Evaluation of Integrating Knowledge Management and E-Learning Towards Improved Learning Framework: KSA Case Study

Assessment Study of Linking KM with EL Factors Aiming to Improve the Learner Performance in the Kingdom of Saudi Arabia, Based on the New Bloom's Taxonomy Framework

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Abstract

The globalisation of commerce, alongside growing information on the Internet, has increased the demand of E-Learning (EL). Furthermore, knowledge management (KM) is capable of generating significant organisational/institutional competitive advantages.

KM and EL systems contribution to the requirements of education has resulted in their increased demand of their integration across business/academic world.

Bloom's Taxonomy of Educational Objectives is one of the most widely used framework of organising levels of expertise. Bloom's different cognitive domains are based on a hierarchy of learning which progresses from simple to complex and from concrete to abstract.

This study considers ways to improve higher education in Saudi Arabia, based on the significant factors (of KM/EL systems) contributing to learner performance and the way in which New Bloom's Taxonomy could potentially affect/benefit these individual systems; previous academic works will be considered, in an attempt to achieve higher standards of education using this theory/framework.

This research presents the value of learning process/tactical approaches, to encourage staff and students to accept the idea of integrating EL and KM factors under New Bloom's Taxonomy; examples will be given to demonstrate instances where systems have been adopted successfully.

To investigate the effectiveness of New Bloom's Taxonomy on the integration of EL and KM factors in Saudi higher education, a questionnaire methodology was chosen to collect data from experts of both systems; furthermore, the public sector was chosen as it has adopted both systems. Therefore, an integrated framework is proposed.

Keywords

Knowledge Management (KM), E-Learning (EL), New Bloom's Taxonomy, Sharing Knowledge, Developing Country, Higher Education.

Declaration

I hereby declare that this thesis has been sincerely carried out by myself and has not been used in any earlier application for a degree. The important participation of others in this thesis has been acknowledged where appropriate.

Fatimah Alhuzali

Acknowledgements and Dedications

(الحمد لله فاطر السموات والارض)

In the name of Allah, the most gracious, the most merciful. All praise is due to Allah, the Lord of the worlds, and blessings and peace be upon our Prophet Muhammad. I therefore wish to extend my deep gratitude to God who gave me all the power to finish my studies.

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Nomenclature

CSF	Critical Success Factor
DEMATEL	Decision Making Trial and Evaluation Laboratory
EL	E-learning or electronic learning
ICT	Information Communication Technology
IS	Information Systems
KAU	King Abdul-Aziz University
KM	Knowledge management
KSA	Kingdom of Saudi Arabia
LOs	Learning Domains
MoHE	Ministry of Higher Education in KSA
PDP	Personal Development Plan
SAGIA	Saudi Arabian General Investment Authority

Chapter 1: Introduction

This chapter introduces the research scale of the thesis topic, along with the specific outline of the content. The emergence and development of knowledge management (KM) and e-learning (EL) is addressed in the first section. The second section outlines the problem statement along with the research hypothesis and the significance of the study. The final section addresses the research structure and its contributions.

The general framework of the thesis is based on KM along with EL and the ultimate combined use of both of these aspects in the framework of New Bloom's Taxonomy.

1.1 Background

1.1.1 Knowledge Management

In organisations, one of the most essential resources recognised is knowledge (Debowski, 2006). Knowledge can be defined as the procedure involving the translation of information or data, alongside the experience that an individual understands and applies in their work (Debowski, 2006). It is important because knowledge can help to attain organisational outcomes and competitiveness in an efficient manner.

The two main types of knowledge are tacit and explicit knowledge, each will now be addressed in turn.

1.1.1.1 Tacit Knowledge “Know-How”

According to Frappaolo (2002), the knowledge that is attained from experience is known as tacit knowledge. Tacit knowledge, also referred to as analogue knowledge, is defined as the knowledge that is context specific and personal, so the formalisation of this type of knowledge is quite difficult. In general, people restore the knowledge within themselves/their minds, so the access of this kind of knowledge is difficult. For instance, the knowledge embedded within an expert’s mind is tacit knowledge (Frappaolo, 2002). Consequently, there are major difficulties in attempting to document or verbalise tacit knowledge, which makes it problematic in transferring this knowledge to another person. For instances, in various organisations, the staff members can develop tacit knowledge at a high level through ongoing learning, personal experiences and analysis of resources. Thus, the major issue facing organisations is that they do not know how to translate this tacit knowledge into an accessible form or product. Furthermore, organisations find it difficult to firstly identify the people who have such tacit knowledge, secondly they then face the challenge of not knowing how to utilise it when required (Frappaolo, 2002).

1.1.1.2 Explicit Knowledge “Know-What”

Explicit knowledge is the type of knowledge that can be transmitted in a systematic format, it is also known as digital knowledge or codified knowledge. Explicit knowledge is easily transmitted, coded and stored in a specified media for easy access to others. Documents, manuals, audio-visuals or procedures are the main ways in which explicit

knowledge will be stored; to illustrate, an encyclopaedia is a form of explicit knowledge. Explicit knowledge is usually the main resource for organisations and workers (Frappaolo, 2002).

Knowledge management can be defined as the procedure of recognising, organising and analysing the intellectual assets that are crucial for the long-term performance of the organisation (Frappaolo, 2002). According to Maier (2007), the procedure of collecting, analysing and utilising knowledge itself is known as KM. Knowledge management can also be defined as the process of generating, sharing, identifying, attaining and utilising knowledge to increase the overall performance of the organisation through learning. According to Firestone and McElroy (2003), KM is a means to use and convert knowledge in order to bring improvement in the performance of the organisation.

1.1.2 E-Learning

There is no certain date that indicates the origin of the term e-learning (EL), but it is generally assumed that it originated in the 1980s, during this same timeframe, it is believed that the term online learning originated.

Various definitions of EL, from a number of authors, have been included within this thesis. These definitions may present some conflicting views and different characteristics in relation to other definitions. To illustrate, in previous studies relating to EL, it has been defined that EL can be accessed through the use of web-distributed, web-based or web-capable technological tools. Consequently, EL has a wide scope, it includes the use of electronic media, including the Internet or an intranet, interactive

TV, audio and videotape, CD-ROM, and/or satellite broadcast (Clark and Mayer, 2003). It has been noted that some of the earlier technologies used were essentially insufficient for deciphering or acting as a descriptor (Mayer, 2005).

Also been observed that there is a lack of capability in the developing countries to put into practice advanced educational practices, such as EL (Mayer, 2005).

1.1.3 Integrating E-Learning with Knowledge Management

In recent research, conducted by Lam et al. (2013), the concept of KM was introduced to EL systems – specifically, it was argued that an EL system could be facilitated through KM.

Both KM and EL share the same fundamental goal of facilitating organisational learning. Various researchers have tried to analyse the similarities in goals, methods of assessment and knowledge sharing of both EL and KM (Liebowitz and Frank, 2010). Certain characteristics were found between EL and KM by Pirmoradi et al, (2011), including: system architecture, collaboration and communication, personalisation of delivered information and access rules. In order to improve the effectiveness of EL, the concept and methods of KM should be employed within it (Liebowitz and Frank, 2010).

The effectiveness of EL is highly dependent on the quality of knowledge content, which in turn is highly dependent on the success of knowledge capture, storage and innovation. Knowledge management incorporates the use of knowledge sharing and dissemination, this is an important tool in building an organisation’s assets, it also helps to improve the

performance of an individual, group and/or organisation. In an organisation, learning is helpful in achieving organisational goals and needs, it also focuses on organisational systems, structures, policies and institutional forms of knowledge so as to link individual and organisational learning together (Lam et al., 2013). The concept of KM can be employed within EL to improve the effectiveness of EL and to enhance the learning platform in an organisation. Consequently, both KM and EL focus on increasing the learning in an organisation.

1.1.4 Bloom's Taxonomy and Revised Taxonomy

Bloom's Taxonomy plays an important part in improving critical thinking in students; this is important as students need skills that will help them to solve problems and think critically, both in and out of the classroom. Armstrong (2015) provided detailed background information about this theory; specifically, Benjamin Bloom, with collaboration from Max Englehart, Edward Furst, Walter Hill and David Krathwohl, published a framework in 1956 to categorise educational goals of taxonomy of educational objectives, this became known as Bloom's Taxonomy. The framework focuses on six main categories, namely: knowledge, comprehension, application, analysis, synthesis, and evaluation and knowledge that are necessary to implement skills and abilities into action. All of the categories, with the exception of "knowledge" became known as the "skills and abilities" category. Each taxonomy is popularly remembered due to its categorisation which can be further subdivided from simple to concrete divisions. Armstrong (2015) explained these main categories as knowledge

involving the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting. Each category will now be addressed in turn:

- Comprehension: refers to understanding or interpreting what has been communicated to ultimately make use of ideas and materials without relating them to some other material or idea. It is known as the ability of the mind to understand and perceive.
- Application: refers to the special use of an abstract to which something is put.
- Analysis: represents understanding the nature of something by breaking it into constituent elements or parts to ensure that the idea interpreted is clear and the relation between the ideas is addressed properly.
- Synthesis: combines two or more elements together so that they take the form of a new element.
- Evaluation: involves judging the merit, worth and significance by a set of standards.

Table 1.1: The Revised Taxonomy

Remember	Understand	Apply	Analyse	Evaluate	Create
Recognising Recalling	Interpreting Exemplifying Classifying Summarising Inferring Comparing Explaining	Executing Implementing	Differentiating Organising Attributing	Checking Critiquing	Generating Planning Producing

Source: Armstrong (2015)

There are several benefits from using the New Taxonomy, in particular it also supports the thinking level of the teachers and the students in the following ways:

1. Objectives or learning goals are important as it helps to establish the purpose of the educational interchange for both students and teachers.

2. Teachers can benefit from using the framework by helping them to establish objectives, it will also help them to clarify things that need be to be done by the students, as well as the teachers.

3. Having an organised set of objectives helps teachers to:

    - Plan and deliver proper instructions to the students;
    - Valid designing of assessment tasks and strategies; and,
    - Ensuring instructions and assignments are designed along with the objectives (Armstrong, 2015).

In order to achieve a new learning phase in developing countries like Saudi Arabia, this research is conducted to identify the important factors of both KM and EL systems to achieve a New Bloom's Taxonomy. This research is to be conducted in Universities as these institutions utilise a perfect combination of EL and KM by integrating concepts, knowledge and established guidelines to achieve a new level of learning so as to provide scope in New Bloom's Taxonomy. This chapter presents the aim of the study along with the relevant hypothesis while it relies on the expert views (DEMETAL method is used) and literature as measures to predict success of the proposed approach.

1.2 Problem Statement

The Internet is increasingly being used in the education sector and so is the concept of EL. A Likert scale was used to demonstrate the difference in the intensity of the selected items (McLeod, 2008). The responses were dependent on the attitude of the respondents; if respondents are permitted to answer away from this standard format, it can become difficult for the researcher to evaluate and analyse the results. E-learning is gaining popularity as more and more people are easily accessing data through the Internet; thus, it makes use of digital content and provides a learner oriented environment to both students and teachers (Cohen, 2010). Unfortunately, developing countries face several challenges in implementing EL, as these tools are being transferred from more developed countries. Furthermore, the popularity of KM is also increasing (Christensen, 2003). This research aims to identify the significant factors of both KM and EL, in terms of how they contribute to the achievements of learning performance in Saudi Arabia.

1.3 Research Approach

The research approach is summarised below in Figure 1.2.

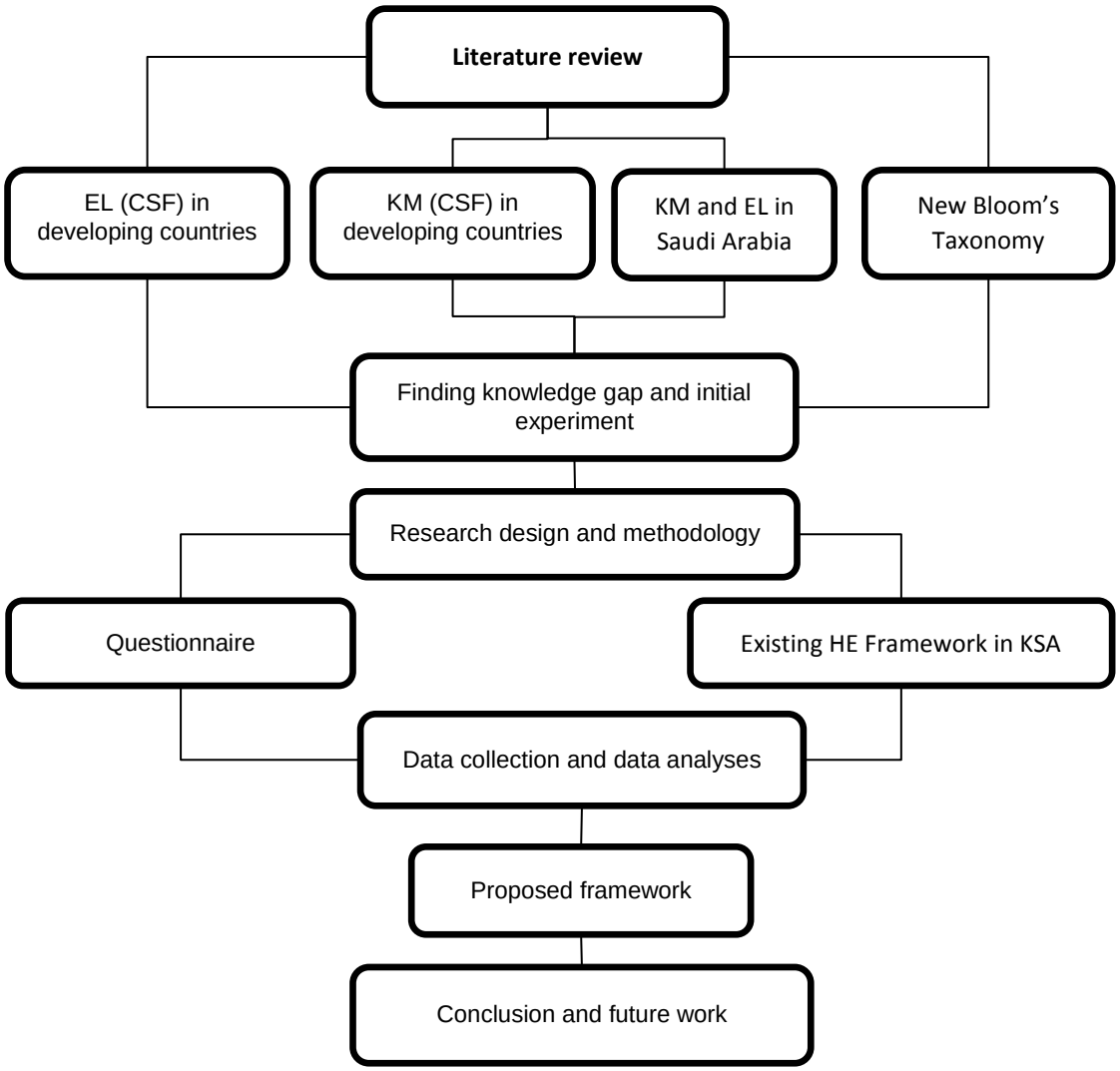


Figure 1.1: Research Approach

1.4 Research Hypotheses

H1. Within the New Boom's Taxonomy Framework, there are EL factors that can contribute towards improved learner performance.

H2. Using the same Bloom's Taxonomy Framework, KM factors can positively influence learner performance.

H3. There is a link between the KM and EL factors; such a link can have positive impact on the learner's performance, based on the New Bloom's Taxonomy Framework. This can be categorised as:

A. The KM factor "Storage and Sharing the Knowledge" has positive influence on the EL factor "Perceived Usefulness", and vice versa.

B. The KM factor "Continual Learning" can affect the EL factor "Course Quality – Understand the Knowledge", and vice versa.

C. The KM factor "Organisational Learning" can affect "Attitude towards EL – Apply the Knowledge", and vice versa.

D. The KM factor "Organisational Culture" can affect "Computer Self-Efficacy – Analyse the Knowledge", and vice versa.

E. The KM factor "Employee Empowerment" can affect "Computer Training – Evaluate the Knowledge", and vice versa.

F. The KM factor "Top Management" affects "Programme Flexibility – Create the Knowledge", and vice versa.

1.5 Significance of the Study

The importance of this study stems from the fact that it will contribute to addressing the barriers of using EL and KM in higher education in the Kingdom of Saudi Arabia

(KSA). It is expected that this study will help to clarify the extent to which the integration of EL and KM factors can improve student achievement at the university level, as well as attain positive attitudes towards learning by using the New Bloom's Taxonomy Framework.

This study will also attempt to present a framework that is based on both the present teaching framework at the university level in the KSA and the New Bloom's Taxonomy Framework.

1.6 Research Aims

This research aims to study how the critical factors (CFs) of EL and KM can impact upon learner performance in the higher education sector of the Kingdom of Saudi Arabia – this will be based on the New Bloom's Taxonomy Framework. The investigation of these critical success factors (CSFs) will be grouped into three major categories, namely: EL CSFs, KM CSFs and the combination of EL and KM CSFs. Each of these categories may have their own effect on different aspects of the learner in higher education in Saudi Arabia.

1.7 Research Objectives

I. To better understand the interaction between EL and KM factors in order to provide useful recommendations for improved learner performance in higher education in developing countries.

II. To assess the degree of effectiveness of EL factors on learner performance in higher education while considering the New Bloom's Taxonomy (learning process) Framework in Saudi higher education.

III. To assess the degree of effectiveness of KM factors on learner performance in higher education while considering the New Bloom's Taxonomy (learning process) Framework in Saudi higher education.

IV. To investigate the use of combined EL and KM factors as part of a learning framework.

V. To document CSFs that facilitate effective implementation of KM and EL in Saudi Arabia's higher education sector.

VI. To validate the findings of the primary data.

1.8 Research Contributions

This research aims to provide some prescriptive guidelines to improve learner performance in the higher education sector of developing countries, it will also address an interesting approach of combining KM and EL factors in an established Bloom's Taxonomy Framework. The role of this study is to bridge the gap in the existing literature by considering the integration of KM and EL CSFs in Saudi Arabia, as a specific case study. Furthermore, this research will propose a number of significant factors, from both the KM and EL fields, that could have a positive impact on learner performance.

1.9 Research Structure

The "learning structure" of the New Bloom's Taxonomy will be used to determine whether learner performance in Saudi Arabia's higher education will be improved. Semi-structured questions will be utilised to explore the effective factors from EL and KM systems; consequently, a methodology of quantitative approaches will be used. In order to achieve learner performance, experts of both of these systems will be investigated; as a result, various critical factors and findings of the literature review will be identified, along with the quantitative data to achieve the ultimate aim of the study. This experiment will use both EL and KM systems, along with the use of the New

Bloom's Taxonomy, with the ultimate objective of understanding how to improve learner performance in Saudi Arabia.

1.10 Thesis Outline

The remaining chapters of this thesis will be organised as follows.

Chapter 2, the literature review, will review and explore issues related to EL and KM from the perspective of: (i) the CSFs in developing countries (i.e. Saudi Arabia), (ii) the barrier of each system in developing counties, (iii) the relationship between factors from both systems in developing counties, and (iv) how these CSFs can affect learner performance in developing counties that use the New Bloom's Taxonomy Framework.

Chapter 3, the research design and methodology, will present and discuss the research methodology used for this research.

Chapter 4, the DEMATEL method, will investigate the relationship between the EL and KM factors, based on the New Bloom's Taxonomy learning process framework, by applying the DEMATEL method.

Chapter 5, the quantitative data analysis, will present and discuss the findings from the quantitative steps of the research.

Chapter 6, the discussion of the key findings, will summarise the findings from the various research stages. It will also critically review these findings, by also discussing

suggestions and contributions that this study makes to the field of learner performance development, by integrating EL and KM under the umbrella of New Bloom's Taxonomy Framework.

Chapter 6, the conclusions and future work, will discuss the conclusions that may be drawn from the findings of this study. Furthermore, any limitations associated with this study will be discussed and suggestions will be made regarding directions for future research.

Chapter 2: Literature Review

This chapter will present a review of the available literature on knowledge management and e-learning. The objectives, components and factors affecting KM for EL will therefore be discussed and any common characteristics of KM and EL systems will also be investigated. Furthermore, any connections between EL and KM will be explored by studying the link between their factors.

The way in which EL systems can enhance KM will be critically evaluated and the factors affecting KM for EL will be discussed. Along with the objectives, the merits and demerits and the theoretical framework of the EL and KM systems will be critically analysed. Major aspects of KM, such as history and importance, will also be discussed. Any barriers to the integration of KM with EL will be critically examined. In this regard, the New Bloom's Taxonomy Framework will be explained further. An analysis of KM and EL, with respect to individuals, communities and organisations, would also be performed.

The main learning objective is to study the positive influences in Saudi Arabia's higher education that are as a result of the integration of EL and KM.

2.1 Introduction to Knowledge Management

2.1.1 Definition of Knowledge

According to the old paradigm, knowledge is considered power, which reflects why it is becoming strategically imperative to organisations. One should develop it, disseminate it and keep it protected, in order to truly take advantage of it.

People commonly believe that one should hold onto their knowledge, as this makes them a valuable asset to an organisation. In present times, although knowledge is considered to be an enormous power, from the perspective of the organisation this understanding has changed somewhat. By challenging the old paradigm, the new paradigm says that in order for the knowledge to grow, it is necessary for it to be shared within the organisation (Filemon and Uriarte, 2008).

Table 2.1 shows that, in general, knowledge has more value than information as it can be interpreted differently; interestingly, this can include a person's experiences and beliefs as these help to drive them and help in their decision making. Knowledgeable experts can access knowledge through collaboration and communication, since it is dynamic in nature (Cormican and Sullivan, 2003). According to Amine (2012), knowledge should be seen in the larger context of our culture, as then it becomes more meaningful as it has evolved out of human beliefs and philosophy.

Table 2.1: Knowledge Definition

References	Knowledge definition
Nonaka and Takeuchi (1995)	A dynamic human process that seeks justification of personal beliefs towards the truth.
Sveiby (1997)	A capacity to act
Davenport and Prusak (1998)	Knowledge is a smooth mixture of framed experiences, values, contextual information and expert insight that helps in evaluation and incorporation of new experiences and information by providing a proper framework.
Kantner (1999)	The power to act and create decisions.
Bollinger and Smith (2001)	Knowledge is the understanding, awareness or familiarity achieved over a duration of time, by the means of study, investigation, observation or experience. It is based on one's personal experiences, skills and competencies, and is information derived out of individual interpretation.
Wiig (2000)	Knowledge is possessed by humans or other active entities, which includes truth, beliefs perspectives, expectations, judgments, methodologies and know-how which is applied and used to receive, recognise, analyse, evaluate, synthesise, decide, implement, monitor and adapt the information.

Source: Al Sadhan (2007)

2.1.2 Knowledge Hierarchy

Fred McVittie (2010) noted that in order to gain more insight into KM, it is necessary to primarily understand the concept of knowledge and how this differs from data and information. These differences can be explored further, a summary of which is presented below in Table 2.2.

Table 2.2: Difference aetween Data, Information and Knowledge

Data	Information	Knowledge
Depending largely on the context of its use, there are various definitions for data. For example, data is regarded as unprocessed information by information scientists, whereas it is defined as a representation of objective facts by the other domains (Al-Bastaki and Shajera, 2013).	Information is regarded as corpuscular, measurable, commoditised, objective, shareable, transparent and autonomous. It has shape and can be processed and made available, generated and created, transferred, stored, sent, distributed (Al-Bastaki and Shajera, 2013).	Knowledge is moulded and "shaped" by an individual's existing perceptions and experiences, which are internalised by the knower (Al-Bastaki and Shajera, 2013).

