listening to educational leaders					
Body language					
Comparison of multiple educational institutions					
Lengthy educational conversations					
Visual information (i.e., charts, diagram, figures, pictures)					
Degree programs in education					

Appendix II

Validation Certificates

VALIDATION CERTIFICATE

Exploration of Knowledge Creation Practices of University Teachers

This is certifying that the standardized questionnaire adopted by the Ms. Hira Habib (PhD Scholar, System ID # PD-EDU-AS17-ID-005) towards her thesis has been assessed by me and I find it to have been designed adequately to explore "Exploration of Knowledge Creation Practices of University Teachers".

It is considered that the research instrument, developed for the above-titled research, is according to the objectives. It assures adequate construct and content validity according to the purpose of the research, and can be used for data collection by the researcher with fair amount of confident.

Name _Dr. Muhammad Arshad Dahar_
Designation _Assistant Professor._
Institute _Deptt. of Education._
Signature _PMAS Arid Agriculture University Rawalpindi._
20/5/2019.

VALIDATION CERTIFICATE

Exploration of Knowledge Creation Practices of University Teachers

This is certifying that the standardized questionnaire adopted by the Ms. Hira Habib (PhD Scholar, System ID # PD-EDU-AS17-ID-005) towards her thesis has been assessed by me and I find it to have been designed adequately to explore "Exploration of Knowledge Creation Practices of University Teachers".

It is considered that the research instrument, developed for the above-titled research, is according to the objectives. It assures adequate construct and content validity according to the purpose of the research, and can be used for data collection by the researcher with fair amount of confident.

Name _Dr. M. Imran Yousaf_

Designation _____

Institute _____

Signature _____

CHAIRMAN
Department of Education
PMAS-Arid Agriculture University
Rawalpindi

VALIDATION CERTIFICATE

Exploration of Knowledge Creation Practices of University Teachers

This is certifying that the standardized questionnaire adopted by the Ms. Hira Habib (PhD Scholar, System ID # PD-EDU-AS17-ID-005) towards her thesis has been assessed by me and I find it to have been designed adequately to explore "Exploration of Knowledge Creation Practices of University Teachers".

It is considered that the research instrument, adopted for the above-titled research, is according to the objectives. It assures adequate construct and content validity according to the purpose of the research, and can be used for data collection by the researcher with fair amount of confident.

Name _____ Allah Bakhsh _____

Designation _Ex Head of Deptt/Edu_

Institute _____ NUML Islamabad _____

Signature _____ Allah Bakhsh _____

Appendix III
List of Universities

Sr.No	Universities	Sector	Discipline	Total Faculty
	ISLAMABAD			
01.	Air University	Public	General	256
02.	Allama Iqbal Open University (AIOU)	Public	General	189
03.	Baharia University	Public	General	557
04.	COMSATS institute of Information Technology	Public	General	841
05.	Capital University of Science and Technology (CUST)	Private	General	197
06.	Federal Urdu University of Arts, Sciences & Technology	Public	General	224
07.	Foundation University, Islamabad (FUI)	Private	General	391
08.	Institute of Space Technology (ICT)	Public	General	139
09.	International Islamic University (IIU)	Public	General	695
10.	Muslim Youth University	Private	General	35
11.	National Defense University (NDU)	Public	General	51
12.	National University of Computer & Emerging Sciences (FAST)	Private	General	169
13.	National University of Modern Languages (NUML)	Public	General	470
14.	National University of	Public	General	839

	Science and Technology (NUST)			
15.	National University of Technology (NUTECH), Islamabad	Public	Engineering & Technology	46
16.	Pakistan Institute of Development Economics (PIDE)	Public	General	37
17.	Pakistan Institute of Engineering & Applied Sciences (PIEAS)	Public	General	153
18.	Quaid-i-Azam University (QAU)	Public	General	316
19.	Riphah International University	Private	General	363
20.	Shaheed Zulfiqar Ali Bhutto Medical University	Public	Medical	127
21.	Shifa Tameer-e-Millat University	Private	General	218
22.	Sir Syed (CASE) Institute of Technology, Islamabad	Private	General	61
	RAWALPINDI			
23.	Fatima Jinnah Women University (FJWU)	Public	General	193
24.	HITEC University	Private	General	120
25.	National University of Medical Sciences (NUMS)	Public	Medical	43
26.	Pir Mehr Ali Shah Arid Agriculture University	Public	General	253