Source: Fred McVittie (2010)

2.1.3 Type of Knowledge

Explicit knowledge is defined as information, this can be formulated in words or symbols and can therefore be stored, retrieved, copied or transferred into forms such as written documents or computer files which can be used at any time (Hansen et al., 1999). Whereas, *tacit knowledge* is defined as knowledge that has not been explicitly formulated, as a result it cannot be stored, retrieved, copied or transferred because it relates highly to the individual (Fleck, 1996).

2.1.4 Knowledge Management Definition

Knowledge is not easily measured or audited, so organisations must manage knowledge effectively in order to take full advantage of the skills and experience inherent in their systems and structures, as well as to capture the tacit knowledge belonging to their employees. Kanagasabapathy et al., (2006) have listed the definition of KM as stated in Table 2.3 concluding that Knowledge Management is a managerial activity which

develops, transfers, transmits, stores and applies knowledge, it also provides the organisation's members with real information to enable them to react and make the right decisions, in order to attain the organisation's goals.

Table 2.3: Knowledge Management Definitions

Author	Definition of KM
Quintas (2002)	KM helps in meeting present and future needs through an appropriate management process that encourages exploring, developing, utilising, delivering and absorbing knowledge, inside and outside the organisation.
Alavi and Leidner (2001)	KM is managing the corporation's knowledge through a systematically and organisationally specified process for acquiring, organising, sustaining, applying, sharing and renewing both the tacit and explicit knowledge of employees to enhance organisational performance and create value.
Chua (2004)	KM is a process by which important information and expertise is found, selected, organised and disseminated to help organisations to perform their necessary activities.
Bhatt (2001)	KM is a process of knowledge development, validation, presentation, distribution and implementation.
Holm (2006)	KM helps individuals to create knowledge and information sharing, allowing them to act upon it so that the right information is delivered to the right people at the right time.
Montano (2005)	KM is the development, extraction, conversion and storage of the right knowledge and information so that it helps in framing better policies, modifies actions and facilitates results.
Kinney (1998)	KM is also defined as the process by which an organisation creates, captures and uses knowledge to support and improve the performance of the organisation.
Quintas (2002)	From the viewpoint of organisation, KM is considered as the process of managing knowledge critically so that existing needs could be met, and to identify and exploit current and acquired knowledge assets and artefacts in creating new knowledge in order to acquire advantage of new opportunities and challenges.
White (2002)	KM is differently viewed, but according to the author it is regarded to be an important part of innovation in organisations.
Quintas (2002)	KM is termed as a business activity that creates a direct link between the intellectual assets of an organisation – both explicit and tacit knowledge – and positive business results. It treats the knowledge component as an explicit concern of business activities reflected in strategy, policy and practice at all levels of the organisation.

Source: Kanagasabapathy et al., (2006)

2.1.5 Knowledge Management (KM) Process

Organisations currently view knowledge as a major factor for competitiveness. The KM process is considered an important asset in modern and successful organisations. The weaknesses and threats that affect organisations are likely to receive a faster counter-response by those embracing KM (Freeze and Kulkarni, 2007). A number of relevant KM processes, derived from the literature, are given below in Table 2.4.

Table 2.4: Knowledge Management (KM) Process

Processes Brief	References
Initiation, development, modelling, repository, distribution and transmission, use retrospect.	Lai and Chu (2000)
Development, storage and retrieval, transfer applications.	Alavi and Leidner (2001)
Acquisition, organisation, dissemination, implementation.	Parikh (2001)
Discovery, acquisition, creation, storage and organisation, sharing, use and apply.	Bouthillier and Shearer (2002)
Identification, acquisition, preparation, allocation, dissemination, usage, retention.	Stollberg et al. (2004)
Acquisition, coordination and induction, transmission and diffusion, creation.	Lei et al. (2000)
Organisation and retention, creation and acquisition, dissemination, utilisation.	Supyuenyong and Islam (2006)

Source: Louay Karadsheh et al. (2009)

2.2 Knowledge Management in Saudi Arabia

Even though the concept of knowledge management is fresh in Saudi Arabia, the local government has shown keen interest in launching KM programmes which could have an impact on the locals. In order to acquire KM tools and applications, several government

and private sector initiatives have been launched. One government sponsored mega project, worth two billion dollars, was launched under the name of Knowledge Economic City, in Al-Madinah Al-Mounawwarah. The main objective behind this project was to develop a knowledge-based industrial city (Kreiner, 2002).

Another similar initiative was established between a government organisation and the world's largest oil company, the Saudi Arabian Oil Company – Saudi Aramco, as it has shown keen interest in the improvement of its KM systems. With regard to this initiative, various KM applications, such as: best practices, lessons taught, virtual teams, communities of purpose and communities of practice, have been implemented and used by Saudi Aramco. For the purpose of developing an improved decision-making organisational environment, it is necessary to implement an effective KM system that focuses on organising the internal knowledge. To fulfil this purpose, the government agency of the Saudi Arabian General Investment Authority (SAGIA) is effectively working for it. The investors are provided with the required knowledge as SAGIA's KM system helps in the creation of knowledge (Mooradian, 2005).

2.2.1 Knowledge Management CSFs in Developing Countries

Table 2.5, below, summarises the critical success factors (CSFs) that have been found to be responsible for influencing KM in developing countries; Saudi Arabia, as a case study, has been discussed in several of these studies.

Table 2.5: KM CSFs in Developing Countries

KM (CSFs)	Function	References
Top Management Support	In an organisation where knowledge is developed and activities are inspired with the sharing of cultures, then the KM projects are successful. In order to create an important basis for competitive advantage, the effective management of knowledge is crucial. In terms of the successful implementation of KM, often the quality of poor leadership is considered as a threat.	Young (2008)
Organisational Learning	Organisational learning can be defined as a collective ability. Through the promotion of the human resource ability, learning organisations tend to increase their creativity, innovation and evolution.	Aragón-Correa et al. (2007), Pemberton and Stonehouse (2000), López et al. (2004), Dimitriades (2005)
Continual/ Continuous Learning	In any organisation, continuous learning means growth through learning events and experiences. It is a developmental process that is applied to individuals, teams and organisations – ultimately, it helps them to achieve overall organisational objectives. **Continuous Learning at the Individual Level** Continuous learning is beneficial as there is behavioural and perception change in an individual as they develop and polish their own thinking, skills and knowledge. **Continuous Learning at the Team Level** Continuous learning is beneficial for the team, as collectively any individual learning by the team members will be shared to encourage the acquisition of shared and fresh knowledge which results in team learning. **Continuous Learning at the Organisational Level** Continuous learning is provided through useful sources at this level, such as through feedback from the employees, from clients and from customers. For making decisions regarding necessary changes or developments essential for moving ahead; in addition, comments and ideas from the people of the group would be recorded.	Exforsys Inc. (2010)
Employee Empowerment	The employer transfers its own power to the employees. Through sharing of suitable information and the provision of factors that affect job performance.	Randolph (1995), Newstrom and Davis (1998), Ghosh (2013)
Organisational Culture	It can be stated that significant contributors in the successful implementation of KM include features like organisational culture, characteristics such as trust, common cultures and broad ideas of productive work.	Donate et al. (2010)
Storage and Sharing	The willingness to share knowledge requires a great deal	Skyrme and

KM (CSFs)	Function	References
the Knowledge	of involvement of the end-users in terms of two related aspects concerning the willingness to share knowledge among project participants. It explains the memory as a system of knowledge and skills that stores perceptions and experiences beyond the moment when they occur, so that they can be retrieved.	Amidon (1997), Probst et al. (2000)

Source: Hessami et al. (2012)

2.2.2 Barriers to Knowledge Management Saudi Arabia

In places like Saudi Arabia, it appears that the field of KM is still developing slowly; Mooradian (2005) explains that the conducted research mirrors this claim and it seems that according to the organisational goals and strategies, the application of KM systems and projects varies somewhat. Furthermore, there is considerable ongoing controversy as to the best selection of an optimal method to employ KM systems (Smith, 2001). This controversy is associated with the experiences of different barriers toward KM. It is hoped that the barriers to KM in Saudi Arabia will be identified with the help of this study. The four pillar model, given by Stankosky (2000), consists of the major categories of learning that focus on organisational behavioural aspects and social engineering. This model will be utilised as the basis for analysing the barriers to KM in this study. Each of these four pillars (presented in order of importance) will now be discussed with regards to their purpose and how necessary their attributes are for an organisation.

In order to ensure individual collaboration and to maximise the sharing of knowledge, firstly, the ***learning*** pillar focuses on suitable principles and practices necessary for a learning organisation.

Secondly, the ***leadership*** pillar involves values, objectives, knowledge requirements, knowledge sources, prioritisation and resource allocation of the organisation's assets of knowledge that when led properly will lead to successful environmental, strategic and enterprise-level decision-making processes.

Thirdly, the ***technology*** pillar is required to support and/or enable KM strategies and operations, in terms of many special technical or information technologies.

Fourthly, the ***organisation*** pillar is the host of many important operational aspects of knowledge assets, such as: functions, processes, formal and informal organisational structures, measures and metrics, process improvement and business process reengineering, all of which are of importance and need to be addressed.

Furthermore, according to Al Hussain (2012), Saudi Arabia identified the following major KM barriers which are categorised below.

Learning:

1. Knowledge-sharing: During learning, there should not be any sharing of knowledge.
2. Specialisation: There are too few KM education specialists.
3. Culture: At present, there is no culture for creative learning that promotes and develops knowledge.

4. Training: Less and improper training is demonstrated.

Leadership:

1. Experience: KM is ineffective since leaders lack experience.
2. Collaboration: Management resists collaborating on KM projects.
3. Work methodology: A work methodology that supports KM is apparently weak.
4. Procedures and standards: There is no leadership support for the purpose of creating standards and procedures that encourage knowledge sharing.

Technology:

1. Communication: There is an absence of efficient communication tools that support knowledge.
2. Employee expertise: For better technology management, there are too few (lacking) qualified human resources.
3. Outdated information: There exists expired and non-updated excessive information.
4. Archiving resources: There is a lack of technological resources to store knowledge.

Organisation:

1. Communication: Absence of effective organisational communications.
2. Culture: Knowledge-sharing culture is not present.
3. Training: Lack of organisational training.
4. Trust: Absence of trust across the whole of the organisation.

2.3 E-Learning Definition

There are several interlocking definitions of EL that aim to define the concept of it; however, there is no single definition which makes it very difficult for researchers to fully understand the correct meaning of it. Zauton (2005) presented a group of several views in his earlier review of the literature in an attempt to identify an appropriate multifaceted definition for the concept of EL (Al-Hazmi, 2011). These views can be summarised in the following eight groups.

First group

The view of the first group states that EL can be defined as a way of gaining education with the help of computers and the various useful programs they offer. This group defined EL as: E-learning means an approach to enhance learning by means of personal computer, CD-ROMs and the Internet (Wordiq, 2010).

Second Group

The second group defines EL as an education system, which includes the use of the Internet, and the tools and applications it provides. This group defined EL as the: Use of the Internet and associated technologies in education and distribution of learning resources (Moneta and Moneta, 2002).

Third Group

The third group suggests that EL consists of education through the networks; they defined EL as: The use of network technologies to create, deliver and facilitate learning, anytime and anywhere (Ageless Learner, 2006).

Fourth Group

The fourth group suggests that EL involves distance learning; they provided the following definition: E-learning is the same as distance education, which is the provision of curriculum education from the places near studying via sound, video image or computer technologies such as the Internet (Zauton, 2005).

Fifth group

The fifth group suggests that EL is education with the help of digital technology; they defined it as: The use of the Internet and digital technologies to create experiences that educate human beings (Wong, 2007, cited from Horton, 2002).

Sixth group

The sixth group claims that EL comprises of education through the use of communication and information technology; they provided the following definition: E-learning basically boils down to learning that is supported via information and communications technology (ICT) (E-Learning, 2010).

Seventh group

The seventh group explained the concept of EL as virtual learning; they defined EL as: Methods to provide education programmes for learners through the multimedia virtual alone, such as the Internet, distance conference, CDs and other techniques. (Fox, 2003).

Eighth group

The eighth group suggests that EL is the process of education through any electronic medium. They defined EL as: The delivery of education (all activities relevant to instructing, teaching and learning) through various electronic media. The electronic medium could be the Internet, intranets, satellite TV, video/audio tape, and/or CD-ROM (Cohen and Nycz, 2006; cited from Koohang and Harman, 2005).

All of these eight views are summarised below in Figure 2.1.

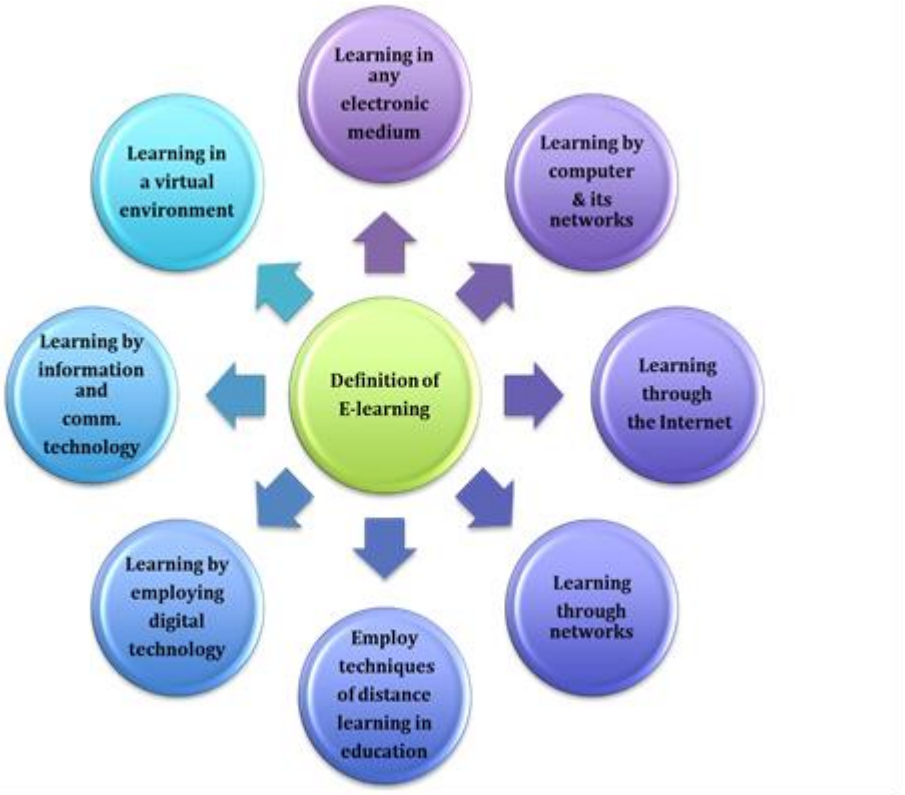


Figure 2.1: Views on the Definition of the Term "E-Learning"

Source: Al-Hazmi (2011) & Zauton, (2005)

2.3.1 History of E-Learning

This section highlights the history and development of EL. Along with it, the interactive potential of existing ICT applications has been highlighted more as compared to the complexities in the entire discussion. While considering the fact that EL is the form or the continuation of distance learning, its presence can be seen from the beginning of the 20th century, when a number of courses were being presented with the help of correspondence (Ruhe and Zumbo, 2009).

According to Kaufman (1989), distance learning consists of three generations, namely the first, second and third generations. All three generations differ in the fact that they have utilised different mediums of distance learning.

The first generation used correspondence, rather than enabling direct interaction between the learner and instructor. The second generation used multimedia content that was made specifically for distance learning. The third generation has made use of the Internet to enable interaction between the instructor and learners, and more recently also among the actual learners.

2.3.2 Four Types of E-Learning

Alqahtani (2010) stated that there are four types of e-learning, each of which will now be discussed in turn.

2.3.2.1 Synchronous E-Learning

Synchronous e-learning involves communication, with the use of the Internet, between the learner and instructor, at the same point of time and from different places. Therefore, in order to use this type of EL method, it is very important to have modern equipment and a good network connection, for example virtual classroom. There are various merits associated with this type of EL, which includes quick or even immediate responses and live interactions in an online environment, between the learner and the instructor (Finkelstein, 2009).

2.3.2.2 Asynchronous E-Learning

In contrast, asynchronous e-learning does not require the learners and instructors to be actively online at the same point of time. The advantage associated with this method of EL is that it is a very convenient means of learning for the student, as they can select a suitable time and place to access the Internet, they can also do their learning at their own pace using coursework delivered via web, email and message board. Asynchronous EL can be conducted via a number of mediums, including: discussion boards, social media, collaborative documents and e-mail (Jon, 2007).

2.3.2.3 Synchronous Virtual Classrooms

Synchronous virtual classrooms are in effect the classrooms for EL, they are supported by different software applications which enable the learners and the instructors to be online at the same point of time, but from different places, enabling communication with each other (Palloff and Pratt, 2013).

2.3.2.4 Asynchronous Virtual Classrooms

The asynchronous virtual classroom is a self-based system of EL in which the learners can access the instruction materials and can go through the content of the course, with the help of the Internet, at a time and place that is suitable for them. There are a number of advantages associated with this type of EL method, such as the flexibility of time. Thus, learners can login to the asynchronous virtual classrooms at a time which is appropriate for them, they can communicate with their instructors or their fellow

learners and they can also download or go through various documents (Clark and Kwinn, 2007).

2.3.3 Potential Advantages and Disadvantages of E-Learning

The potential pros and cons of EL are summarised by Al-Shorbaji et al. (2015) in the following Table 2.6.

Table 2.6: Potential Pros and Cons of EL

Advantages	Disadvantages
… to the Learners	
• The learners living in the remote geographical locations are also benefited with EL to a greater extent as it would enable the learners from the remote areas to save their time and the cost incurred for travelling and other accommodations (Rennie and Morrison, 2013). • It is easily accessible and flexible, specifically for the learners, as it enables the learners to undertake the learning session at a time and place suitable for them (Horton, 2002). • It may also result in improved access to educational facilities in the rural areas and in the developing countries (Rennie and Morrison, 2013).	• In the process of EL, the learner is unable to clarify their doubts related to all concepts, with the instructor (Piskurich, 2004). • E-learning involves a lack of control over the various aspects of the learning process, which acts as a crucial demerit for the learners (Piskurich, 2004). • The learners cannot carry out in-depth discussions on all topics, in the case of EL (Qun, 2011).
… to the Education Provider	
• E-learning may provide the acquisition of skills and the use of these skills for practising before practically experiencing it in the real world. It is very beneficial for the enhancement of the skills possessed by the learners as it involves practice and repetition of the skills (Sandars, 2006). • It also makes it very easy for the education provider to modify the course material (Sandars, 2006). • It is a very time-saving method of providing education. The instructor did not need to spend a lot of time on cognitive learning such as evaluation, synthesis and analysis, and it also permits the covering of very difficult and complex subjects also in the tutor-led workshops (Szucs et al., 2013).	• The most crucial disadvantage of EL is that EL resources are very time-consuming and expensive (Allen, 2008).
… in relation to the Teaching Philosophy	
• The EL process makes the learning session very	• The method of EL may not be

interactive and in accordance with the needs of the learners (Lazarinis, Green and Pearson, 2010). It makes the whole process into learner-based rather than instructor-based learning (Gerdprasert et al., 2011), and it is also able to accomplish the requirement of the curriculum which is essential for various universities and other educational institutions (Lazarinis, Green and Pearson, 2010).	appropriate for every field of education as some fields specifically need real group meetings and face-to-face interactions (Allen, 2008)

Source: Al-Shorbaji et al. (2015)

2.4 E-Learning in Developing Countries (Saudi Arabia)

In Saudi Arabia, King Abdullah introduced a new national plan to facilitate the adoption of IT, in all sectors of the economy and across the whole country. This national plan was particularly designed to implement EL and distance learning systems of education, with the aim of making education available at most universities in Saudi Arabia. The main concept was to transfer the traditional systems of education into a new style of technology that is fit for learning in the modern society (Remenyi, 2007). The Ministry of Higher Education (MOHE) set-up national centres that comprise both EL and distance learning routes. This national centre is known as the ELC, it organises the transformational changes from the traditional systems and it prepares the EL materials. Along with this, the MOHE developed a facility for the storage and retrieval of EL so that other universities could also adopt this new style system.

This particular system has been adopted and is highly preferred in various international universities; ultimately, it aims to enhance the learning and teaching process. Moreover, a few other universities have shown keen interest in terms of the adoption of this system

to improve their current teaching practices. In this context, a number of research studies have been undertaking in the Arab countries and Saudi Arabia. These studies were generally directed to understand further the reason for the discrepancy in the usage of IT by the educational institutions in developed nations and Arab countries.

2.4.1 Barrier to E-Learning in Saudi Arabia

Algahtani (2011) identified the important barriers to EL in Saudi Arabia's higher education, including: technical problems concerning difficulty of access, slow browsing (especially at peak times), lack of maintenance and viruses causing many problems, as well as the loss of data; these barriers could be as a result of aspects that are outside the university's control, such as: poor public networks or they could be due to the learners' limited skills in dealing with an EL environment. Some degree of risk could also be due to weak firewalls as well as additional problems associated with managing the actual information, in terms of not only accessing it, but extending the selection, obtaining what is needed, dealing with it and using it appropriately. This could be due to an abundance of information found by the learners and issues concerning their lack of clarity about mechanisms to critically evaluate the information they find.

In addition, Al Gamdi and Samarji (2014) identified a range of factors as barriers to adopting EL in the higher education sector in Saudi Arabia, these were classified as: internal barriers, external barriers and across internal barriers. Table 2.7 summarises the main barriers to adopting EL in Saudi Arabia's higher education sector.

Table 2.7: Groups of Perceived Barriers to Adopting E-Learning

Barriers	Classification	Items or Barriers Included in this Category
Internal Barriers	Sources	Care regarding the quality of e-courses, insufficient incentives to enjoy EL, self-intimidated by technology, absence of adequate proficiency of English and the absence of inspiring role models (Al Gamdi and Samarji, 2014).
External Barriers	Sources	Attention about student access, absence of training on EL, absence of good quality Internet and networking services in the university, avoidance of technical support in the university, improper design of instruction support for EL, absence of institutional policy for EL, improper availability and absence of hardware and software, concern regarding Internet theft and security issues on the Internet, and the absence of credit towards promotion (Al Gamdi and Samarji, 2014).
Across Internal Barriers	Internal and External Sources	Workload concerns and improper development of e-courses due to lack of time (Al Gamdi and Samarji, 2014).

Source: Al Gamdi and Samarji (2014)

2.4.2 E-Learning CSFs in Developing Countries

It is a major problem that, in developing countries such as Saudi Arabia, the student dropout rate and low success rates are very high (Kember, 2007). Hence, for the purpose of identifying some critical success factors (CSFs) of EL in developing countries, various research and studies have been performed aimed at improving graduation and success rates (Solomon et al., 2013).

It is worth noting that all countries invest a high amount of their total expenditure on the education sector; for instance, around 20% of the total expenditure in this sector is invested in the enhancement of the country's literacy rate. South Africa is among the countries which has high rates and fast growing public investment in their education sector, this equates to around 7% of their gross domestic product (GDP). In Saudi Arabia this resulted in an incremental rise of 6.2% which can be interpreted as about an

additional 55,000 students enrolling in colleges or universities between the years of 2010 and 2011. However, it should be noted that this does not mean that Saudi Arabia has very high rates in the education sector or that it has world class academic institutions that are at the cutting edge of technology, research and/or innovation.

E-learning simply means the implementation or delivery of education and knowledge electronically or by Internet enabled teaching and learning. Nowadays, the most important factor that a person should have is education as this will help to improve the standards of developing countries in the context of literacy which plays a very important role in the overall enhancement and development of a country. But, without learners, EL has no meaning. Moreover, the characteristics of the instructors are also a very important factor for making EL an effective and powerful system for fulfilling its overall aims. An EL environment provides the students with a learning approach to online resources, online curriculum and communication, tutor collaboration and assessments. In order to satisfy customers, the service quality should be high in order for the method to be truly influential. Furthermore, as a student adopts the EL method rather than the traditional method, the method or system should be very effective in order to provide successful outcomes to the students (Kember, 2007); for such results, infrastructure and system quality must play a very important role. The system design enables influential discussions, while also having impact on the organisational activities for the reduction of uncertainty, which will result in the correct and sufficient information. Moreover, the system's quality should be associated with the learner's or student's faith for all the characteristics of EL performance that can be evaluated by

functionality, ease of use, reliability, flexibility, data quality, portability, integration, as well as its overall importance. More specifically, well-designed courses, curriculums and learning materials make the EL system effective which will result in significant educational experiences. Information quality is defined as the accuracy, completeness, ease of understanding and relevance of the online course materials; this is measured in various terms, such as accuracy, timeliness, completeness, relevance and consistency. . Moreover, Bhuasiri et al. (2012); Punnoose (2012); Sun et al. (2008) have identified the CSFs of EL in developing countries as showing in the following Table 2.8.

Table 2.8: The CSFs of E-Learning System Adoption in Developing Countries

Dimension	Factor	Literature	Significant CSFs and their Function in Developing Countries	
Learners' Characteristics	Computer, own ability, Internet.	Arbaugh (2002); Chu and Chu (2010)	Perceived Usefulness	The person's positive perception and statement about the EL system would upgrade their learning performance.
Instructors' Characteristics	Own ability, opinion towards EL. Response at time, own ability, control on technology, emphasis on interaction, attitude toward students, unambiguous interactions.	Chiu and Wang (2008); Sun et al. (2008); Arbaugh (2002); Chiu et al. (2006); Liou et al. (2007); Lim et al. (2007); Sun et al. (2008); Webster and Hackley (1997)	Opinion toward EL	Apprehension of learners for participating in the EL activities through computer usage.
Institution and Quality of Services	Internet quality, programme flexibility.	Arbaugh (2000); Arbaugh and Duray (2002); Lee (2008)	Programme Flexibility	The impressive courses that facilitate students to complete their full degree programmes.

Infrastructure and System Quality	Computer training, reliability, ease of use, system functionality, system interactivity, system response.	Arbaugh (2000); Arbaugh and Duray (2002); Lee (2010); Lim et al. (2007); Pituch and Lee (2006); Roca and Gagné (2008); Sun et al. (2008); Webster and Hackley, (1997); Wu et al. (2010)	Computer Training	For the purpose of accomplishment in computers, the amount of specialised instruction and practice that is afforded to the learner to increase the learner's proficiency.
Course and Information Quality	Course quality, relevant content, course flexibility.	Arbaugh (2002); McKinney et al. (2002); Sun et al. (2008)	Course Quality	The quality of the content, writing, images, video, or flash, which has accepted standards of semantics, style, grammar and knowledge.
Extrinsic Motivation	Perceived usefulness, clear direction.	Arbaugh (2000); Law et al. (2010); Lee et al. (2005); Roca and Gagné (2008)	Computer Self-efficacy	The person's view point of their ability to use a computer for the completion of specific tasks.

Source: Bhuasiri et al. (2012); Punnoose (2012); Sun et al. (2008)

2.5 E-Leaning and Knowledge Management

2.5.1 Integration of KM and E-Learning Systems

In recent research, the concept of KM was introduced to EL systems; specifically, it was argued that EL systems could be facilitated through KM (Lam et al., 2013).

Both KM and EL share the same fundamental goal of facilitating organisational learning; as a result, researchers have tried to analyse the similarities in goals, methods of assessment and knowledge sharing of both EL and KM (Liebowitz and Frank, 2010). Certain characteristics were found between EL and KM by Pirmoradi et al. (2011), including: system architecture, collaboration and communication, personalisation of

delivered information and access rules. In order to improve the effectiveness of EL, the concept and methods of KM could be employed within it (Liebowitz and Frank, 2010).

The effectiveness of EL is highly dependent on the quality of the actual knowledge content, which in turn is highly dependent on the success of knowledge capture, storage and innovation. Knowledge management makes use of knowledge sharing and dissemination, consequently it is an important tool in building an organisation's assets as well as in improving the performance of the individual, group and the organisation (Lam et al., 2013). The concept of KM can be employed in EL to not only improve the effectiveness of EL but to also enhance the learning platform within an organisation. In combination, KM and EL focus on increasing the learning in an organisation.

2.5.2 The Differences and Similarities Between E-Learning and Knowledge Management

Interestingly, both EL and KM have a number of similarities and differences as they both use different approaches for different topics. The most noticeable difference, which is very important to identify, between EL and KM, is that they both focus on two individual and different goals (Chiazzese, 2005). A number of similarities and differences will now be presented by Yilmaz (2012) in Table 2.9.

Table 2.9: The Differences and Similarities between E-Learning and Knowledge Management

Differences		Similarities
E-Learning	**Knowledge Management**	
E-learning systems provide all the learning content related to a specific topic and e-communication facilities through the Internet and other sources that facilitates the learner to gain the required knowledge (Chiazzese, 2005).	Knowledge management systems provide knowledge to learners through the use of CMS, they utilise some facilities and enlist help from experts and other users on various topics (Bromage, 2010).	E-learning and KM systems have similarities in the context of education as they both provide knowledge to learners by their different means or methods (Bromage, 2010).
E-learning systems collect information about each learner in terms of monitoring their progress in tests and examinations; hence, these EL systems can provide information for enterprise and human resources systems.	Skills management can be regarded as a component of the KM system (Bromage, 2010).	An EL system's main aim or target is not only to provide the content for the purpose of teaching clients, but it also provides information in a sorted and structured context. Whereas, a KM system provides the content which may be used in an EL approach.

Source: Yilmaz (2012)

2.5.3 The Barriers of E-Learning and Knowledge Management in Developing Countries

2.5.3.1 E-Learning

In developing countries there are major issues, especially in rural areas, concerning the fact that the kind of facilities and systems needed for EL and KM systems are either

lacking somewhat or they may not even be in existence. As a result, in developing countries, many educational institutions and organisations are slow in adopting EL technologies (Becker, 2008). This is a major problem in the more rural areas of developing countries; hence it is very difficult to implement these concepts in such countries. Many researchers have focused their efforts on identifying the challenges that would be faced in attempting to adopt the above concepts, challenges include: the lack of ICT infrastructure (Altameem, 2013), the lack of awareness (Mikki and Jondi, 2010; Al-Khalifa, 2010), problems in access to the Internet, the lack of trust and security (Demiray, 2010), problems with quality assurance (Sun et al., 2008; Al-Khalifa, 2010), the lack of training (Cech and Bures, 2004; Marfo and Okine, 2010; Demiray, 2010) the lack of support and funding (Marfo and Okine, 2010; Al-Khalifa, 2010), problems with computer literacy (McVeigh, 2009; Al-Khalifa, 2010; Gulbahar and Tinmaz, 2006; Selim, 2007; Kahiigi et al., 2011), regulatory issues (Demiray, 2010; Deepwell, 2007), the lack of technical support (Marfo and Okine, 2010; Deepwell, 2007, Rajoo and Krishnan, 2013) and a general lack of strategy and frameworks (Mikki and Jondi, 2010; Al-Khalifa, 2010). All of these issues combine to makes it very difficult to implement EL across many educational institutions; a summary of these EL obstacles is presented below in Figure 2.2 (Altameem, 2013).

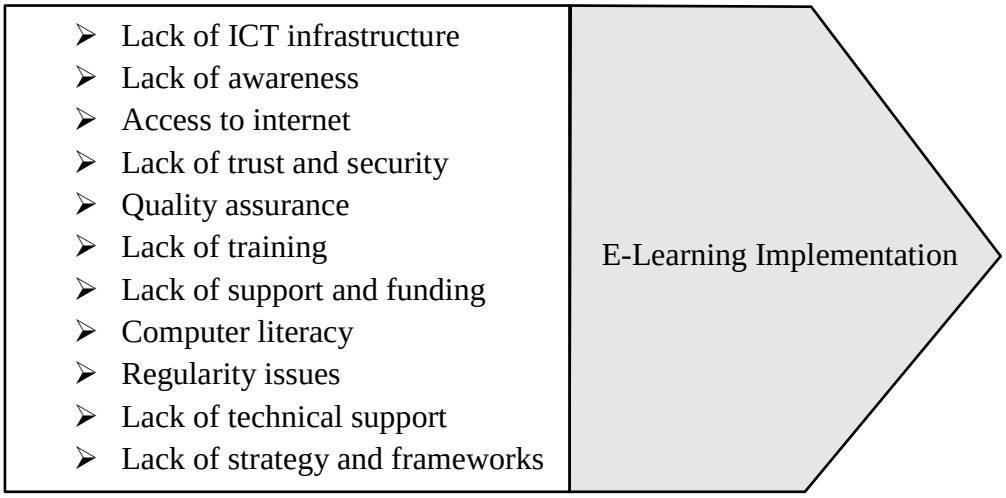


Figure 2.2: Challenges of E-Learning

Source: Altameem (2013)

2.5.3.2 Knowledge Management

The problems affecting the implementation of EL similarly affect the implementation of KM systems in developing countries (Becker, 2008). In such countries culture also acts as a barrier in preventing the communication and disclosure of knowledge. Mohamed et al. (2008) illustrated the major problems or reasons affecting KM systems in the Arab region; these problems were discussed in the United Nation's Development Programme Report (UNDP/RBAS/MBRF, 2009). The main reasons for KM deficiencies are due to:

- Differences in Arab cultures and other cultures across the globe.
- The rate of illiteracy among the population in this country is quite high.

Hutchings and Mohannak (2007) highlighted cultural differences that pertained to trust. According to them, within an Arab context, it was noticeable that the act of knowledge

sharing by managers was preferably with individuals with whom they had strong relations that were based on confidence and trust. Furthermore, Hutchings and Mohannak (2007) noted that the key issues recognised from the data collected by participates included:

- National culture being a potential barrier.
- An absence of commitment toward KM.
- Lack of job security, composition of a diverse workforce and the absence of team spirit.
- Issues associated with technology.

2.5.4 The Link Between E-Leaning and Knowledge Management (CSFs) in Developing Counties

The CSFs of EL and KM, and the effect of both factors on each other, can be classified from the literature review studies, these will be summarised in Table 2.10, below.

Table 2.10: CSFs of Knowledge Management and E-Learning in Developed Countries

KM (CSFs)	EL (CSFs)	The Relationship Between Factors	Literature
Top Management Support	Programme Flexibility	Three different aspects that are notable, include: funding support, technological support and experience support which incorporates the range for the top management support. A project is not possible, or going to happen, until the proper funding support is present. It was observed that during the initial stage of EL development, at the university, it was comparatively easy to obtain funds. However, the role of the top management was crucial in terms of technological support, as it is necessary to specifically allocate central IS resources in order to facilitate project	Lin et al. (2011)

KM (CSFs)	EL (CSFs)	The Relationship Between Factors	Literature
		implementation. The support can take shape in the EL platform and in the provision of tools. The top management therefore plays a key role in knowledge support, as well as their experience of various EL projects which can result in the creation and acquisition of knowledge. With rising understanding of EL by the top management, this can guide them to filter project proposals and identify strong potentials to invest in.	
Employee Empowerment	Computer Training	For the purpose of solving problems and decision support, there is a high usage of computer-based learning which leads to: 1. Greater employee flexibility, 2. A rising level of competencies. A greater level of work-related competencies is likely to result in higher employee flexibility. By the use of computer-based learning, employee autonomy in decision making is extended to a greater autonomy level as it offers the convenience to choose the place and time of learning, in a comfortable manner.	Siering and Pahlke (2013)
Organisational Learning	Attitude Towards EL	Different forms of teaching and learning cannot be replaced by EL, but it can: • Help to resolve many educational problems. • Be opportunistic enough to organise teaching and learning. • Save the time and effort of teachers as well as the students. • Increase access to education and training. • Increase the teaching efficiency. • Promotes collaborative learning. • Compares to other forms of learning as it can engage more learners. • Integrates all forms of media: print, audio, video, animation. • Increases the quality of the teaching. • Increases teaching and learning flexibility. • Improves interaction between students and teachers. • Enhances the pedagogic value of the course. It can be very effective, but the EL material should be essentially of a high quality.	Jan et al. (2012)
Organisational Culture	Computer Self-Efficacy	The following six elements positively influence computer self-efficacy in an organisational culture: • Team work • Climate of organisation and morale of employees	Sheng et al. (2004)

KM (CSFs)	EL (CSFs)	The Relationship Between Factors	Literature
		• Supervision • Flow of information • Involvement • Number of occurrence and productivity of meetings.	
Storage and Sharing the Knowledge	Perceived Usefulness (PU)	Positive outcomes are realised when the people who use the system, and their behavioural intentions, are positively affected by PU. This happens more when it is influenced by the attitudes of colleagues and/or senior management. Knowledge sharing was termed as valuable and beneficial to respondents and colleagues as it showed significant relevance of PU.	Bouma (2011); Ho (2010)
Continual Learning	Course Quality	Different categories of process learning can be polished by improving the quality of the EL course. The improvement areas include the relevance of the information, and: **The learning process:** 1. Course and curriculum. 2. Methods and ways of learning. **E-learning environment:** 1. Supporting and guiding learning. 2. Interface. **Personal experiences and initial competence of the learner:** 1. Proficiency and competence in foreign language. 2. Useful experience of EL in the past.	Volungeviciene et al. (2008)

2.6 Bloom's Taxonomy

2.6.1 History of Bloom's Taxonomy

A famous psychologist, Benjamin Bloom, and several of his colleagues were credited with the creation of Bloom's Taxonomy in 1948. Bloom's Taxonomy has undergone several changes, over the years, but it is still used in the educational sector today.

Originally, it was a method of student performance evaluation which provided a way of classifying educational goals. Its creators intended it to focus on three major domains of learning: cognitive, affective and psychomotor. According to Bloom, the cognitive domain is linked to a person's ability to recollect the knowledge as well as the development of intellectual abilities and skills. The affective domain, as explained by Bloom, is related to the development of appreciations which are adjusting as per the interest, attitudes and values of a person. Finally, the psychomotor domain is linked to a person's abilities in the motor-skill area (Lister, 2012).

Despite Bloom's Taxonomy initially being applied in these three domains, with time it has been restricted to the cognitive domain which relates to intellectual skills development. Bloom divided the development of the cognitive domain into the six categories of: knowledge, comprehension, application, analysis, synthesis and evaluation as expressed in Figure 2.3. These categories are part of the cognitive skills development of people, they were explained in terms of a step-by-step process which will now be expanded upon. The first step of knowledge includes memorising, repeating information and recollecting it. The second step of comprehension involves classifying, describing, discussing, identifying and explaining information. In the third step, the students are asked to demonstrate, interpret and solve problems based on the learning they have received. In the fourth step, the students are asked to compare, distinguish and examine the information they have received, with this, they get the chance to test the knowledge. Based on the knowledge they receive, the students are then encouraged in the fifth step to argue, defend and support their results in order to formulate results that

are based on a discussion. Lastly, the final step focuses on the evaluation category, whereby the students evaluate a project or learning aspect, if the results are not favourable then a new opinion will be formed (Lister, 2012).

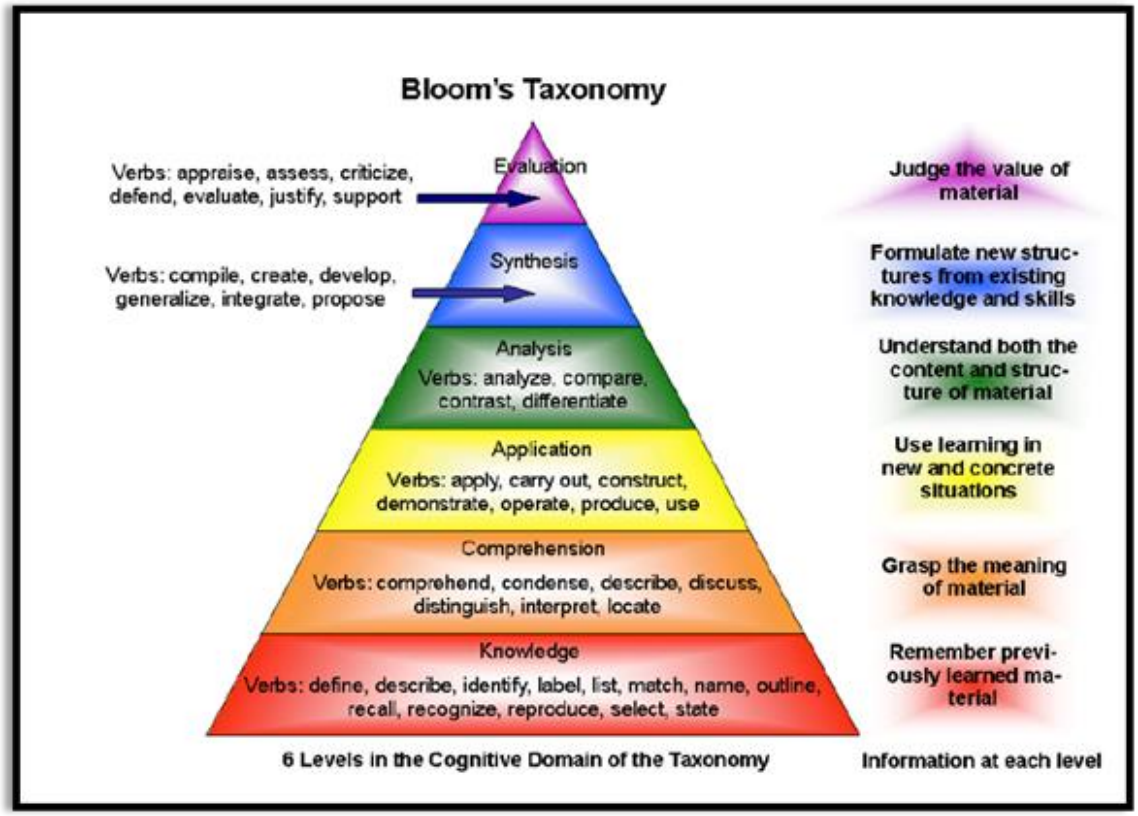


Figure 2.3: The Enhancement of Teaching and Learning

Source: (Lister, 2012).

2.6.2 Bloom's Revised Taxonomy

The Taxonomy was revised by one of Bloom's students, Anderson, (1990) altered the major cognitive process categories to signify actions. This change was implemented due to the implication that thinking involved active engagement. In comparison to the original, which listed knowledge as part of the taxonomy, the division of different types

of knowledge was made to include: factual, conceptual, procedural and metacognitive knowledge (Marzano and Kendall, 2007). In the Revised Taxonomy, the sequence of the stages also changed. The "evaluation" stage was moved below the "creating" stage, making the "creating" stage, the last step, see Figure 2.4.

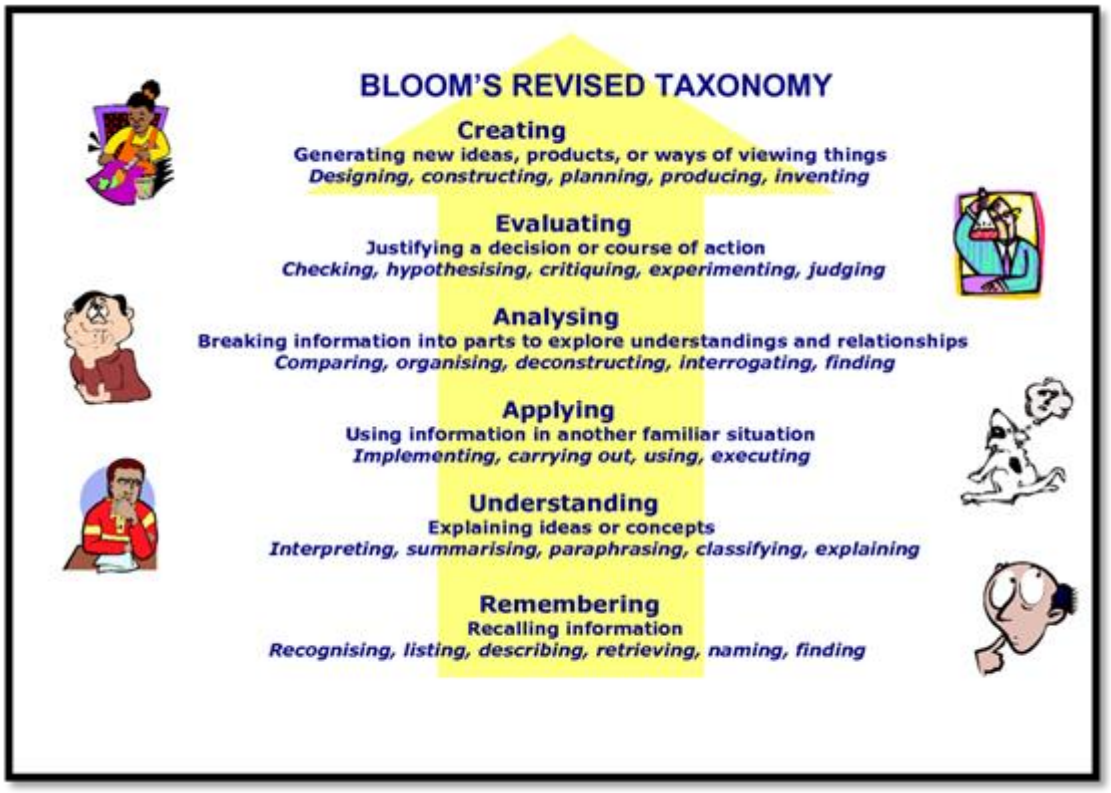


Figure 2.4: Revised Bloom's Taxonomy Action Verbs

Source: Anderson and Krathwohl (2001)

2.6.3 The Relationship Between the New Bloom's Taxonomy Framework (Learning Process) and KM and EL (CSFs)

Recent research reveals great interest in introducing Knowledge Management (KM) ideas to e-learning systems. It is argued that KM can facilitate an e-learning system

(Denning, 2000). The joint studies of KM and e-learning point out the same fundamental goal: facilitating organisational learning. Researchers try to analyse the similarity of the goals, methods of assessment and some knowledge-sharing processes in both of KM and e-learning. However, there is a clear lack of addressing how the integration between the two systems based on their CFs can bridge the gap in the education field.

This study attempt to explore the relationship between the New Bloom's Taxonomy Framework and EL/KM, various literature items will be summarised below in Table 2.11.