27.	Rawalpindi Medical University	Public	Medical	186
28.	University of Engineering & Technology, Taxila (UET)	Public	General	277
29.	University of Wah	Private	General	179

https://www.hec.gov.pk/english/universities/

List of Universities with Total Faulty of Natural Sciences and Social Sciences

Sr.No	Universities	Sector	Discipline	Total Faculty (NS & SS)
	ISLAMABAD			
01.	Air University	Public	General	74
02.	Allama Iqbal Open University (AIOU)	Public	General	141
03.	Baharia University	Public	General	352
04.	COMSATS institute of Information Technology	Public	General	443
05.	Capital University of Science and Technology (CUST)	Private	General	34
06.	Federal Urdu University of Arts, Sciences & Technology	Public	General	183
07.	Foundation University, Islamabad (FUI)	Private	General	314
08.	Institute of Space Technology (ICT)	Public	General	60
09.	International Islamic University (IIU)	Public	General	483
10.	Muslim Youth University	Private	General	05
11.	National Defense University (NDU)	Public	General	35
12.	National University of Computer & Emerging Sciences (FAST)	Private	General	19
13.	National University of	Public	General	326

	Modern Languages (NUML)			
14.	National University of Science and Technology (NUST)	Public	General	248
15.	Pakistan Institute of Development Economics (PIDE)	Public	General	37
16.	Pakistan Institute of Engineering & Applied Sciences (PIEAS)	Public	General	33
17.	Quaid-i-Azam University (QAU)	Public	General	274
18.	Riphah International University	Private	General	287
19.	Shaheed Zulfiqar Ali Bhutto Medical University	Public	Medical	127
20.	Shifa Tameer-e-Millat University	Private	General	218
	RAWALPINDI			
21.	Fatima Jinnah Women University (FJWU)	Public	General	136
22.	HITEC University	Private	General	18
23.	National University of Medical Sciences (NUMS)	Public	Medical	43
24.	Pir Mehr Ali Shah Arid Agriculture University	Public	General	75
25.	Rawalpindi Medical University	Public	Medical	186
26.	University of Engineering & Technology, Taxila (UET)	Public	General	16

27.	University of Wah	Private	General	122
	Total			4289
	TOTAL (by excluding FAST and ARID (Pilot Testing)			4195

M Gmail   **Hira Habib <hira.habib1988@gmail.com>**

PERMISSION FOR USING RESEARCH INSTRUMENT FOR DATA
5 messages

Hira Habib <hira.habib1988@gmail.com>   Tue, Oct 16, 2018 at 10:40 PM
To: jggerard@wne.edu

Respected Sir,

I am Hira Habib form Pakistan. I am a student of Ph.D. (Education) from University of
Modern Languages, Islamabad. I am writing to ask written permission to use the instrument that is
used in your research article "Measuring knowledge source tacitness and explicitness: A comparison
of paired items". I am conducting research entitled " Exploration of Knowledge Creation Practices of
University Teachers" in which I am using the "Nonaka's theory of organizational knowledge" that also
includes the explicit and tacit knowledge.

I would like to use and reproduce your instrument under the following conditions:

· I will use the instrument only for research purposes
· I will include a statement of attribution and copyright on all copies of the instrument. If
you have a specific statement of attribution that you would like for me to include, please
provide it in your response.
· At your request, I will send a copy of my completed research study to you upon
completion of the study and/or provide a hyperlink to the final manuscript

It is requested to give me permission of using your instrument on above terms and
conditions. If these are acceptable terms and conditions, please indicate so by
replying to me through e-mail.