Table 2.11: Possible Links between KM and EL CSFs

Learning Process	
1. Creating (Top of Bloom's Taxonomy Pyramid)	
KM (CSFs)	**EL (CSFs)**
Top management and creating the knowledge Top management support is vital to the creation of knowledge in the employees. The top management in this regard needs to nurture and encourage the learning initiatives that are provided by the organisation, not only for the talented employees but all the employees in the organisation, across all levels. This would ultimately result in sharing the knowledge in the employees. The top management should initiate and motivate the sessions of learning that would ultimately benefit the employees and the organisation (McIntyre et al., 2014).	**"Programme flexibility" and creating the knowledge** In the global competitive world, business organisations realise that the vitality and profitability of their business is dependent on the ways in which they create flexible programmes for their employees. These programmes not only keep the employees committed and engaged in the organisational goals but they also enhance their knowledge. A strategic approach to programme flexibility is adopted by the organisation to create a successful transformation, enhancing the knowledge of the employees. The programme flexibility factors that need to be taken into account by the organisations include: a clear action plan, top management support, defined timelines and a person authorised to make these changes (Australian Government, 2000).
2. Evaluation	
Employee empowerment and evaluate the knowledge	**"Computer training" and evaluate the knowledge**

In the business organisations, the empowerment of the employees provides them opportunities for more autonomy and control to do their work, as well as solve the problems, which ultimately results in the evaluation of their knowledge. In order to evaluate the knowledge of the employees, the organisations formulate strategies that are aimed at increasing the decision making skills that affects their work, as well as providing them the opportunity to participate in the organisational policy making and thus, empowering them (Hardina, et al., 2006).	The computer training enables the learners and employees to increase their skills, motivation and productivity. It is also used to evaluate the knowledge of the learners. Employees who receive the computer training are able to add a competitive advantage to the firm. However, it depends on the resources and whether the organisation places emphasis on the factors of computer training to evaluate the knowledge of learners (Jia, 2012).
3. Analyse	
Organisational culture and analyse the knowledge The culture of the organisation is an important tool that affects the productivity of the employees and the organisation. The application of the KM in the organisation acts as a source of competitive advantage that transforms the employee knowledge and leads them to analyse their knowledge. Organisational culture analyses the knowledge of the employees as culture determines the basic values, beliefs and norms that employees develop (Rasula, Vuksic and Stemberger, 2012).	**"Computer self-efficacy" and analyse the knowledge** In the changing environment in the education system, the teachers are using ICT for teaching and administration purposes. The computer self-efficacy factors such as basic computer skills, media related skills and web-based skills lead to the analysis of the knowledge. Computer self-efficacy can be defined as the judgment of a person's ability to use the computer. A person's ability to use the computer-based technology affects their self-efficacy (Toe and Koh, 2010).
4. Applying	
Organisational learning and applying the knowledge Organisations are developing and creating useful knowledge to make it available to the staff so that they can use them when they need. This will result in the effective use that will ultimately influence the performance of the organisation. According to the researchers, the organisational learning is complementary to the KM that results in the application of the knowledge. Organisational learning is becoming one of the important ways to enhance the organisations' ability to improve continuously their knowledge utilisation (King, 2009).	**"Attitude towards e-learning" and apply the knowledge** In the contemporary environment, the attitude towards EL of the learners is associated with the use of telecommunication technology in the field of education and training to deliver the information. Globally, EL is seen as a tool that provides the learners with the ability to apply the knowledge and thus, enable them to learn anywhere at any time. The EL culture is developing, it goes beyond the classroom and has become essential for the application of knowledge and the future of higher education attainment (Aixia and Wang, 2011).
5. Understating	
Continual learning leads to understating the knowledge The learners should develop continuous interest to learn and seek the knowledge not just for the purpose of gaining immediate results but for the purpose of developing this as a lifelong habit. This not only results in enhancing the knowledge skills of the learners, but it also makes them	**"E-learning course quality" and understanding the knowledge** The social, economic and technological factors are the ones that are revolutionising the learning and teaching processes at universities, schools and organisations. Nowadays, the development of EL course quality factors are contributing to the openness of learners towards the wider

understand the knowledge by the way of continuous learning. The learners are not only able to learn but they also develop new interests, gain new competencies and acquire useful skills (Maehr, 2012).	community, especially regarding higher education, with the growing needs and demands of learners. All these factors are contributing to the understanding of the knowledge by the learners. The need for learning by the learners comprises of quality criteria of any kind of EL course that leads to the understanding of knowledge (Volungeviciene, Zuzeviciute and Butrime, 2008).
6. Remembering	
Storage and sharing the knowledge leads to remembering the knowledge Knowledge sharing in the business organisation is a part of daily routine and a step towards the KM lifecycle. Knowledge transfer takes place from teams to individuals and also between individuals. This storage and sharing of the knowledge ultimately results in the remembrance of the knowledge among the employees in the organisation. The storage and sharing of knowledge takes place with the help of the technologies that exist in the organisation (Bryson et al., 2014).	**"Perceived usefulness" and remembering the knowledge** According to Scheg (2014), for distance EL courses one of the main requirements is active learning. The principle on which the active learning is based is that the students in this process should actively participate in the learning process, rather than by simply reading books or listening to lectures. The EL is beneficial as long as it has PU, efficacy and compatibility that leads the learners to remember the knowledge (Scheg, 2014).

Source: Compiled by the researcher

From the above compilation, the following Figure 2.5 presents a summary of the relations between EL/KM and Bloom's Taxonomy Framework.

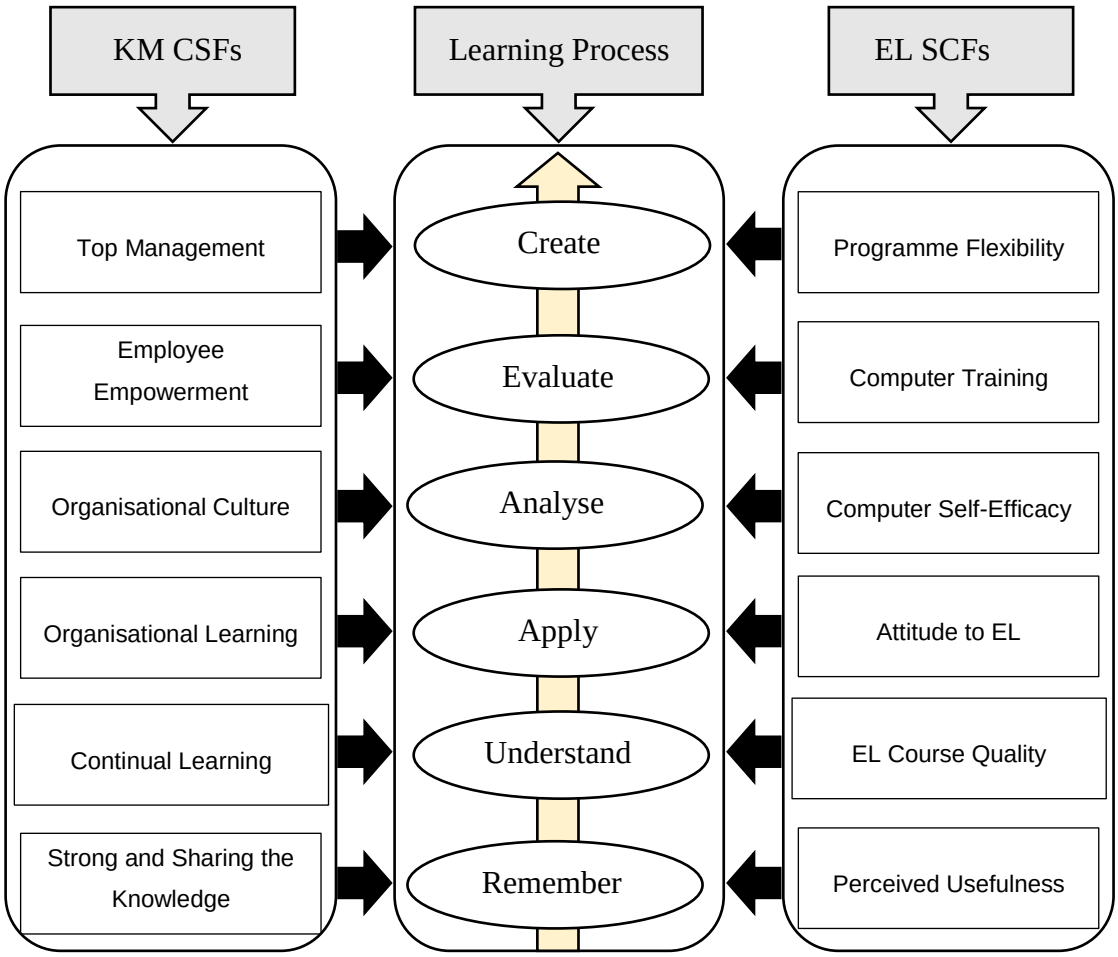


Figure 2.5: The Relations Between EL/KM and Bloom's Taxonomy Framework

2.7 Education in Saudi Arabia

This section will focus on the structure of the public and higher education sector in Saudi Arabia. When the Kingdom of Saudi Arabia was formed, the education sector of the country consisted of five schools, which started the modern educational movement. The foundation of the Directorate of Public Education in 1925 was the first attempt to organise the educational sector of the country (Schlesinger and Persky, 2015); however,

it took a further four years for the first education policy to be formed in 1929 – this was an amendment of the original system for schooling. A huge gap existed between the formulation of the first and second education policies; to illustrate, the second educational policy was not formulated until 1970, this policy was more thorough though and included 9 sections and 236 items. As the society of Saudi Arabia is highly dependent on Islamic principles, the education policy was also inclined towards the teachings of Islam; specifically, the education policy was developed in such a way as to contribute to the development of society as per the provisions of Islam. The main aspect is that the government of Saudi Arabia made provisions for free education to be provided to all (Schlesinger and Persky, 2015). The public education system was divided into three sections, namely primary, intermediate and secondary schooling, which totalled 12 years of schooling. The secondary level of school learning consists of three important subjects, Islamic studies, science and administrative studies.

In terms of statistics for the educational sector, in 2009, there were more than five million students, taught by 468 thousand teachers in around 33.5 thousand schools. Among the five million students, the male students consisted of around two and a half million, they were taught in more than 15 thousand schools by over 217 thousand teachers, the remainder were female students that were taught by over 250 thousand teachers in more than 18 thousand schools. In modern times, the educational system of Saudi Arabia has placed a greater emphasis on scientific developments and steps have been taken by the Ministry of Education to encourage EL among students with the help of various programmes. For this purpose, the government has also converted numerous

libraries to online facilities so that information is available to all students via the Internet. The adoption rate of EL techniques has increased to a great extent in Saudi Arabia's educational sector.

2.7.1 Higher Education in Saudi Arabia

The purpose of creating the Ministry of Education in Saudi Arabia was to manage and organise the higher education sector and implement the educational policy, according to the changing needs (at the time) of the Saudi students. Higher education in Saudi Arabia places emphasis on the principles of Islam (Zheng et al., 2008). However, according to the changing needs of society, the Ministry of Education has made an amendment to also included science and technology as subjects to be taught to the students in higher education. This has helped to enrich the quality of education by adding innovation and scientific knowledge to the school curriculum; this has also encouraged the provision of solutions to various problems, with the help of advanced technology. The educational policy also places emphasis on the work quality of people, by imparting training to the working graduates (Zheng et al., 2008). Since the first university, the King Saud University, was opened in 1957, numerous new universities have been established over the years, and in 2009 the total number of universities operating in Saudi Arabia was 20. Official figures of the Ministry of Education state that there are currently 23 public universities and 220 colleges operating in Saudi Arabia (Table 2.12). These universities cater to around 702 thousand students and employ around 30 thousand faculty members.

Table 2.12: The Names of Public Universities and the Dates They Were Founded

University	Founded	City	Website
King Saud University	1957	Riyadh	www.ksu.edu.sa
Islamic University of Madinah	1961	Madinah	www.iu.edu.sa
King Abdulaziz University	1967	Jeddah	www.kau.edu.sa
Imam University	1974	Riyadh	www.imamu.edu.sa
King Fahad University	1975	Dahran	www.kfupm.edu.sa
King Faisal University	1975	Hasa	www.kfu.edu.sa
Umm AlQura University	1979	Makkah	www.uqu.edu.sa
King Khalid University	1998	Abha	www.kku.edu.sa
Taif University	2004	Taif	www.tu.edu.sa
Taibah University	2005	Madinah	www.iu.edu.sa
Qassim University	2005	Qassim	www.qu.edu.sa
Jouf University	2005	Jouf	www.ju.edu.sa
Jazan University	2005	Jazan	www.jasanu.edu.sa
University of King Saud for Health	2005	Riyadh	www.ksauhs.edu.sa
University of Hail	2006	Hail	www.uoh.edu.sa
Al-Baha University	2006	AL-baha	www.bu.edu.sa
Najran University	2006	Najran	www.nu.edu.sa
Tabuk University	2006	Tabuk	www.ut.edu.sa
Alhudod Alshamalia University	2007	Arar	www.nbu.edu.sa
Dammam University	2009	Dammam	
Al-Kharj University	2009	Al-Kharj	
Al-Mujma University	2009	Al-Mujma	
Sugra University	2009	Sugra	

Source: Algahtani (2011)

2.7.2 Strategies of "Implementation Plan" in Saudi Higher Education

The following points are considered within the Saudi Education Strategy:

- Assigning students to collect data on scientific articles and discussions.
- Applying cooperative education in teaching and decision making.
- Using lectures and discussions as teaching methods and in solving problems.

- Making use of models and discussions in teaching practices.
- Using modern educational techniques in discussions.
- Criticising teaching methods of writing reports, discussions and short research, used in secondary schools.
- Discussions of problems arising in teaching Arabic language branches, such as integrative and functional direction and selective trends.
- Discussions of the reasons for low levels of female students in the Arabic language.

The motives behind developing the various teaching strategies in Saudi Arabia's education system can be summarised as:

1. The objective behind the educational policy in the Kingdom is to make use of as many teaching methods as are necessary to develop the level of thinking in the students.
2. The dictions used by the teachers depend upon their reputation and conservations.
3. Certain strategies and tactics were found, which would motivate students to learn and long for the course and it would also promote membership for schools. Moreover, it was made sure that the students develop the concept of self-learning.
4. The teachers should possess good knowledge about the teaching strategies so that the students take an active part in the educational process.
5. The students should have the feeling of team spirit and collaborative work.
6. It was difficult to increase the guidance and follow up processes for the students, using the traditional methods.

7. The supervisors need to be trained to develop teaching strategies and methods so that they could impart better learning to the students.
8. Ultimately, the aim is to develop diverse methods and modalities used in education along with certain teaching principles.

2.7.3 Learning Strategies used in Saudi Higher Education

When a teacher moves into a classroom in a highly orderly and sequential manner, they aim to achieve the objective of teaching. The teacher's main focus is to train students to process and retrieve information, while also developing the tendency of independent and logical sound thinking in the students. Their main focus is to understand and develop skills in the students, so that they become a landmark of learning. In addition to this, educating students and developing multiple teaching strategies to ensure that the students are able to understand and assimilate the skills of synthesis, reasoning, problem solving, decision making and thinking, while also developing critical thinking are clearly emphasised (Smith and Abouammoh, 2013).

The diagram below, in Figure 2.6, shows the new outline of strategies of higher education in Saudi Arabia; as this is presented in Arabic, a translated version of this strategy is provided in Figure 2.7.

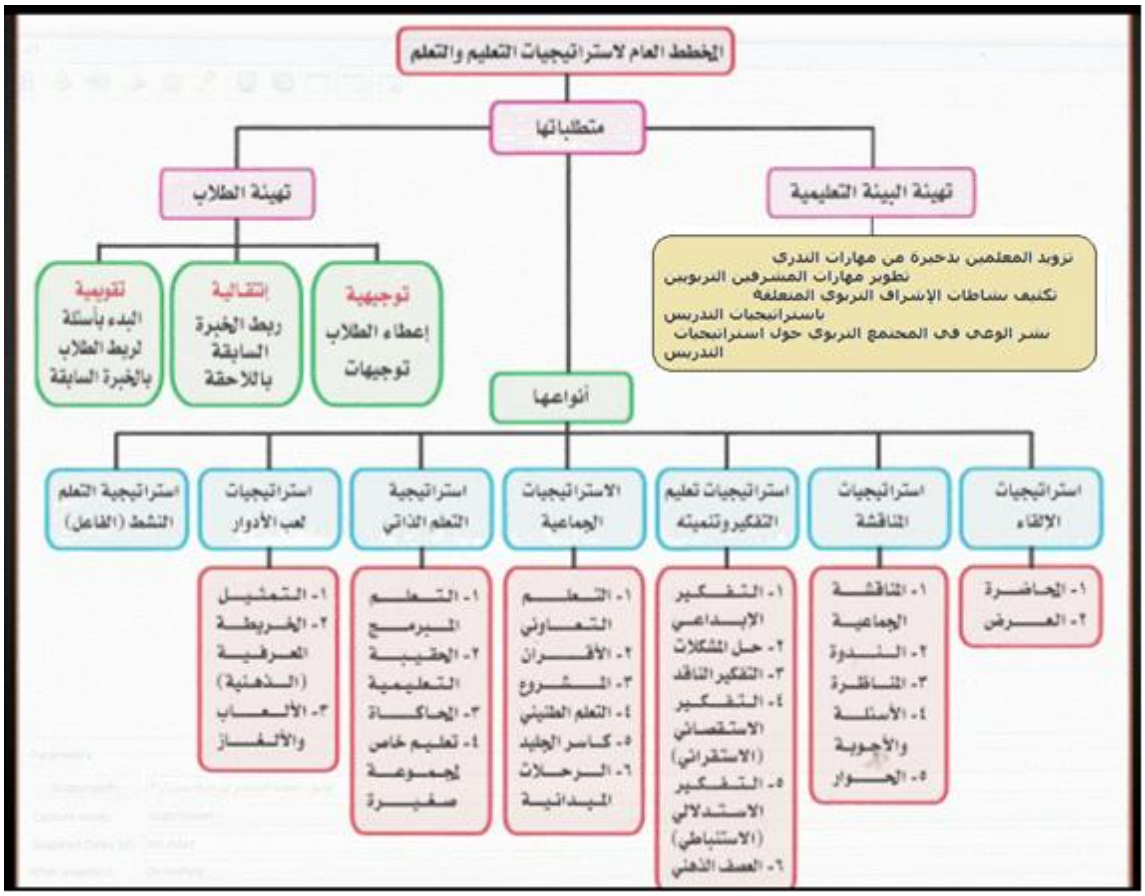


Figure 2.6: Outline of Strategies of Higher Education in the KSA (In Arabic)

Source: Al-Seghayer (2014)

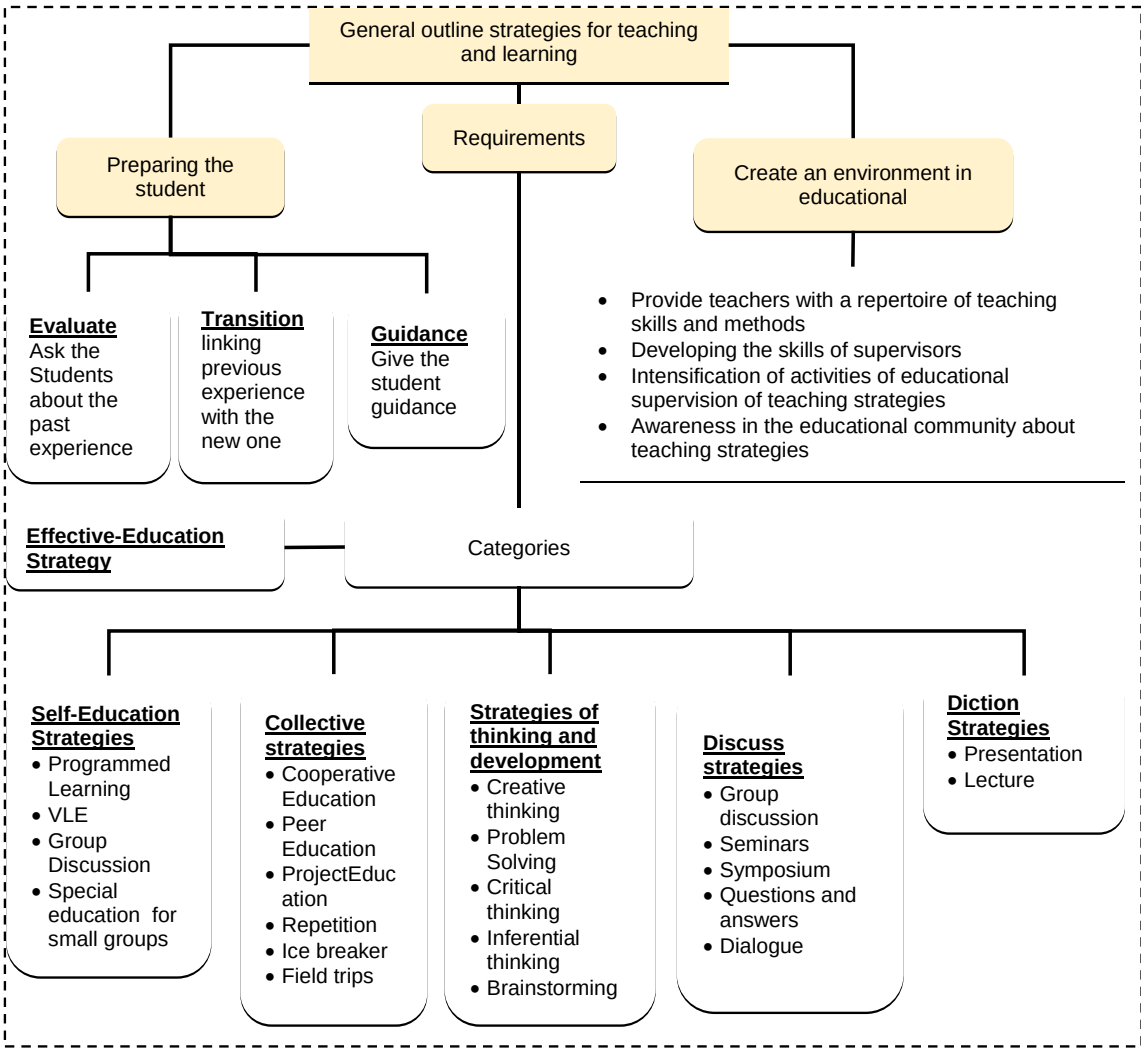


Figure 2.7: Outline of Strategies of Higher Education in the KSA (In English)

Source: Transcribed from Al-Seghayer (2014)

2.7.4 Learning Barrier in Saudi Education

Several challenging factors were found in developing countries, including Saudi Arabia, as noted by Moussa and Moussa (2009). Some of these challenges are summarised as follows:

- Learners can memorise the information more quickly than they can think about it and because the thinking and analysing technique to deliver new knowledge is absent the memorised information may also be lost.
- Lack of interactive education, cooperative thinking and team work.
- In the teaching process quantity learning is given more importance than quality learning.
- The concept of EL is not highly appreciated by both teachers and students and users are not encouraged to adapt to the modern techniques of learning.

While applying the new technology, the educators and learners should be seen as the key elements in the creation of EL knowledge and exchange process (Pachler and Daly. 2011).

In addition, the literature review also identified that there are several factors lacking support in the structure of higher education in Saudi Arabia; in short new programmes should embed the following condensed aspects within them:

- The flexibility of the programme;
- A clear approach towards EL;
- Empowerment of the employees.

2.8 Summary

This chapter has focused on various factors of both the KM and EL systems, these factors have been linked to the New Bloom's Taxonomy Framework in terms of the relationship between Bloom's Taxonomy (and the learning process – LOs) and KM. Moreover, the integration of EL and KM CSFs was also reviewed to identify whether these concepts (with New Bloom's Taxonomy Framework) had any influence in Saudi Arabia's higher education. Figure 2.8 below shows that the New Bloom's Taxonomy Framework, when integrated with EL and KM CSFs, can positively influence the higher education sector in Saudi Arabia.

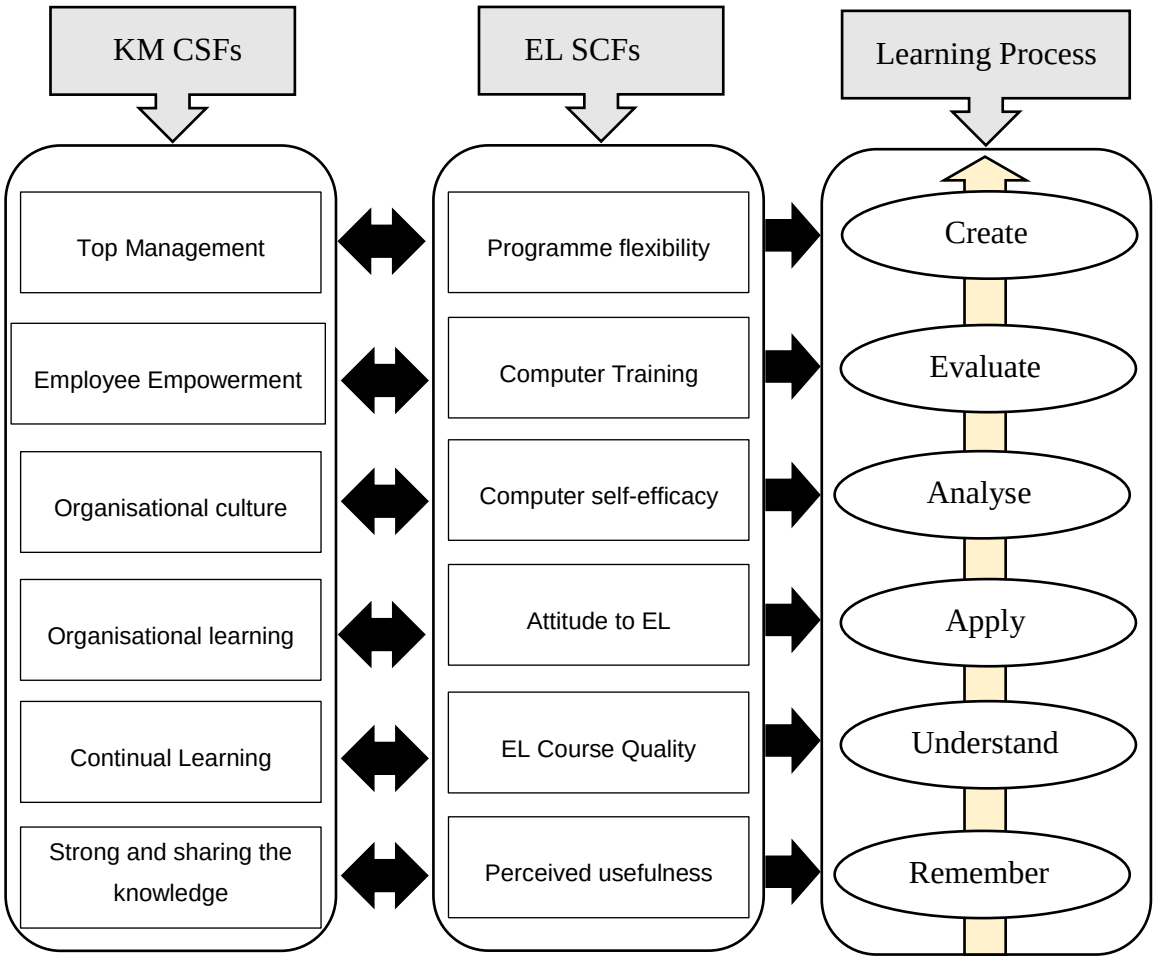


Figure 2.8: The Integration of EL and KM CSFs Positively Influence Saudi Arabia's Higher Education Sectors Under the New Bloom's Taxonomy

Chapter 3: Research Design and Methodology

This research methodology chapter will focus on the strategy and design that have been selected for the conduction of this research project. A framework will be provided to define the flow and direction that this research will follow. The researcher should adopt a strategy that best suits the required collection of data from the various data sources; as a result, various factors should be considered, including the research topic. It is imperative that the most suitable research methodology is selected to ensure the relevant research outcomes are fully explored (Gliner, Morgan and Leech, 2009). This selection also plays a significant role in validating the findings of the research, and meeting the main research objectives. Research methods consist of various procedures and data analysis methods for the specific data collection, these aspects will be discussed thoroughly in this chapter.

3.1 Quantitative Research Methods

When a quantitative research methodology is adopted for data collection, this facilitates the researcher to collect the views and opinions of people by conducting a survey with the help of a questionnaire. The people or participants that are approached for the purpose of the survey are considered to be the sample population. The methods that are adopted under this technique help in establishing a relationship between various

research variables that are well aligned with the research question(s) (Goddard and Melville, 2004). Quantitative methods also help in generalising the outcomes of research by obtaining bias-free answers regarding the possible changes that are specific to the results. The quantitative method focuses on the research variables, the analysis of the facts associated with the objectives, and reliability (Frederick, 2005). There are two reasons why the quantitative research approach was adopted. Firstly, it is considered to be a good approach to establish a link between the research theories and the social realities and viewpoints of the participants. Secondly, it is also suitable for becoming familiar with the factors affecting employee behaviours and the way these factors influence the behaviour of an employee. The quantitative research method also provides a descriptive explanation of the social action and the relationship of the specific events in terms of any causal relationships (Ebrahim and Bowling, 2005).

There are many strengths and weaknesses associated with all research methodologies, a summary of the strengths and weaknesses associated with a quantitative analysis are presented below in Table 3.1.

Table 3.1: Quantitative Data Analysis: Strengths and Weaknesses

Strengths	Weakness
1. Helps in ensuring accuracy. 2. Helps in obtaining the result and features, which are more focused. 3. Helps in generalising the findings with respect to larger populations. 4. Facilitates accurate presentations with the help of graphs and pie charts. 5. Marginal errors are considered and missing values are calculated.	1. Consumes more time than the qualtitative analysis. 2. The cost factor can pose a problem. 3. Difficulties can be encountered during the implementation. 4. Computer analysis needs to be undertaken.

3.2 Research Design

One of the most critical tasks in carrying out a research study is in the selection of a suitable research design. The research design plays a significant role in defining the reason and purpose of the research, along with a proper direction to guide the work (Cryer, 2006). It also helps the researcher to undertake certain decisions to ensure that they are well aligned with the research aims. A major aspect of the selection of a research design is the researcher's anticipation of the research decisions.

3.2.1 Pilot Testing

Pilot tests are a crucial and intensive requirement of such a large sized project. According to De Vaus (1996), it is wise to assess the reliability and validity of indicators before conducting the actual survey with the whole sample.

In line with this, the pilot test was conducted with a small sample of 30 people, all of which were randomly selected. The participants included experts in the EL and KM fields, consequently they were selected because they were specialists in the two systems; it was felt that this would help to provide a diverse range of information from their different specialised experiences. The findings from the pilot test would allow the researcher to identify the difference and similarities in the information obtained, it was hoped that this would provide direction and focus on the best survey procedure that would be used in this research.

After obtaining feedback from the pilot study's participants, the overall response was that the questionnaire was straightforward and easy to complete.

3.2.2 Questionnaire

The conduction of a survey with the help of a questionnaire is deemed to be a suitable approach for obtaining valid and authentic information relating to set research problems. It is a commonly used method among researchers as it is cost effective and helps in the gathering of data from a large number of people; ultimately, it obtains their viewpoints (Creswell, 2003). With the help of this method, a critical evaluation of the behaviour and attitudes of the target population could be performed to obtain a deep insight into their understanding. The reason that this method is highly preferred by researchers is because it helps to obtain generalisable data; it also provides the respondents with freedom to put forward their beliefs and views.

As this research aims to collect a large knowledge base, it was necessary to provide clear instructions in the questionnaire to prevent the respondents from becoming confused. Prior consent of the respondents was taken before conducting the survey to ensure their voluntary participation. They were also given the freedom to withdraw from the process at any given time. To help to effectively guide the respondents to the various questions in the questionnaire, each section was enclosed with a suitable title to provide insight to the content within. In this context, close-ended questions were included so that the respondents were provided with various options or alternatives from which they could choose a suitable answer (Collins, 2010). This approach helps in obtaining

standardised answers, which can further be decoded and analysed critically to ensure uniformity in the answers. The questions will help to gain detailed insight into the perception of people regarding the impact of EL factors and KM on the New Bloom's Taxonomy Framework. An online questionnaire will be conducted as this will increase familiarity with the various factors affecting the integration of New Bloom's Taxonomy theory into the learning practice. Reliability in Quantitative Research

Many different research studies have contributed to the establishment of various statistical tools for the measurement of reliability in research studies. It is necessary that the results obtained through a research tool should be the same irrespective of the person (inter-rater reliability) who is using it, or the time at which it is being used (test-retest reliability) (Burns, 2007). It is highly essential to firstly examine the internal consistency of the tools used in the research. Internal consistency refers to the link that is formed between the results of a particular survey or test. For example, if a survey is conducted to identify the views of the people regarding job satisfaction, then internal consistency is the relation between the answers given by a single respondent in the context of a particular questionnaire.

The answers given by the respondents are assessed on the basis of their consistency and the degree to which they are aligned with each other. Cronbach's alpha coefficient and other similar statistical procedures are applied to measure internal consistency in the answers provided by the respondents. For this measurement, the responses of the respondents are divided into two sets, the score of these sets are then calculated

individually. In the end, the relationship between the sets is assessed in order to measure internal consistency. This method is also known as the split-half test (Blaxter, Hughes and Tight, 2006); in such a case, the responses are segregated into more than one pair and in the end, an average correlation is obtained.

The approach of Cronbach's alpha takes into consideration the estimated result of all the halves, then an average score of the total individual scores are calculated to determine the reliability. The term reliability refers to the related proportionate variability in the context of a measured score, which is gained as a result of variability observed in the actual score (variability is not necessarily an error).

If a reliability of 0.9 is achieved, it means that in the context of the score, 90% is reliable with a 10% error variability being present in the score. A reliability value of between 80 and 90% is acceptable when conducting a research study (Babbie, 2010). In spite of all these advantages, a few limitations concerning the measurement of reliability can sometimes be associated with research studies.

3.3 Validity in the Quantitative Research

The task of testing the validity of the research refers to measuring the degree up to which a concept is valid against the alleged measures. There are two basic criteria, known as internal and external, according to which the validity of a research study is measured. In terms of external validity, it is possible to apply the findings obtained in a particular research study in a particular situation and on other people, provided that the

conditions of the research are similar to that of the situation to which it is being applied (Goddard and Melville, 2004).

The sample population targeted for the research study must comply well with the research variables, such as age and gender factors. Conversely, internal validity helps in carving out the reasons for the findings and outcomes obtained in the context of a particular research study. It also helps in unfolding the unforeseen reasons for the generation of the research outcomes. Three approaches are widely used for measuring the internal validity of a research study, including construct validity, criterion-related validity and content validity (Ebrahim and Bowling, 2005). The value gained by adopted the content validity is the least accurate in terms of the representativeness and relevance of the various research aspects, such as the questions included in the questionnaire.

This factor is given much importance in cases where the knowledge of the respondent is to be discovered with respect to a particular area or field. In this case, conducting a pilot study usually proves to be a beneficial task as it includes respondents who are similar to the target population. The validity of findings and data can also be ensured with the help of the literature and scholarly articles that have been published regarding a similar topic. The concept of criterion-related validity is a more accurate way of measuring the validity of the research study as it allows a comparison of the outcomes of various validation tools (Creswell, 2003).

However, in the absence of any validated measures that are similar in nature, this method cannot be applied. The adoption of construct validity is therefore ensured when

the concepts of the study and their inter-relation can be explained and proved with the help of a similar or related theory. In this context, the example of antibiotics can be considered, which consists of various other salts and drugs that have distinct features and roles; however, they are all related as they combine to fulfil the common purpose of curing a bacterial infection.

3.4 Summary

The above discussion has considered the most suitable methodological approaches with regards to the context of this research study. By considering various factors, it has been established that the quantitative research approach is the best fit for this research study, this will be in the form of a questionnaire survey. The advantages and disadvantages associated with the various research approaches have been discussed, as has the role and significance of research validity and reliability which have both been examined in detail.

Chapter 4: The DEMATEL Method

4.1 Introduction

This chapter will focus on the relationship between EL and KM factors, based on the New Bloom's Taxonomy Framework (learning process) by applying the Decision Making Trial and Evaluation Laboratory (DEMATEL) method. Based on the literature, six main levels of learning process and 12 factors from both EL and KM were extracted and validated by 30 experts from the UK. A questionnaire was constructed and responses from the experts were collected using 36 questions. The DEMATEL method is used to analyse the importance of the factors and the causal relations among the factors. The result showed that the "*remember*" factor is the most significant factor that influences the remaining five perspective levels.

4.2 Introduction to the DEMATEL Method

The DEMATEL method was developed between 1972 and 1979, it aimed to critically examine a closely related problematic group.

The DEMATEL method has been identified by many as the best tool available to identify the cause and effect relationship among the criteria of evaluation (Chiu et al., 2006; Liou et al., 2007; Tzeng et al., 2007; Wu and Lee, 2007; Lin and Tzeng, 2009). In order to identify the interrelationship between the factors, or to examine and create the

cause and effect relationship among the criteria of evaluation, the DEMATEL method is used (Yang et al., 2008; Lin and Tzeng, 2009). According to the findings of Yu and Tseng (2006), Liou et al. (2007), Tzeng et al. (2007), Yang et al. (2008), Wu and Lee (2007) and Shieh et al. (2010), the following diagram, presented in Figure 4.1, shows the step-by-step process followed by the DEMATEL method.

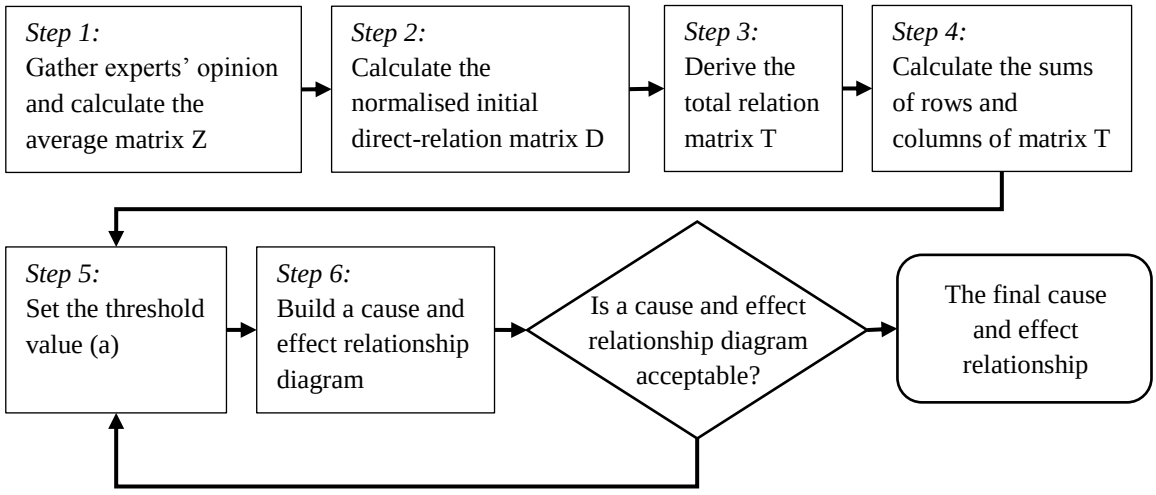


Figure 4.1: The Process of the DEMATEL Method

Source: Sumrit and Anuntavoranich (2013)

Step 1: Gather experts' opinions and calculate the average matrix *Z*

For this first step, an expert group (*m*) and the factors (*n*) are used. On the basis of pair-wise comparison, the two factors are studied and their degree of direct influence is reviewed by every expert. The expert denoted x_{ij} as the degree of the effect of the identified factor *i* on factor *j*. The score of the integer is divided on the respective scales of 0 (no influence), 1 (low influence), 2 (medium influence), 3 (high influence) and 4 (very high influence), respectively. For each expert, an *n x n* non-negative matrix is

constructed as $X^k = x_{ij}^k$ where *k* is the expert number participating in the evaluation process with $1 \leq k \leq m$. Thus, $X^1, X^2, X^3, \ldots, X^m$ are the matrices from *m* experts to aggregate all judgments from *m* experts, the average matrix $Z = [Z_{ij}]$ is shown below.

$$Z_{ij} = \frac{1}{m}\sum_{i=1}^{m} x_{ij}^k \quad (1)$$

Step 2: Calculate the normalised initial direct-relation matrix *D*

The worth of each element in matrix *D* is placed between [0, 1] and the normalised initial direct-relation matrix *D* is denoted as d_{ij}. The calculations for the same are presented below.

$$D = \lambda \times Z \quad (2)$$

$$[d_{ij}]_{nxn} = \lambda [Z_{ij}]_{nxn} \quad (3)$$

$$\lambda = Min\left[\frac{1}{\max 1 \leq i \leq n \sum_{j=1}^{n} |Z_{ij}|}, \frac{1}{\max 1 \leq i \leq n \sum_{i=1}^{n} |Z_{ij}|}\right] \quad (4)$$

According to Markov's Chain Theory, D^m is represented as the powers of matrix *D*, e.g. D_2, $D_3 \ldots D_\infty$ confirms the solutions that are convergent to the matrix inversions and are given below.

Step 3: Derive the total relation matrix *T*

Equation (7) is used for the calculation and identification of the total impact matrix (*T*), where *i* represents the *n*n* identity matrix. The indirect impact that factor *i* (EL CSF)

had on factor j (KM) is denoted by the element of t_{ij}. The whole relationship between every single pair of system factors is shown in matrix T.

$$T = \lim_{m\to\infty}(D + D^2 + \cdots + D^m) \quad (6)$$

$$= \sum_{i=1}^{\infty} D^i$$

$$\sum_{i=1}^{m} D^i = D^1 + D^2 + \cdots + D^m$$

$$= D(I + D^1 + D^2 + \cdots + D^{m-1})$$

$$= D(I - D)^{-1}(I - D)(I + D^1 + D^2 + \cdots + D^{m-1})$$

$$= D(I - D)^{-1}(I - D^m)$$

$$T = D(I - D)^{-1} \quad (7)$$

Step 4: Calculate the sums of rows and columns of matrix *T*

Vectors r and c are used in order to depict the sum of rows and columns in the total impact matrix (T).

$$r = [r_i]_{nx1} = \left(\sum_{j=1}^{n} t_{ij}\right)_{nx1} \quad (8)$$

$$c = \left[c_j\right]'_{1xn} = \left[\sum_{j=1}^{n} t_{ij}\right]'_{1xn} \quad (9)$$

Where $\left[c_j\right]'$ is denoted as the transposition matrix.

In matrix *T*, assume r_i to be the sum of the i^{th} row. The value of r_i represents the total obtained by both direct and indirect impacts that factor *i* (EL CSF) has on several other factors.

In matrix *T*, assume $^{C}_{j}$ to be the total of the j^{th} column. The value of *cj* depicts the sum obtained by both direct and indirect impact that several other factors have on factor *j* (KM CSF). If $j = i$, the value of $r_i + c_i$ showcased the total impact both supplied and obtained by factor *i*. Contradictory to this, the value represents the net contribution by factor *i* on the system. In addition, factor *i* (EL CSF) was found to be the net cause when $r_i - c_i$ was positive. Furthermore, when $r_i - c_i$ was negative, so factor *i* is effect (EL CSF) (Tzeng et al., 2007; Liou et al., 2007; Yang et al., 2008; Lee et al., 2009).

Step 5: Set a threshold value (α)

As calculated by equation (10), the calculation of elemental average was done in matrix *T* to derive the threshold value of α. The focus for this calculation was on the elimination of a few minor effecting elements in the *T* matrix (Yang et al., 2008).

$$\propto = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}[t_{ij}]}{N} \qquad (10)$$

Here, the total elements are denoted by *N* in matrix *T*.

Step 6: Build a cause and effect relationship diagram

The coordinate sets of $r_i + c_i$, $r_i - c_i$ are mapped together for creating a cause and effect diagram, which helps in identifying the critical relationship and facilitating information

useful for deciding the most significant factors and the way the impact itself affects the factors (Shieh et al., 2010). In a cause and effect diagram, the factors are shown to imply t_{ij} is greater than α (Yang et al., 2008).

4.3 Data Analysis

The DEMATEL method was applied on the six (learning process) levels where x^K shows the data gathered in terms of the six perspectives of expert *k*, where $x^K = [x_{ij}^K]$. The step-by-step procedures of applying the DEMATEL method are shown below in which a1–a6 from KM factors are linked to their counterparts of b1–b6 from EL factors.

Table 4.1: Knowledge Management Factors

a1	Storage and sharing the knowledge
a2	Continual learning
a3	Organisational learning
a4	Organisational culture
a5	Employee empowerment
a6	Top management

Table 4.2: E-Learning Factors

b1	Perceived usefulness
b2	E-learning course quality
b3	Attitude towards e-learning
b4	Computer self-efficacy
b5	Computer training
b6	Programme flexibility

The results for the computation of the average matrix Z (presented in Table 4.3) were constructed using Eq. (1):

$$m = 30, Z = {sum(cell)}/{m}$$

Table 4.3: The Results for the Computation of the Average Matrix *Z*

		a1	a2	a3	a4	a5	a6
X1	**b1**	0	3	3	3	3	4
	b2	2	0	3	3	2	2
	b3	1	1	0	2	1	1
	b4	1	3	3	0	1	3
	b5	2	1	2	3	0	3
	b6	1	2	2	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X2	**b1**	0	2	3	3	2	4
	b2	2	0	3	3	3	3
	b3	1	2	0	2	2	0
	b4	2	4	1	0	2	2
	b5	1	2	2	1	0	3
	b6	2	1	2	3	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X3	**b1**	0	3	2	2	3	4
	b2	2	0	2	3	3	0
	b3	1	3	0	1	2	1
	b4	2	3	2	0	3	1
	b5	1	2	2	2	0	4
	b6	1	2	1	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**

X4	**b1**	0	2	2	3	3	3
	b2	1	0	3	3	3	3
	b3	1	2	0	0	2	2
	b4	1	3	2	0	2	2
	b5	2	2	1	3	0	3
	b6	2	1	2	2	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X5	**b1**	0	2	2	0	2	3
	b2	2	0	2	3	2	2
	b3	1	2	0	2	1	1
	b4	2	3	1	0	3	2
	b5	2	1	2	2	0	3
	b6	2	1	2	2	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X6	**b1**	0	2	2	3	2	4
	b2	2	0	2	3	3	3
	b3	1	2	0	2	2	1
	b4	2	3	2	0	0	1
	b5	2	2	2	3	0	2
	b6	1	2	2	2	1	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X7	**b1**	0	2	3	2	2	3
	b2	2	0	3	3	2	0
	b3	2	3	0	2	3	2
	b4	1	4	2	0	2	1
	b5	2	1	2	2	0	3
	b6	2	1	1	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X8	**b1**	0	1	2	3	2	3
	b2	2	0	3	3	2	2

	b3	1	2	0	2	2	2
	b4	2	4	1	0	1	2
	b5	1	2	2	1	0	3
	b6	3	1	2	1	1	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X9	**b1**	0	1	2	3	2	4
	b2	3	0	3	3	3	2
	b3	2	3	0	2	2	2
	b4	2	4	2	0	3	2
	b5	2	2	2	0	0	3
	b6	2	1	1	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X10	**b1**	0	2	3	2	2	3
	b2	2	0	2	3	3	0
	b3	1	2	0	2	2	2
	b4	2	3	2	0	2	3
	b5	2	2	1	1	0	3
	b6	2	1	1	2	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X11	**b1**	0	2	1	1	2	3
	b2	1	0	2	3	2	2
	b3	1	2	0	2	2	1
	b4	2	3	1	0	2	2
	b5	2	1	2	2	0	2
	b6	1	1	2	2	3	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X12	**b1**	0	3	2	1	3	4
	b2	1	0	2	3	2	2
	b3	1	1	0	2	1	1
	b4	1	2	3	0	1	2

	b5	2	2	1	3	0	3
	b6	1	2	2	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X13	**b1**	0	2	3	4	3	2
	b2	2	0	3	3	3	3
	b3	2	1	0	2	2	0
	b4	4	2	1	0	2	2
	b5	1	2	2	2	0	4
	b6	2	1	1	2	1	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X14	**b1**	0	2	2	0	3	2
	b2	2	0	3	2	3	3
	b3	1	2	0	2	2	1
	b4	2	3	1	0	2	3
	b5	2	1	2	2	0	3
	b6	2	1	2	2	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X15	**b1**	0	2	3	2	2	4
	b2	1	0	3	3	3	3
	b3	1	2	0	0	2	2
	b4	3	1	2	0	2	2
	b5	2	1	2	3	0	3
	b6	2	1	2	2	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X16	**b1**	0	2	3	2	4	2
	b2	2	0	2	3	3	3
	b3	1	2	0	2	2	1
	b4	2	3	2	0	0	1
	b5	2	3	3	2	0	2
	b6	1	2	2	2	1	0

		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X17	**b1**	0	1	2	3	2	3
	b2	2	0	3	3	2	1
	b3	1	3	0	2	2	2
	b4	2	4	2	0	1	3
	b5	3	1	2	1	0	2
	b6	1	2	2	1	3	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X18	**b1**	0	1	2	1	2	3
	b2	1	0	2	3	2	2
	b3	1	2	0	2	2	1
	b4	2	1	2	0	1	3
	b5	1	1	2	2	0	3
	b6	2	1	2	2	3	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X19	**b1**	0	2	3	2	2	3
	b2	2	0	3	4	2	0
	b3	2	3	0	2	3	2
	b4	1	4	2	0	2	1
	b5	2	1	2	2	0	3
	b6	2	1	1	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X20	**b1**	0	2	3	2	3	4
	b2	2	0	2	3	3	3
	b3	1	2	0	2	2	1
	b4	2	3	3	0	0	1
	b5	2	2	2	3	0	2
	b6	1	2	2	2	1	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**

X21	**b1**	0	3	3	3	3	4
	b2	2	0	3	3	2	2
	b3	1	1	0	2	1	1
	b4	1	3	3	0	1	3
	b5	2	1	2	3	0	3
	b6	1	2	2	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X22	**b1**	0	3	2	3	2	4
	b2	2	0	3	3	3	3
	b3	2	2	0	2	2	0
	b4	1	4	1	0	2	2
	b5	2	1	2	3	0	2
	b6	1	3	2	4	1	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X23	**b1**	0	3	2	2	3	4
	b2	2	0	2	3	3	0
	b3	1	3	0	2	1	1
	b4	2	3	3	0	2	1
	b5	1	2	2	4	0	2
	b6	1	1	2	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X24	**b1**	0	2	2	0	3	2
	b2	2	0	3	2	2	2
	b3	1	2	0	1	2	2
	b4	2	3	1	0	2	3
	b5	2	1	3	2	0	2
	b6	2	1	2	2	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X25	**b1**	0	2	2	2	3	4
	b2	2	0	2	3	3	3

	b3	1	2	0	2	2	1
	b4	2	3	2	0	0	1
	b5	2	2	2	3	0	1
	b6	1	2	2	2	1	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X26	**b1**	0	2	3	2	2	3
	b2	2	0	3	2	3	0
	b3	2	3	0	3	2	2
	b4	1	4	2	0	1	2
	b5	2	1	2	2	0	3
	b6	2	1	1	1	2	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X27	**b1**	0	1	2	3	2	3
	b2	2	0	3	3	2	2
	b3	1	2	0	2	2	1
	b4	2	4	1	0	2	1
	b5	1	2	2	1	0	3
	b6	3	2	1	1	1	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X28	**b1**	0	1	2	3	2	4
	b2	3	0	3	3	3	3
	b3	2	3	0	2	2	2
	b4	2	4	2	0	3	2
	b5	2	1	2	1	0	1
	b6	1	2	3	1	3	0
		a1	**a2**	**a3**	**a4**	**a5**	**a6**
X29	**b1**	0	2	1	1	3	3
	b2	1	0	3	2	2	2
	b3	1	2	0	1	2	2
	b4	2	3	1	0	2	1

	b5	2	2	2	1	0	2
	b6	1	1	2	2	3	0
X30	**b1**	0	2	2	3	2	4
	b2	2	0	2	3	3	3
	b3	1	2	0	2	2	1
	b4	2	3	2	0	0	1
	b5	2	2	2	3	0	1
	b6	1	2	1	2	1	0

The normalised initial direct-relation matrix D was calculated using the following equations: Eq. (2) to Eq. (5):

$$\lambda = 0.090634, D = \lambda \times Z$$

The results of which are presented in Table 4.4 and Table 4.5.