Sincerely,
Hira Habib

Joseph Gerard <joseph.gerard@wne.edu>   Wed, Oct 17, 2018 at 12:21 AM
To: Hira Habib <hira.habib1988@gmail.com>

I'm happy to do so, Hira. Is there anything that you might need from me?

Do you have the instrument already?

[Quoted text hidden]

Hira Habib <hira.habib1988@gmail.com>   Wed, Oct 17, 2018 at 12:26 AM
To: Joseph Gerard <joseph.gerard@wne.edu>

Thank you sir for your reply.... Just need for your permission to use your instruments for my research that you used in your article entitled "Measuring knowledge source tacitness and explicitness: A comparison of paired items".

[Quoted text hidden]

Joseph Gerard <joseph.gerard@wne.edu>   Wed, Oct 17, 2018 at 12:46 AM
To: Hira Habib <hira.habib1988@gmail.com>

You have my permission and best wishes. I thought the study results were interesting and I've wanted to go back and do more with it.

[Quoted text hidden]

Hira Habib <hira.habib1988@gmail.com>   Wed, Oct 17, 2018 at 12:47 AM
To: Joseph Gerard <joseph.gerard@wne.edu>

Thank you so much sir... Happy to take your permission.
[Quoted text hidden]

Permission Letter 2

Re: Fw: PERMISSION FOR USING RESEARCH INSTRUMENTS FOR DATA

jchuang <jchuang@nccu.edu.tw>
To:

• You
Sun 10/28/2018 7:13 AM

Hi Hira Habib,
Yes, you are welcomed to use the instrument. Wish your study go smooth.

Best,

Jia-Chi Huang
Professor of Dept. of Business Administration
Associate Dean of College of Commerce, National Chengchi University
Phone: 886-2-29393091 ext.81104
Fax: 886-2-29398005

-----Original message-----
From: hira habib<hira.habib1988@hotmail.com>
To: jchuang<jchuang@nccu.edu.tw>
Date: Sun, 28 Oct 2018 08:59:34

Subject: Fw: PERMISSION FOR USING RESEARCH INSTRUMENTS FOR DATA

Sent from my Huawei Mobile

-------- Original Message --------
Subject: PERMISSION FOR USING RESEARCH INSTRUMENTS FOR DATA
From: hira habib
To: jchuang@nccu.edu.tw
CC:

Respected Sir,

I am Hira Habib form Pakistan. I am a student of Ph.D. (Education) from University of Modern Languages, Islamabad. I am writing to ask written permission to use the instrument that is used in your research article "Knowledge Conversion Abilities and Knowledge Creation and Innovation: A New Perspective on Team Composition". I am conducting research entitled " Exploration of Knowledge Creation Practices of University Teachers" in which I am using the "Nonaka's theory of organizational knowledge" that is based on socialization, externalization, combination, and internalization (SECI) and your instrument fulfill the requirement of this theory.

I would like to use and reproduce your instrument under the following conditions:

- ·	I will use the instrument only for research purposes
- ·	I will include a statement of attribution and copyright on all copies of the instrument. If you have a specific statement of attribution that you would like for me to include, please provide it in your response.
- ·	At your request, I will send a copy of my completed research study to you upon completion of the study and/or provide a hyperlink to the final manuscript

It is requested to give me permission of using your instrument on above terms and conditions. If these are acceptable terms and conditions, please indicate so by replying to me through e-mail.
Sincerely,
Hira Habib

Appendix V
Certificate of Proofreading

CERTIFICATE OF PROOFREADING

It is certified that the undersigned has proofread the thesis titled, "Exploration of Knowledge Creation Practices of University Teachers". The thesis is free of grammatical errors and ready to be defended by Ms Hira Habib, Ph.D Scholar, Faculty of Education, National University of Modern Languages, Islamabad.
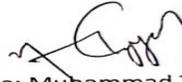
29/11/2022

Name: Muhammad Tayyab
Designation: Assistant Chief (Education)
Ministry of Planning, Development &
Special Initiatives, Islamabad

Muhammad Tayyab
Assistant Chief
M/o Planning, Development & Special Initiatives,
Islamabad.