Table 4.4: The Normalised Initial Direct-Relation Matrix *z*

z					
0.0000	2.0000	2.3000	2.1333	2.4667	3.3333
1.8667	0.0000	2.6000	2.9000	2.5667	1.9667
1.2333	2.1333	0.0000	1.8000	1.9000	1.3000
1.8333	3.1333	1.8333	0.0000	1.5667	1.8667
1.8000	1.5667	1.9667	2.1000	0.0000	2.5667
1.5667	1.4667	1.7333	1.6667	1.8667	0.0000

Table 4.5: The Normalised Initial Direct-Relation Matrix *D*

D					
0.0000	0.1812	0.2084	0.1933	0.2235	0.3021
0.16918	0.0000	0.2356	0.2628	0.2326	0.1782
0.1117	0.1933	0.0000	0.1631	0.1722	0.1178
0.1661	0.2839	0.1661	0.0000	0.1419	0.1691
0.1631	0.1419	0.1782	0.1903	0.0000	0.2326
0.1419	0.1329	0.1570	0.1510	0.1691	0.0000

The total relation matrix T was calculated using Eq. (6) and Eq. (7) as shown below in Table 4.6 (*I*), Table 4.7 (*I*-*D*), Table 4.8 (Inverse of *I*-*D*) and Table 4.9 (*T*).

Table 4.6: Total Relation Matrix *T* (*I*)

T (I)					
1	0	0	0	0	0
0	1	0	0	0	0
0	0	1	0	0	0
0	0	0	1	0	0
0	0	0	0	1	0
0	0	0	0	0	1

Table 4.7: Total Relation Matrix *T* (*I – D*)

I – D =					
1.0000	-0.1813	-0.2085	-0.1934	-0.2236	-0.3021
-0.1692	1.0000	-0.2356	-0.2628	-0.2326	-0.1782
-0.1118	-0.1934	1.0000	-0.1631	-0.1722	-0.1178
-0.1662	-0.2840	-0.1662	1.0000	-0.1420	-0.1692
-0.1631	-0.1420	-0.1782	-0.1903	1.0000	-0.2326
-0.1420	-0.1329	-0.1571	-0.1511	-0.1692	1.0000

Table 4.8: Total Relation Matrix *T* (*Inverse of I – D*)

T (Inverse of I – D)					
2.6455	2.1317	2.1642	2.1845	2.1604	2.3064
1.7699	2.9613	2.1597	2.2110	2.1408	2.1891
1.3179	1.6275	2.4733	1.6385	1.6077	1.6309
1.6015	1.9842	1.9117	2.7990	1.8802	1.9737
1.5294	1.7980	1.8324	1.8674	2.6683	1.9351
1.3186	1.5559	1.5817	1.6003	1.5794	2.5002

Table 4.9: Total Relation Matrix *T*

T					
1.6455	2.1317	2.1642	2.1845	2.1604	2.3064
1.7699	1.9613	2.1597	2.2110	2.1408	2.1891
1.3179	1.6275	1.4733	1.6385	1.6077	1.6309
1.6015	1.9842	1.9117	1.7990	1.8802	1.9737
1.5294	1.7980	1.8324	1.8674	1.6683	1.9351
1.3186	1.5559	1.5817	1.6003	1.5794	1.5002

The sums of rows and columns of matrix *T* were calculated using Eq. (8) to Eq. (9), as shown in Table 4.10

Table 4.10: The Sums of Given and Received Among Six New Bloom's Taxonomy Levels

Analyse						
P1	Effect	Cause *	Cause *	Cause *	Cause *	Cause *
P2	Effect	Cause *	Cause *	Cause *	Cause *	Cause *
P3	Effect	Effect	Effect	Effect	Effect	Effect
P4	Effect	Cause *	Cause *	Effect	Cause *	Cause *
P5	Effect	Effect	Cause *	Cause *	Effect	Cause *
P6	Effect	Effect	Effect	Effect	Effect	Effect
	P1	**P2**	**P3**	**P4**	**P5**	**P6**
	Remember	**Understand**	**Apply**	**Analyse**	**Evaluate**	**Create**

In terms of the setup of the threshold value (α), this was derived from the average of elements in matrix *T*, which were calculated using Eq. (10) (see Table 4.11):

$$\propto = {}^{56.71612}/_{36} = 1.812$$

Table 4.11: The average of elements in matrix T

T						r_i	c_j	$(r_i + c_j)$	$(r_i - c_j)$	Perspective
1.6455	2.1317	2.1642	2.1845	2.1604	2.3064	12.5928	9.182859	21.77566	3.409944	**P1**
1.7699	1.9613	2.1597	2.2110	2.1408	2.1891	12.43182	11.05862	23.49044	1.373203	**P2**
1.3179	1.6275	1.4733	1.6385	1.6077	1.6309	9.295878	11.12308	20.41896	-1.8272	**P3**
1.6015	1.9842	1.9117	1.7990	1.8802	1.9737	11.15024	11.30072	22.45096	-0.15047	**P4**
1.5294	1.7980	1.8324	1.8674	1.6683	1.9351	10.63056	11.03679	21.66734	-0.40623	**P5**
1.3186	1.5559	1.5817	1.6003	1.5794	1.5002	9.136165	11.5354	20.67157	-2.39923	**P6**
						65.23746		Threshold Value α = 1.812	1.8120	

The values of t_{ij} is greater than α (1.812) and is shown as $t_{ij}*$, this represents the interaction between perspectives, e.g. the value of $t_{b1a3}(2.1845) > \alpha$ (1.812) hence the

arrow in the cause and effect diagram is drawn from *P1* (remember) to *P2* (understand). The cause and effect diagram of all six perspectives is presented visually below in Figure 4.2.

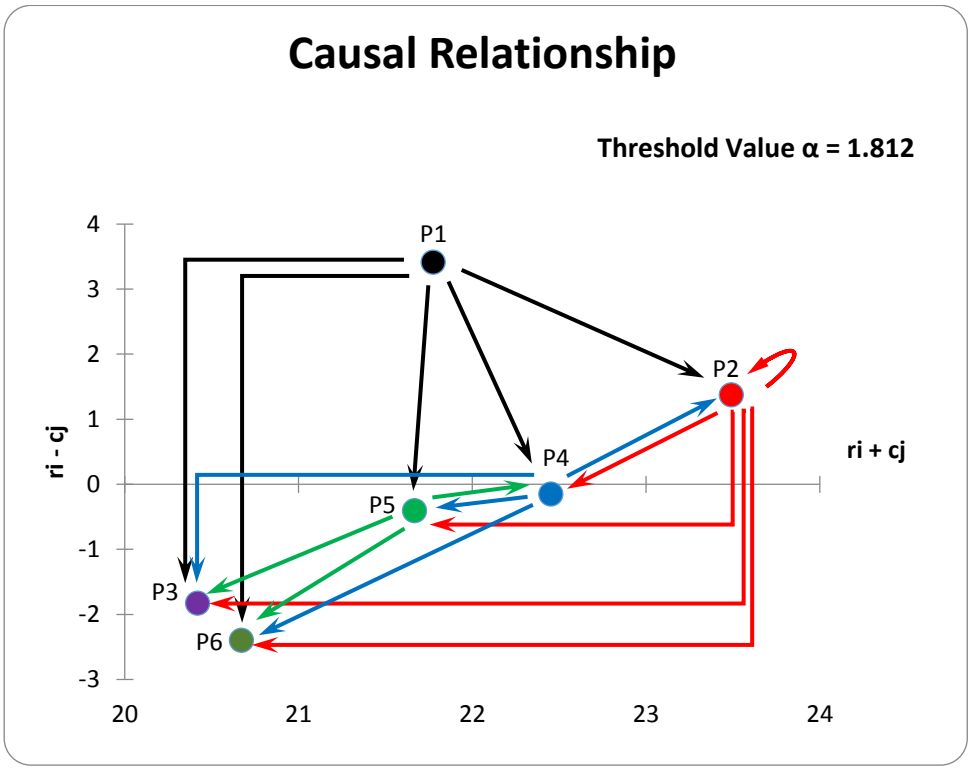


Figure 4.2: The Visualisation of the Causal Relationship by Integrating EL and KM Factors, Based on New Bloom's Taxonomy

4.4 Discussion and Results

4.4.1 Initial Finding of Running the Test (using the six perspectives)

The initial aim of using DEMETAL method was to look into the relation among critical factors as extracted from the literature reviews. Just a reminder, we were looking into six (New Bloom's Taxonomy) perspectives. We have extracted six CFs from KM and another six CFs (with similar category) from EL.

The test results was expressed in Figure 4.2 based on the results presented in Table 4.10. It is possibly best presenting the relations of both EL and KM factors categorised by the six perspectives in the following Figure 4.3 where interactions among EL and KM CSFs are expressed some of which are affecting each other. For example; in the Creating perspective, Top Management and Programme Flexibility are effected by each other. However, Programme Flexibility is effected by the remaining factors from KM. Another example is Course Quality from EL and Continual Learning from KM in the Understand perspective are causing effect on each other.

In conclusion, this experiment shows hypotheses H3 is proved to be correct. It is also found that:

H3.A is correct since the "Storage and Sharing the Knowledge" and "Perceived Usefulness" are affecting each other in the Remember perspective.

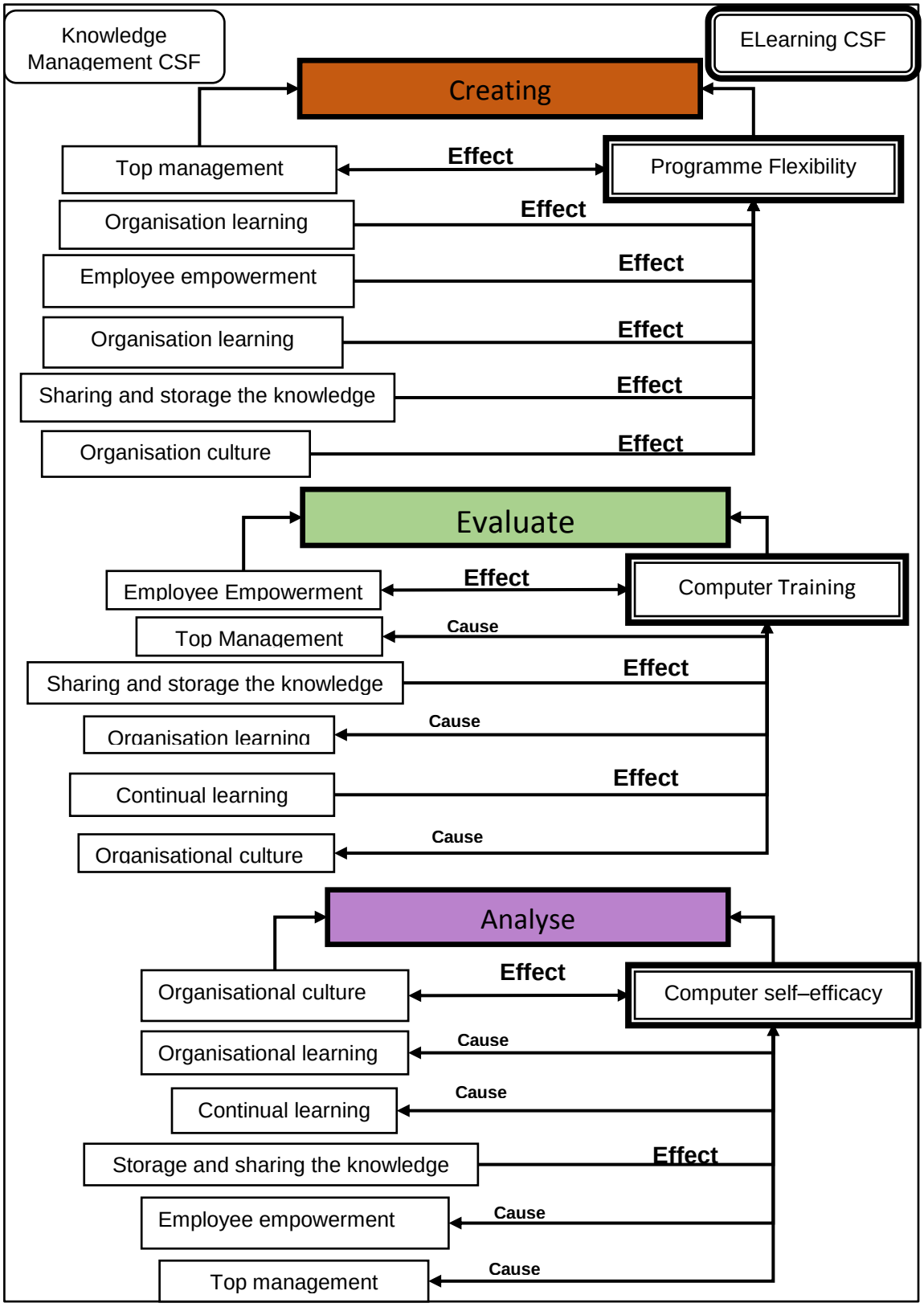
H3.B is correct where “Continual Learning” and “Course Quality” are having causal effect in the Understand perspective.

H3.C is correct where “Organisational Learning” and “Attitude towards EL” are affecting each other in the Apply perspective.

H3.D is correct since “Organisational Culture” and “Computer Self-Efficacy” are affecting each other in the Analyse perspective.

H3.E is correct where “Employee Empowerment” and “Computer Training” are affecting each other in the Evaluate perspective and finally;

H3.F is correct since “Top Management” and “Programme Flexibility” are affecting each other in the Creating perspective.


Knowledge Management CSF
ELearning CSF
Creating
Top management
Effect
Programme Flexibility
Organisation learning
Effect
Employee empowerment
Effect
Organisation learning
Effect
Sharing and storage the knowledge
Effect
Organisation culture
Effect
Evaluate
Employee Empowerment
Effect
Computer Training
Top Management
Cause
Sharing and storage the knowledge
Effect
Organisation learning
Cause
Continual learning
Effect
Organisational culture
Cause
Analyse
Organisational culture
Effect
Computer self–efficacy
Organisational learning
Cause
Continual learning
Cause
Storage and sharing the knowledge
Effect
Employee empowerment
Cause
Top management
Cause

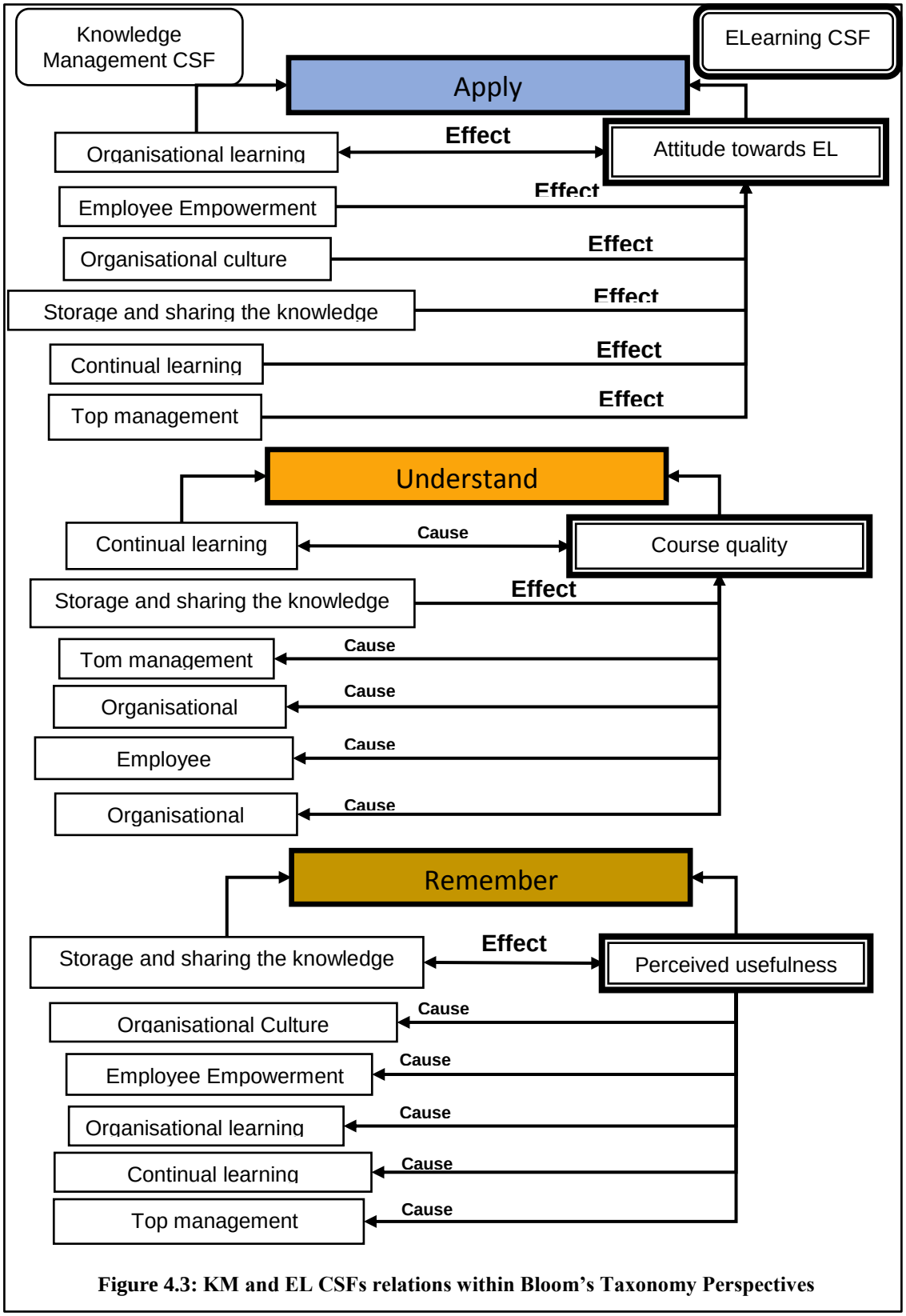


Figure 4.3: KM and EL CSFs relations within Bloom's Taxonomy Perspectives

4.4.2 Results From Using the Six Perspectives

The importance of the evaluation perspectives was determined by the $r+c$ values. Based on Table 4.10, *understanding* (P2) was the most significant evaluation perspective with the largest $r+c$ value of 23.49, whereas *applying* (P3) is the least significant perspective with the smallest $r+c$ value = 20.42. With regards to the $r+c$ values, the prioritisation of the importance of the six evaluation perspectives seems to be **P2 (*understanding*) > P4 (*analyse*) > P1 (*remember*) > P5 (*evaluate*) > P6 (*create*) > P3 (*apply*).**

Based on the r-c values, the six perspectives will now be divided into two groups: (i) the cause group and (ii) the effect group.

(i) If the value of r-c is positive or net cause, the perspective was classified in the cause group as directly affecting the others. The highest r-c factors also had the highest direct impact on the others. In the presented results, (P1) *remember* and (P2) *understanding*, were classified in the cause group with r-c values of 3.41 and 1.37, respectively. It also indicated that P1 (*remember*) was the most critical impact level on the others. Based on the matrix T in Table 4.10, it was found that P1 (*remember*) and P4 (*analyse*) had a mutual interaction as both the value of t_{b1a4} (2.16) and t_{b4a1} (1.98) were greater than α (1.812).

(ii) If the value of r-c was negative or net receive, the perspective was classified in the effect group as mainly being influenced by the others. In this study, *create* (P6), *apply* (P3), *evaluate* (P5) and *analyse* (P4) were considered in the effect group, with

r-c values of -2.39, -1.82, -0.40 and -0.15 respectively. In contrast, *create* (P6) was the most affected by the other factors of P1, P2, P4 and P5.

In summary, it is possible to conclude that there are two levels within New Bloom's Taxonomy, specifically the theory contains several factors relating to integration between EL and KM, in terms of their classification as cause factors, this included: *perceived usefulness* (b1), *storage and sharing the knowledge* (a1), *based on remembering* (P1) and *EL course quality* (b2), plus *continual learning* (a2) based on (P2) rather than other factors. From these results, it is possible to acknowledge that the link or the integration between these factors from both systems could have a cause on the rest of the factors; in addition, the most important aspect identified was with regards to the first level of P1, *remembering* / *learning process* which has the most critical impacting level on the others.

However, from these results, several levels were identified from New Bloom's Taxonomy (learning process), this consisted of several factors which were classified as having an effect by the previous factors; consequently, they were categorised as cause elements, these factors included: (b3) *attitude towards e-learning,* (a3) *organisational learning* based on *apply* (P3) and *computer self-efficacy* (b4), *organisational culture* (a4) based on *analyse* (P4) and *computer training* (b5), *employee empowerment* (a5) based on *evaluate* (P5) and finally *programme flexibility* (b6), *top management* (a6) based on *create*. Consequently from these results, it is possible to note that the link or the integration between these factors from both systems resulted in them being classified

as effect factors. In addition, the most important point is associated with the sixth level (P6) of *create* of the learning process which was most affected by the other levels.

In conclusion, these results have identify the most significant factors from both the EL and KM systems, in terms of the cause and effect based on the learning process in the UK (see Table 4.10).

Going back to paragraph 4.4.1, the finding of [P2 (*understanding*) > P4 (*analyse*) > P1 (*remember*) > P5 (*evaluate*) > P6 (*create*) > P3 (*apply*)] has significant interest. This is because the respondents were experienced. The sequence of the finding differs from the original Bloom's Taxonomy framework. It is therefore suggested that an "Expert Bloom's Taxonomy" framework can be presented in the following Figure 4.4 compared with the original framework showing in Figure 4.5 next to it.

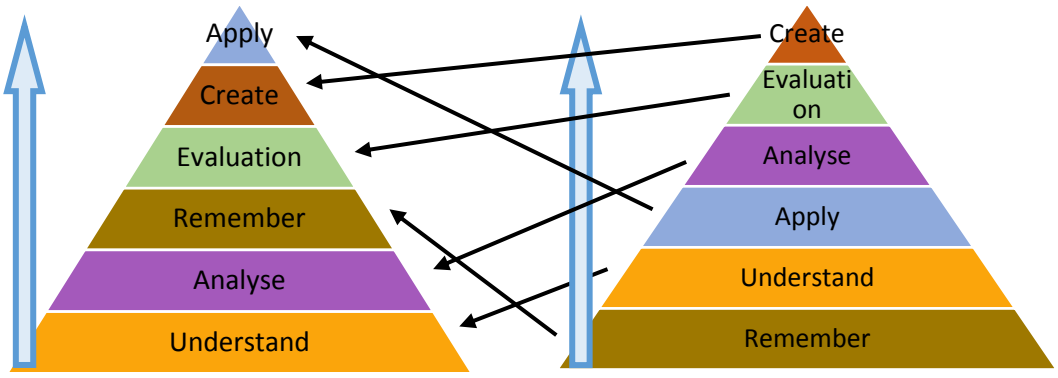


Figure 4.4: Suggested "Expert" Framework (in a combined EL – KM)

Figure 4.5: Bloom's Taxonomy Framework

As a result of this finding, it is expected that an expert would attempt to understand the problem, analyse it, then try to recall the taught knowledge to evaluate the case before creating a solution that will be implemented.

This finding may have reasonable impact on the design of taught and training programmes in the way the material is delivered to the learner. To this end, the proposed new framework may need to be tried and tested further before a conclusive outcome can be reached.

While this interesting finding is achieved, it is not perused further as it is outside the scope of this research that is looking into combining EL with KM aiming to improve the learner performance.

Chapter 5: Quantitative Data Analysis

5.1 Introduction

This chapter is completely devoted to the quantitative analysis that has been used as the basis for this research. The chapter will be divided into sections and subsections in order to provide information regarding the tools and techniques used, as well as the analysis of several factors that have been studied. With the help of quantitative data analysis methods, the researcher will use various figures and tables to present the statistical methods for analysing the results of the identified research problem.

A questionnaire was developed as a necessary tool which would contribute toward completing the objectives of this research study. The questionnaire was to be one of the main implements for gathering data. The questionnaire consisted of clear and brief instructions, it was divided into four separate sections which included: part one – which aimed to obtain very brief demographic backgrounds about the responders, this would help the researcher to, at a later stage, categorise the results; part two – which aimed to evaluate the EL factors influence on learner performance, based on New Bloom's Taxonomy (learning process); part three – which evaluated the KM factors influence on learner performance, based on New Bloom's Taxonomy (learning process); and finally, part four – which focused on the effect of the sharing of KM with EL factors on learner performance, again based on New Bloom's Taxonomy.

5.2 Quantitative Research Methods

As a result of the nature of the research problem, the researcher decided to use the quantitative approach for the following reasons. Firstly, the use of a quantitative approach allows for a good fit between the social reality of the research participants and the theories presented. Secondly, it allows for the studying of the effect of the theory (New Bloom's Taxonomy) on both the EL and KM systems. Thirdly, the quantitative approach allows the study to identify links between any significant factors, in this case any factors that are deemed to help to achieve learner performance. In addition, with the help of the quantitative analytical approach, the results can be summarised in numerical terms along with a nominative degree of confidence (Lawson, 2000). However, it should be noted that this analytical approach is not without its disadvantages, including the fact that it can use certain awkward and formal language. This approach can also allow for the making of generalisations which can lead to predictions, explanations and understanding of the data; however, sometimes this generalisations can become over-generalised. Furthermore, it is important to note that the samples that are used are very large and cannot, therefore, be used as a representative sample; not to mention that all of this makes the research very time-consuming (Creswell, 1994).

5.3 Questionnaire Design

A questionnaire design enables data to be collected from a large number of respondents, it is also one of the most inexpensive methods of collecting data. With the help of the questionnaire method, the researcher can critically analyse people on their "understanding of a specific issue", but the success of a questionnaire is dependent upon its design. For the purpose of this research, various close-ended questions, using a Likert scale, were used. Close-ended questions are advantageous as they provide information that can be very useful as it is more focused, this can help the researcher to draw conclusions about their research. Therefore, it was determined that a questionnaire design, developed using close-ended question and based on the requirements of the Likert scale, was deemed to be the most suitable for this research (Rubin and Babbie, 2009). On the other hand, there are some disadvantages of the Close-ended questions include the following points:

- They can suggest ideas that the respondent would not otherwise have.
- Respondents with no opinion or no knowledge can answer anyway.
- Respondents can be frustrated because their desired answer is not a choice.
- It is confusing if many response choices are offered.
- Misinterpretation of a question can go unnoticed.
- Distinctions between respondent answers may be blurred.
- Clerical mistakes or marking the wrong response is possible.

- They force respondents to give simplistic responses to complex issues.
- They force people to make choices they would not make in the real world.

5.3.1 Participating Organisations

Due to the limited time, finance and human resources, it was not possible to conduct a comprehensive survey in all the universities in Saudi Arabia, as a result, the study focused on just three institutions. The researcher chose the King Saud University, Imran University and King Abdulaziz University because these are the forerunners among all of the other universities in Saudi Arabia. Furthermore, King Saud University was the first to introduce the Internet and use this as a technology in 1992 (Alhajri, 2005); consequently, this provided a context for the use of this technology.

5.3.1.1 King Saud University

When the King Saud University was established in 1957 there were just two colleges of Arts and Science; since then, the number of students has considerably increased. In 2008, 72,148 students were attending bachelor's degrees and 3,285 faculty members were employed. The university currently has 19 colleges: Colleges of Arts, Science, Engineering, Business, Language and Translation, Applied Medical Science, Computer Science and Information Technology, Nutritional Sciences and Agriculture, Pharmacology, Architecture and Planning, Dentistry, Nursing, Tourism and Archaeology, Applied Studies and Community Service, and Riyadh Community College.

The college has 11 Deanships, including a Deanship of E-Learning and Distance Learning (MOHE, 2009). The King Saud University aims to provide high-quality education, produce innovative research, serve the community and contribute to knowledge building within an environment, which encourages creativity in learning and makes the best use of the available technology. Along with this, the university has partnerships with many local and global educational organisations. With the help of their strategic objective, the university could attain its goals of: providing excellence in every field, attaining distinction in specified areas, and recruiting staff who have prominent knowledge about academia, so that qualitative work can be attained instead of quantitative work. The university aims to build the capacity of their graduates, by bridging communication gaps through supportive learning environments, which would ensure flexibility and accountability, along with providing a supportive administration (MOHE, 2009).

Deanship of E-Learning and Distance Learning at King Saudi University

The aim of this deanship was to develop and diversify teaching along with certain EL methods, specifically these would be based on learning through information and technology (IT). Another aim is to be a leader in the dissemination of knowledge using modern technology and information systems. By investing in EL methods, the faculty members and students could improve the quality of their learning; specifically, learners could have the opportunity to choose the place and time to learn and the faculty members would be able to educate their students through EL programmes whereby

content is provided by ICT. Three agencies are included in the deanship, namely: the Agency of Financial and Administrative Affairs, the Agency of Technological Affairs and the Deanship Agency. Furthermore, there are two departments of Administrative Affairs and Learning and Technological Systems, all of which have a number of centres and units.

The Deanship of EL and Distance Learning is responsible for:

- The building up of strategic plans at the university for EL programmes,
- Creating an environment, which would promote EL application,
- The formation of certain technical standards and regulations at the university level for EL application,
- Developing technological skills in the faculty members, by providing technological and human support.

The deanship's strategic plan aims to achieve its vision and objectives by:

- Ensuring that the university course is developed in an electronic form,
- Providing advice and technological support to the faculty members for developing educational sites,
- Developing an environment, where the electronic communication between faculty members and students could be stimulated,
- Enabling faculty members to develop skills so that they are able to develop their courses in the electronic form,

- Providing appropriate training to the faculty members so that they could properly carry out their task of evaluating students and monitoring their results.

5.3.1.2 Imam University

The Imam University was established in 1974 and by 2008 the number of students attending bachelor's degrees exceeded 36,016 and 1,328 faculty members were employed. At present, there are 11 colleges of: Shree'a, Arabic, Science, Economics and Administrative Sciences, Languages and Translation, Computer Science and Information Technology, Engineering, Medicine, the Islamic Foundation College and Dawa and Media College. These colleges were grouped under nine deanships, including a Deanship of E-Learning and Distance Learning (MOHE, 2009). The main objective of the Imam University was to implement educational policy through the provision of graduate and postgraduate studies to students. In addition, the university aims to promote scientific research, encourage engagement in authorship, translation and publication, along with serving the community within its capacity (MOHE, 2009).

Deanship of E-Learning and Distance Learning at Imam University

This deanship aims to transform the vision of teaching and learning by introducing new technologies, through the application of new features of ICT in teaching and learning that are able to reach a wide range of learners – this would help in achieving the requirements of the market. The Iman University is composed of two agencies: the Academic Affairs Agency and the E-Learning Agency. There are various departments at the university, including: the Management of Academic Affairs, the Department of

Cultural and Media Affairs, the Technological Affairs Department and the Department of Finance and Administration, all of which have a number of centres and units. The task of both the EL and Distance Learning Deanship is to supervise the EL programmes, the university's portal and educational broadcast channels. With the help of international expertise, the deanship's strategic plan is to apply the concept of EL to reach excellence (Deanship of E-Learning at the University of Imam, 2008).

5.3.1.3 King Abdulaziz University

In 1967 King Abdulaziz University (KAU) was established in Jeddah, Saudi Arabia. It was crafted by an English architect, named John Elliot. Between 2000 and 2001, there were 2,000 faculty members and more than 37,000 students. A group of businessmen headed by Sheikh Muhammad Abu Bakr Bakhashab Pasha, with the support of a writer Hamza Bogary, launched it as a private university. With the help of a resolution passed by the Council Ministers of Saudi Arabia, KAU was transformed into a public university in 1974 and, through government adoption, it has been expanded into a large university. As per the statistical reports of 2012, from the Higher Education Ministry of Saudi Arabia, there were 6,148 faculty members and a total of 132,094 students of KAU.

The university provides a variety of educational options, in different scientific and theatrical study fields, some of which possess exclusive specialisations in areas including: Sea Sciences, Nuclear Engineering and Medical Engineering. The university respects Islamic regulations and there are different campuses for male and female students. The university strongly believes in providing technology-oriented support

services in its university, especially to the students, who are physically unable to attend classes – as a result, they offer external programmes and online programmes.

5.3.1.3.1 Deanship of E-Learning and Distance Education

E-learning administration systems were started by the KAU on(2nd 1432AH). In order to serve the teaching staff and students, this deanship was responsible for the development of the system. The KAU wanted to improve its EL system, this led to the development of the EL administration system. According to Prof. Hisham Bin Jamil Al Bardisy, the Dean for Distance Learning conveniently developed the EL administration system by utilising the latest and updated programming tools. The system was developed in line with international standards. Ultimately, this system will facilitate the university by permitting it to receive an increased number of students. This system promotes an integrated environment for students and teachers, furthermore, it can be conveniently used and shows compatibility with supporting systems that exist for distance learning programmes (King Abdulaziz University, 2014).

5.3.1.3.2 Management Department at King Abdulaziz University

One of the significant departments at the KAU, in Jeddah, is the project management department; they are responsible for the supervision of KAU projects from their initiation to completion. Thus, this department plays an important role in the establishment of a better learning environment, for students, employees and teachers, by managing KAU projects from start to finish.

5.4 Primary Data Sources

The main source of data for this study is the primary source, specifically the respondents themselves. All of the respondents involved in this study were from the Saudi Arabia

5.5 Scaling Techniques

The Likert scaling technique is a psychometric scale that is prominently used in research that involves questionnaires. The term Likert scaling is seldom used interchangeably with the term of rating scales, instead it is commonly known as Likert-type scale. The Likert scaling technique is rarely used; but, the answer format of the scaling technique is one of the most frequently used survey methods (Babbie, 2012). The technique is based on the responses gained by the respondents. Although the technique is used seldom, it is quite easy to understand (Corbetta, 2003). The scale for measuring responses can be created by simply adding the responses of the questionnaire. While designing the scale for the Likert technique, a general assumption of equal distance between the two items is made by the researcher. The Likert scaling technique, which is a non-comparative itemised rating scale technique, is used for this research. In an attempt to capture responses, the respondents were asked to indicate their degree of agreement or disagreement on a five-point Likert scale, along with the extent of influence or non-influence, again on a five-point Likert scale.

5.6 Questionnaire Analysis

The devised questionnaire was provided to obtain responses from the Saudi Arabian participants. This mode of data collection is dependent on the respondents filling in the given survey questionnaire.

The questionnaire utilised in this research was divided into the following three sections:

- The first section focuses on the personal information of the respondents.
- The second section captures the degree of agreement/disagreement of the respondents on the different parameters of:
    a. The effect of EL factors on achieving learner performance by using the New Bloom's Taxonomy theory.
    b. The effect of KM factors on achieving learner performance by using the New Bloom's Taxonomy theory.
- The third section captures the extent of influence/non-influence on the effect of sharing KM with EL factors on the learning process (the KM and EL factors are mentioned below):
    a. Remember/identity;
    b. Understanding/summarising;
    c. Applying/implantation;
    d. Analysis/organising;
    e. Evaluation;

f. Creating/designing.

5.6.1 Data Collection

A total of 300 survey questionnaires were completed, however only 133 were usable; of these, all 133 responses were recorded in the study. MS-Word was used to design the questionnaire, the data was then exported to SPSS for analysis.

5.6.2 Data Analysis

5.6.2.1 Methodology

For the purpose of the data analysis, descriptive analyses, along with discriminant analyses, were used in this study. The main data analysis provides a number of findings, these will be discussed further in terms of the recommendations that they provide.

5.6.2.2 SPSS – The Data Analysis Tool

SPSS is a software package that was chosen to be used for the analysis of this research. SPSS for Microsoft Windows provides a powerful statistical analysis and data management system. SPSS is a Windows based program that can be used to perform data entry and analysis, it can also create tables and graphs. SPSS is capable of handling large amounts of data and can perform all of the analyses covered in the text, as well as much more. SPSS is commonly used across the social sciences and in the business world, thus familiarity and knowledge of this program should be beneficial to researchers. SPSS is regularly updated. The analyses presented in this document were

from an earlier version, but the differences should not be significant enough to cause any problems. The book *Discovering Statistics Using SPSS*, by Andy Field (Field, 2009), provides an excellent synopsis as well as detailed insight into the new features of SPSS as a package. It is important that those who have been using the software for many years, still learn about the new features of newer versions as the package is continually evolving with each new update.

5.6.3 Plan of Data Analysis

A plan for the way in which the data analysis will be presented, this will be followed by the actual data analysis.

5.6.4 Data Evaluation

- First of all, data screening is completed to identify any missing data in the responses.
- The dependent variable made use of the five-point Likert scale technique (strongly disagree, disagree, neither agree/ disagree, agree, strongly agree).
- The dependent variable also made use of the five-point Likert scale technique (no influence, low influence, medium influence, high influence, very high influence).
- Data coding was then completed in SPSS, this included labelling all of the factors that were created during the analysis. This was done to standardise the responses in a numeric format, which helps with the analysis.

5.6.5 Discriminate Analysis

In terms of the SPSS analysis, the discriminate analysis is performed to understand the segmentation or classifications, and to predict group membership from the captured responses.

5.6.6 The Results

Demographic Structure

The demographic structure of the country plays a significant role in any analysis of the population. In the research conducted, in the context of KM and EL, all of the 133 participants were from Saudi Arabia.

5.7 Descriptive Analysis

All 133 respondents were considered within the analysis. Table 5.1 and Figure 5.1 detail demographics about respondents with regards to age; it can be noticed that the majority (60%) of the respondents belonged to the age group 25 to 35 years, whereas only 7.5% belonged to the age group of 45 to 60 years.

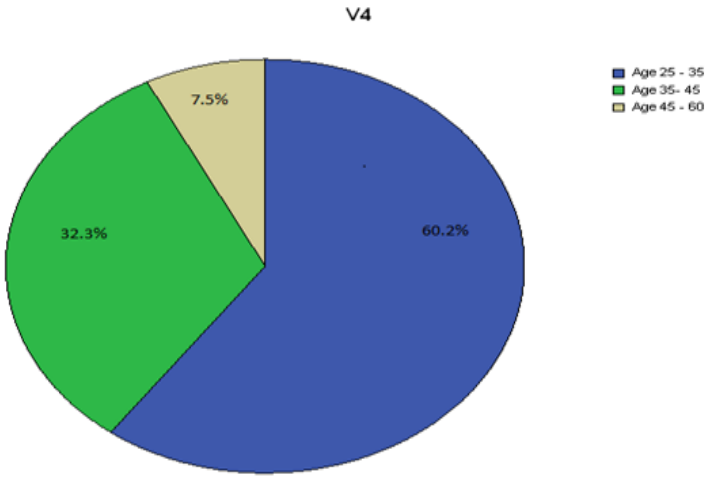


Figure 5.1: Descriptive Statistics

With regards to the 133 participants, Table 5.1 is also describes their agreement or disagreement towards the different parameters associated with improving learner performance, as detailed by the respondents.

Table 5.1: Model – 1: The Effect of EL Factors on Improving Learner Performance Using the New Bloom's Taxonomy (Learning Process) Framework

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Programme flexibility leads to "creating knowledge"	3.4%	17.2%	20.7%	52.6%	6.0%
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	0.9%	10.3%	25.0%	34.5%	29.3%
3. Computer training leads to "analyse the knowledge"	-	9.5%	24.1%	50.9%	15.5%
4. Attitude towards e-learning achieves better "understanding/interpreting of the knowledge"	9%	5.2%	19%	56%	19%
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "evaluate/experiment the knowledge"	1.7%	9.5%	22.4%	42.2%	24.1%
6. Perceived usefulness (The degree to which a person believes that using EL system would enhance their learning performance) helps to "apply/implement the knowledge"	1.7%	6.0%	19.%	44.8%	27.6%
Max(column)	**9.00%**	**17.20%**	**25.00%**	**56.00%**	**29.30%**

In this table, the maximum responded is 56% agreeing that [4. Attitude towards e-learning achieves better "understanding/interpreting of the knowledge"] (See the Appendix: data analysis).

While 29.3% were strongly agree that [2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"].

One may conclude from this outcome that considering the stated EL factors will have a positive effect on the learner performance. This is will be further analysed using SPSS in 5.7 "Descriptive Analysis" and 5.8 "Inferential Analysis".

With regards to the 133 respondents who were considered within the analysis. Table 5.2 below, describes the agreement or disagreement towards each of the different parameters, from the respondents' viewpoint.

Table 5.2: Model-2 – The Effect of KM Factors on Learner Performance within the New Bloom's Taxonomy (Learning Process) Framework

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Top management plays a key part on "creating knowledge"	0.9%	6.9%	31.9%	43.1%	17.2%
2. Continual learning (e.g. workshops, seminars, home-study or online courses, conferences), tends to achieve better "understanding and interpreting the knowledge"	2.6%	11.2%	11.2%	46.6%	23.3%
3. Employee empowerment "contributes to" the "evaluate and check the knowledge process"	-	11.2%	16.4%	46.4%	23.3%
4. Organisational learning (e.g. systems thinking, personal mastery, mental models, shared vision and team learning) contributes to the "apply/implement the knowledge stages "	0.9%	8.6%	22.4%	42.2%	24.1%
5. Organisational culture (e.g. values, visions, norms, working language) helps to achieve "analyses/compare knowledge"	2.6%	6.9%	18.1%	53.4%	21.6%
6. Storing and sharing the knowledge (e.g. document repositories and management systems, databases) plays an important part in realising the "remembering and identification of knowledge"	0.9%	5.2%	21.6%	43.1%	29.3%
Max(column)	**2.60%**	**11.20%**	**31.90%**	**53.40%**	**29.30%**

In this table, the maximum responded of 53.4% are agreeing that (5. Organisational culture helps to achieve "analyses/compare knowledge) while 29.3% were strongly agreed that [6. Storing and sharing the knowledge plays an important part in realising the "remembering and identification of knowledge"] (See the Appendix: data analysis).

The following Table 5.3 describes the influence or non-influence of different parameters on the respondents.

Table 5.3: Model-3 – The Effect of Sharing KM with E-L Factors on the Learner Performance using the New Bloom's Taxonomy; Remember/Identity Category

	No Influence	Low Influence	Medium Influence	High Influence	Very High Influence
1. Top management has appositive effect on "programme flexibility"	15.8%	14.3%	21.8%	33.8%	14.3%
2. "Programme flexibility" has effect on top management	16.5%	11.3%	34%	30.8%	15%
3. Employee empowerment affects positively "computer training"	18.0%	9.0%	25.6%	29.3%	18%
4. "Computer training" affects positively employee empowerment	17.3%	10.5%	10.5%	42.1%	19.5%
5. "Computer self-efficacy" has positive effect on the organisational learning	15.8%	3.8%	27.1%	37.6%	15.8%
6. Organisational culture positively affects "computer self-efficacy	14.3%	9%	21.8%	37.6 %	17.3%
7. "Attitude towards e-learning" can effect organisation learning	15.0%	6.8%	21.8%	42.9%	13.5%
8. Organisational learning can have an effect on "attitude towards e-learning"	14.3%	9.0%	21.8%	37.6%	17.3%
9. "E-learning course quality" has positive effect on continual learning	15.8%	13.5%	18%	33.8%	18%
10. Continual learning has positive effect on the "E-learning course quality"	17.3%	15%	18.0%	33.1%	16.5%
11. "Perceived usefulness" has positive effect on storage and sharing the knowledge	15.8%	14.3%	23.3%	33.1%	13.5%
12. Storage and sharing the knowledge has an effect on "perceived usefulness"	17.3%	10.5 %	24.1%	33.8%	14.3%
Max(column)	**18.00%**	**15.00%**	**34.00%**	**42.90%**	**19.50%**

In this table, the maximum responded is 42.9% believe that (7. Attitude towards e-learning" can effect organisation learning) enjoys High Influence to achieve the Identification of knowledge. While 19.5% believe that (4. "Computer training" affects positively employee empowerment) have Very High Influence on the "remembering and

identification of knowledge" category. Moreover there were similar "Medium Influence" feedback of 21.8% in relation to [8. Organisational learning can have an effect on "attitude towards e-learning", Attitude towards e-learning" can effect organisation learning; [6. Organisational culture positively affects "computer self-efficacy] (see the Appendix: data analysis). It appears those factors collectively has a relation with the Identify/Remember category of the Blooms Taxonomy.

The responses from a total of 133 respondents were considered for the analysis. The following

Table 5.4 describes the influence or non-influence of the different parameters as indicated by the respondents.

Table 5.4: Model-4 – The Effect of Sharing KM with EL Factors on the Learner Performance using the New Bloom's Taxonomy; Understanding/Summarising Category

	No Influence	Low Influence	Medium Influence	High Influence	Very High Influence
1. "Attitude towards e-learning" has positive effect on organisational learning	13.6%	17.4%	28.0%	28.0%	12.9%
2. Organisational learning can have an effect on the "attitude towards e-learning"	15.2%	9.1%	29.5%	32.6%	13.6%
3. "E-learning course quality contents" have positive effect on continual learning	14.4%	12.1%	21.2%	37.9%	14.4%
4. Continual learning has an effect on "E-learning course quality contents"	18.2%	13.6%	18.9%	32.6%	16.7%
5. "Perceived usefulness" has positive effect on storage and sharing the knowledge	16.7%	16.7%	21.2%	29.5%	19.7%
6. Storage and sharing the knowledge has an effect on "perceived usefulness"	15.2%	15.2%	25.8%	28%	15.9%
7. "Computer training" affects positively employee empowerment	15.9%	6.8%	20.5%	43.9%	12.9
8. Employee empowerment has effect on the	15.2%	10.6%	23.5%	34.1%	16.7%

	No Influence	Low Influence	Medium Influence	High Influence	Very High Influence
"computer training"					
9. "Programme flexibility" has effect on top management	15.2%	9.1 %	23.5%	34.8%	17.4%
10. Top management has positive effect on "programme flexibility"	13.6%	7.6%	21.2%	39.4%	18.2%
11. Organisational culture affects positively "computer self-efficacy"	14.4%	9.1%	21.2%	37.9%	17.4%
12. "Computer self-efficacy" has effect on organisational culture	14.4%	5.3%	24.2%	34.1%	22%
Max(column)	**18.20%**	**17.40%**	**29.50%**	**43.90%**	**22.00%**

In this table, the maximum responded is 43.9% indicate high influence were that (7. Computer training" affects positively employee empowerment) helps to achieve the Understanding / Summarising the knowledge though 22% were very high influence that (12. "Computer self-efficacy" has effect on organisational culture) in the "Understanding/Summarising the knowledge". Additionally, there was similar percentage 15.2% "No Influence" that (9. "Programme flexibility" has effect on top management; 8. Employee empowerment has effect on the "computer training" and 6. Storage and sharing the knowledge has an effect on "perceived usefulness"). However, (9. "Programme flexibility" has effect on top management and 8. Employee empowerment has effect on the "computer training" have same percentage 23.5% which indicate medium influence.

One could conclude from this outcome that considering the effect of sharing KM with EL factors on the learner performance using the New Bloom's Taxonomy (Understanding / Summarising the knowledge Category) will have a positive effect on

the learner performance. This will be further analysed using SPSS in 5.8 "Inferential Analysis".

The following Table 5.5 describes the influence or non-influence of the different parameters from the respondents' perspective.

Table 5.5: Model-5 – The Effect of Sharing KM with EL Factors on the Learner Performance using the New Bloom's Taxonomy, Applying/Implementation Category

	No Influence	Low Influence	Medium Influence	High Influence	Very High Influence
1. "Perceived usefulness" has a positive effect on storage and sharing the knowledge	17.4%	19.7%	21.2%	25%	16.7%
2. Storage and sharing the knowledge has an effect on " perceived usefulness"	16.7%	11.4%	28.0%	27.3%	16.7%
3. "Computer self – efficacy" affects positively organisational culture	15.9%	3.8%	25.0%	38.6%	16.7%
4. Organisational culture has an effect on "Computer self – efficacy"	15.2%	8.3%	21.2%	34.1%	21.2%
5. Organisational learning can have an effect on "attitude towards e-learning"	15.9%	6.8%	15.2%	41.1%	20.5%
6. "Attitudes towards e-learning" can positively affect organisational learning	15.9%	4.5%	25%	35.6%	18.9%
7. "Programme flexibility" has an effect on the top management	15.9%	4.5%	25%	35.6%	18.9%
8. Top management has an effect on "programme flexibility"	14.4%	6.8%	18.9%	37.6%	22%
9. Continual learning has an effect on "e-learning course quality"	18.2%	13.6%	18.9%	32.6%	16.7%
10. "E-learning course quality contents" affect positively continual learning	16.7%	10.6%	21.2%	29.5%	22%
11. Employee empowerment has an effect on "computer training"	15.2%	15.2%	21.2%	34.1%	21.2%
12. "Computer training" has a positive effect on employee empowerment	15.9%	3.8%	25.0%	38.6%	16.7%
Max(column)	**18.20%**	**19.70%**	**28.00%**	**41.10%**	**22.00%**

In this table, the maximum responded is 41.1% showing High Influence towards (5. Organisational learning can have an effect on "attitude towards e-learning) to attain the Applying / Implementation the knowledge while 22% believed that (10. "E-learning course quality contents" affect positively continual learning) and (8. Top management has an effect on "programme flexibility") enjoy Very High Influence in achieving butter Applying / Implementation of the knowledge. On the other hand, from the above table we can see there were several factors have similar percentage (15.9%) of No Influence that (3. "Computer self – efficacy" affects positively organisational culture), (5. Organisational learning can have an effect on "attitude towards e-learning"), (6. "Attitudes towards e-learning" can positively affect organisational learning, (7. "Programme flexibility" has an effect on the top management) and (12. Computer training" has a positive effect on employee empowerment). Though, others factors have equal personage (16.7%) Very High Influence that (1. "Perceived usefulness" has a positive effect on storage and sharing the knowledge), (2. Storage and sharing the knowledge has an effect on "perceived usefulness"), (3. Computer self – efficacy" affects positively organisational culture), (9.Continual learning has an effect on "e-learning course quality) and (12. "Computer training" has a positive effect on employee empowerment).

A conclusion from this outcome that considering the effect of sharing KM with E-L Factors on the Learner Performance using the New Bloom's Taxonomy; Applying/Implementation the knowledge Category will have a positive effect on the

learner performance. This is will be further analysed using SPSS 5.8 "Inferential Analysis".

Table 5.6 below describes the influence or non-influence of the different parameters from the respondents.

Table 5.6: Model-6 – The Effect of Sharing KM with EL Factors on the Learner Performance using the New Bloom's Taxonomy; Analysis/Organising Category

	No Influence	Low Influence	Medium Influence	High Influence	Very High Influence
1. Employee empowerment has an effect on "computer training"	17.3%	13.5%	21.1%	30.1%	18%
2. "Computer training" affects positively on employee empowerment	15.0%	6.8%	28.6%	35.3%	14.3%
3. "E-learning course quality contents" have an effect on continual learning	16.5%	14.3 %	21.8%	30.1%	17.3%
4. Continual learning has an effect on "e-learning course quality"	14.3 %	14.3 %	21.8%	30.1%	17.3%
5. Top management has an effect on "programme flexibility"	15%	6%	17.3%	42.1%	19.5%
6. "Programme flexibility" affects positively on the top management	18.8%	5.3%	23.1%	27.1%	24.8%
7. "Attitudes towards e-learning" have an effect on organisational learning	16.5%	7.5%	20.3%	33.8%	21.8%
8. Organisational learning has an effect on "attitude towards e-learning"	20.3%	6%	19.5%	30.8%	23.3%
9. Storage and sharing the knowledge has an effect on "perceived usefulness"	16.5%	16.5%	20.3%	30.1%	19.5%
10. "Perceived usefulness" has a positive effect on storage and sharing the knowledge	17.35%	11.3%	20.3%	31.6%	19.5%
11. "Computer self-efficacy" has an effect on organisational culture	15.8%	7.5%	19.5%	35.3%	2.18%
12. Organisational culture affects positively on "computer self-efficacy"	15.8%	7.5%	19.5%	35.3%	21.8%
Max(Column)	**20.30%**	**16.50%**	**28.60%**	**42.10%**	**24.80%**

The above table shows the maximum responded of 42.1% were of High Influence that (5. Top management has an effect on "programme flexibility") within the Analysis /

Organising the knowledge however, 24.8% were showing Very High Influence of (6. "Programme flexibility" affects positively the top management) in this category. In addition, there are several factors have similar percentage (21.8%) indicated Very High Influence that (7. "Attitudes towards e-learning" have an effect on organisational learning), (11. "Computer self-efficacy" has an effect on organisational culture) and (12. Organisational culture affects positively on "computer self-efficacy). At the same time, we found that others have equal percentage (16.5%) of No Influences for (3. "E-learning course quality contents" have an effect on continual learning), (7. "Attitudes towards e-learning" have an effect on organisational learning) and (9. Storage and sharing the knowledge has an effect on "perceived usefulness"), while, 30.1% believed a High Influence of several factors (1. Employee empowerment has an effect on "computer training), (3. "E-learning course quality contents" have an effect on continual learning), (4. Continual learning has an effect on "e-learning course quality") and (9. Storage and sharing the knowledge has an effect on "perceived usefulness) (See the Appendix: data analysis).

One might conclude from this outcome that considering the effect of sharing KM with E-L Factors on the Learner Performance using the New Bloom's Taxonomy hence Applying / Implementation of the knowledge is expected to have positive effect on the learner performance. This is will be further analysed using SPSS in 5.8 "Inferential Analysis".

The following Table 5.7 describes the influence or non-influence of the different parameters from the respondents.

Table 5.7: Model-7 – The Effect of Sharing KM With EL Factors on the Learner Performance using the New Bloom's Taxonomy; Evaluate Category

	No Influence	Low Influence	Medium Influence	High Influence	Very High Influence
1. "Computer self-efficacy" affects positively on organisational culture	20.3%	5.3%	18%	29.3%	27.1%
2. Organisational culture has an effect on "computer self-efficacy"	18%	7.5%	22.6%	40.6%	11.3%
3. "Attitudes towards e-learning" have an effect on organisational learning	15.9%	4.5%	25.0%	35.6%	18.9%
4. Organisational learning has an effect on "attitude towards e-learning"	15.9%	6.8%	15.2%	41.7%	20.5%
5. "E-learning course quality contents" affect positively on continual learning	21.1%	12.8%	18%	22.6%	25.6%
6. Continual learning has an effect on "e-learning course quality"	21.1%	21.1%	23.3%	27.1%	18.8%
7. "Perceived usefulness" has an effect on storage and sharing the knowledge	17.3%	11.3%	20.3%	19.5%	31.6%
8. Storage and sharing the knowledge has an effect on "perceived usefulness"	16.5%	13.5%	20.3%	30.1%	19.5%
9. "Computer training" has a positive effect on employee empowerment	18.8%	3.3%	23.3%	35.3%	18.8%
10. Employee empowerment has an effect on "computer training"	15.25%	8.3%	21.2%	34.1%	21.2%
11. Programme flexibility has an effect on the top management	15.2%	15.2%	19.7%	38.6%	15.2%
12. Top management's effect on programme flexibility	18.0%	11.3%	18.8%	35.3%	16.5%
Max(Column)	**21.10%**	**21.10%**	**25.00%**	**41.70%**	**31.60%**

In table above, the maximum responded of 41.7% indicated a High Influence of (4. Organisational learning has an effect on "attitude towards e-learning") in the category of Evaluate the knowledge however 31.6% were indicating Very High Influence of (7. "Perceived usefulness" has an effect on storage and sharing the knowledge) when evaluating the knowledge. The most interesting point is that (20.3%) show Medium

Influence on (7. Perceived usefulness" has an effect on storage and sharing the knowledge) and (8. Storage and sharing the knowledge has an effect on "perceived usefulness). Moreover, (5. "E-learning course quality contents" affect positively on continual learning and (6. Continual learning has an effect on "e-learning course quality") show 21.1% had No Influence (See the Appendix: data analysis).

Therefore, it is reasonable to consider the effect of sharing KM with E-L will positively influence the learner performance in the domain of the New Bloom's Taxonomy; Applying / Implementation the knowledge. This will be further analysed using SPSS in 5.8 "Inferential Analysis".

Table 5.8 below describes the influence or non-influence of the different parameters from the respondents.

Table 5.8: Model-8 – The Effect of Sharing KM with EL Factors on the Learner Performance using the New Bloom's Taxonomy; Creating, Designing Category

	No Influence	Low Influence	Medium Influence	High Influence	Very High Influence
1. "E-Learning course quality contents" affect positively continual learning	17.3%	16.5%	21.1%	27.1%	18%
2. Continual learning effects on "e-learning course quality"	19.5%	10.5%	21.1%	30.8%	18%
3. "Perceived usefulness" has an effect on storage and sharing the knowledge	19.5%	9.0%	24.1%	28.6%	18.8%
4. Storage and sharing the knowledge has an effect on "perceived usefulness"	21.8%	12.0%	24.1%	25.6%	16.5%
5. "Computer training" affects positively employee empowerment	18.8%	11.3%	18.8%	35.3%	16.5%
6. Employee empowerment has an effect on "computer training"	9.8%	9.8%	21.1%	28.6%	21.8%

	No Influence	Low Influence	Medium Influence	High Influence	Very High Influence
7. Organisational learning has an effect on "attitude towards e-learning"	18.8%	2.3%	30.8%	30.8%	20.3%
8. "Attitude towards e-learning" affects positively on organisational learning	18.8%	9.8%	14.3%	39.1%	18.0%
9. Organisational culture has an effect on "computer self-efficacy"	18.0%	6.0%	28.6%	32.3%	15%
10. "Computer self-efficacy" has a positive effect on organisational culture	18.0%	9.0%	22.6%	34.6 %	15.8%
11. Top management has an effect on "programme flexibility"	18.8%	3.8%	23.3%	35.3 %	18.8 %
12. "Programme flexibility" has an effect on top management	16.5%	3.8%	23.3%	35.3%	23.3%
Max(Column)	**21.80%**	**16.50%**	**30.80%**	**39.10%**	**23.30%**

In this table, the maximum responded of 39.1% show High Influence of (8. Attitude towards e-learning" affects positively on organisational learning) on Create the Knowledge while 23.3% have Very High Influence of (12. "Programme flexibility" affects positively on the top management) on Create the Knowledge. Furthermore, the table above illustrations that about 18.8% showed No Influence of (5. "Computer training" affects positively employee empowerment), (7. Organisational learning has an effect on "attitude towards e-learning), (8. Attitude towards e-learning" affects positively on organisational learning) and (11. Top management has an effect on "programme flexibility"). Additionally, there are several factors have similar percentage (21.1%) indicate that Medium Influence of (1. "E-Learning course quality contents" affect positively continual learning), (2. Continual learning effects on "e-learning course quality") and (6. Employee empowerment has an effect on "computer training").

We can close from this outcome that considering the stated The Effect of Sharing KM with E-L Factors on the Learner Performance using the New Bloom's Taxonomy; Create the Knowledge Category will have a positive effect on the learner performance. This will be further analysed using SPSS in 5.8 "Inferential Analysis".

5.8 Inferential Analysis

5.8.1 Discriminate Analysis

A discriminant analysis was performed to check which of the variables affected the dependent variable the most.

Model- 1 – The effect of EL factors on achieving learner performance to Achieve the New Bloom's Taxonomy (learning process) theory.

- **The Dependent Variable**
    - Attitude towards EL achieves better "understanding/interpreting the knowledge".

This variable is a category variable, as a result discriminant analysis was used. The categories included: Strongly Agree, Agree, Neither Agree/Disagree, Disagree, Strongly Disagree.

- **The Independent Variables**

- Programme flexibility leads to knowledge creation.
- In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying knowledge".
- Computer training leads to "analyse knowledge".
- Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "evaluate/experiment the knowledge".
- Perceived usefulness (the degree to which a person believes that using the EL system would enhance their learning performance) helps to "apply/implement knowledge".

Table 5.9: Model-1: Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		116	100.0
Excluded	Missing or out-of-range group codes.	0	0.0
	At least one missing discriminating variable.	0	0.0
	Both missing or out-of-range group codes and at least one missing discriminating variable.	0	0.0
	Total	0	0.0
Total		116	100.0

Responses were collected from a total of 133 respondents; however, only 116 cases were considered. The analysis case processing summary, in Table 5.9, indicates that

there were zero missing and no invalid responses. As a result, all of the 116 responses were considered for further analysis.

Table 5.10: Model-1: Eigen-Values

Function	Eigen-Value	% of Variance	Cumulative %	Canonical Correlation
1	0.564(a)	70.6	70.6	0.600
2	0.136(a)	17.0	87.6	0.346
3	0.068(a)	8.5	96.2	0.253
4	0.031(a)	3.8	100.0	0.172

The first four canonical discriminate functions were used in the analysis.

Table 5.10, above, presents the Eigen-value of 0.564; this value indicates that variance in the dependent variable is explained by the function. High Eigen values are indicative that the function explains the variation in the dependent variable, to a large extent. The square of the canonical correlation is the percent of variation in the dependent discriminated by independents in the analysis. Thus, for this data, the square of the canonical correlation is 0.600, i.e., the function is explaining 60% of the variance in the dependent variable.

The Eigen-value, for all of the functions, with the exception of the first function, were insignificant. Consequently, only function 1 will be considered for further analysis.

Table 5.11: Model-1: Wilk's Lambda

Test of Function(s)	Wilk's Lambda	Chi-Square	Df.	Sig.
1 through 4	0.500	73.754	20	0.000

2 through 4	0.800	24.572	12	0.017
3 through 4	0.908	10.565	6	0.103
4	0.970	3.317	2	0.190

The Wilk's lambda tests the significance of the Eigen-value for each discriminant function. As can be seen in Table 5.11, a Chi-square at 20 degrees of freedom is highly significant, indicating that the function is discriminating. The lambda value is inversely proportional to the canonical correlation, the threshold for which is 0.5 for Wilk's lambda. Moreover, the lower the value the better the model is; hence, the results are appropriate.

Table 5.12: Model-1: Standardised Discriminate Function

Labels		Function			
		1	2	3	4
A	Programme flexibility leads to "knowledge creation".	0.097	-.0436	0.665	0.992
B	In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying knowledge".	0.028	0.910	-0.228	-0.834
C	Computer training helps to "analyse the knowledge"	0.571	-0.582	0.171	-0.503
D	Computer self-efficacy (e.g. judgment of one's capability to use a computer) supports "evaluate/experiment the knowledge".	0.560	0.086	-0.824	0.363
E	Perceived usefulness (the degree to which a person believes that using the e-learning system would enhance their learning performance) helps to "apply/implement the knowledge".	0.151	0.376	0.570	0.185

The standardised discriminant function coefficients in Table 5.12 indicate the relative importance of the independent variables in predicting the dependent variable (DV), i.e. *attitude towards e-learning achieves better "understanding/interpreting the knowledge"*.

The Standardised Discriminate Function

$$DV = 0.097A + 0.028B + 0.671C + 0.560D + 0.151E$$

As only the first function is relevant, based on the Wilk's lambda test results, the discriminant function is created for only the first function presented in Table 5.12.

It is possible to conclude from the results that amongst the factors, the majority of the respondents expressed agreement towards: *Effect of EL factors on the learner performance to reach (learning process) theory* as a result of *Computer self-efficacy*

(e.g. judgment of one's capability to use a computer) supports to "evaluate/experiment the knowledge" by 0.560, while *"Computer training leads to "analyse the knowledge"* by 0.571.

Model -2 -The effect of EL factors on achieving learner performance to achieve the New Bloom's Taxonomy (learning process) theory.

- **Dependent Variable**
    - Organisational learning contributes to the "apply/implement the knowledge stages".

This variable is a category variable, hence discriminate analysis was used. The categories included: Strongly Agree, Agree, Neither Agree/Disagree, Disagree, Strongly Disagree.

- **Independent Variables**
    - "Top management plays a key part in "creating knowledge".
    - Continual learning (e.g. workshops, seminars, home-study or online courses, conferences), tends to achieve better "understanding and interpreting the knowledge".
    - Employee empowerment contributes to the "evaluate and check the knowledge process".

- Organisational culture (e.g. values, visions, norms, working language) helps to achieve "analyses/compare knowledge".

- Storing and sharing the knowledge plays an important part in realising the "remembering and identification of knowledge".

Table 5.13: Model-2: Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		116	100.0
Excluded	Missing or out-of-range group codes.	0	0.0
	At least one missing discriminating variable.	0	0.0
	Both missing or out-of-range group codes and at least one missing discriminating variable.	0	0.0
	Total	0	0.0
Total		116	100.0

Responses were collected from a total of 133 respondents; however, only 116 cases were considered. The analysis case processing summary, in Table 5.13, displays that there were zero missing and no invalid responses which led to the 116 responses being considered for further analysis.

Table 5.14: Model-2: Eigen-Values

Function	Eigen-Value	% of Variance	Cumulative %	Canonical Correlation
1	0.544(a)	86.9	86.9	0.594

2	0.070(a)	11.2	98.2	0.256
3	0.011(a)	1.8	100.0	0.106
4	0.000(a)	0.0	100.0	0.011

The first four canonical discriminate functions were used in the analysis.

Table 5.14, above, shows that the Eigen-value of 0.544 was recorded, which is indicative that variance in the dependent variable is explained by that function. High Eigen values indicate that the function explains variation in the dependent variable to a large extent. The square of the canonical correlation is the percent of variation in the dependent discriminated by the independents in analysis. For this data, the square of the canonical correlation is 0.594, i.e., the function explains 60% variance in the dependent variable.

The Eigen values for all the functions, except 1, were insignificant. Therefore, only the first function will be considered for further analysis.

Table 5.15: Model-2: Wilk's Lambda

Test of Function(s)	Wilk's Lambda	Chi-Square	Df.	Sig.
1 through 4	0.598	56.789	16	0.000
2 through 4	0.924	8.772	9	0.459
3 through 4	0.989	1.255	4	0.869
4	1.000	0.014	1	0.905

Wilk's lambda tests the significance of the Eigen-value for each discriminate function. In Table 5.15, the Chi-square at 16 degrees of freedom is highly significant, indicating

that the function is discriminating. The lambda value is inversely proportional to the canonical correlation, the threshold for Wilk's lambda is 0.5; thus, the obtained results are appropriate.

Table 5.16: Model-2: Standardised Canonical Discriminant Function Coefficients

Labels		Function			
		1	2	3	4
A	Top management plays a key part in "knowledge creation".	0.209	0.600	0.041	0.875
B	Continual learning (e.g. workshops, seminars, home-study or online courses, conferences), tends to achieve better "understanding and interpreting the knowledge".	0.431	-0.819	0.623	-0.023
C	Employee empowerment contributes to the "evaluate and check the knowledge process".	0.301	0.646	0.377	-0.667
D	Storing and sharing the knowledge (e.g. document repositories and management systems, databases) plays an important part in realising the "remembering and identification of knowledge".	0.550	-0.086	-0.892	-0.064

The standardised discriminate function coefficients in Table 5.16 indicates relative importance of the independent variables in predicting the dependent variable (DV): *organisational learning contributes to the "apply/implement the knowledge stages"*.

The Standardised Discriminate Function

$$DV = 0.209A + 0.431B + 0.301C + 0.550D$$

As only the first function is relevant, based on the test results (Wilk's Lambda), the discriminate function is created for only the first function presented in Table 5.6.

It can be concluded, from the above analyses, that the result for the *"effect of KM factors on the learner performance to reach or achieve the (learning process) theory"* demonstrated that most of the respondents indicated an agreement toward: *continuous learning plays an important part in "understanding and interpreting the knowledge"* and *storing and sharing plays an important part in realising the "remembering and identification of knowledge".*

Model-3 – The effect of sharing knowledge management with e-learning factors on the learner performance to achieve the New Bloom's Taxonomy (learning process), remember/identity category.

- **Dependent Variable**
    - "E-learning course quality" has a positive effect on continual learning.

This variable is a category variable, hence discriminate analysis was used. The categories included: No Influence, Low Influence, Medium Influence, High Influence, Very High Influence.

- **Independent Variables**
    - Top management has a positive effect on "programme flexibility".
    - "Programme flexibility" has an effect on top management.
    - Employee empowerment positively affects "computer training".

- "Computer training" positively affects "employee empowerment".
- "Computer self-efficacy" has a positive effect on organisational learning.
- Organisational learning positively affects "computer self-efficacy.
- "Attitude towards e-learning" can affect organisational learning.
- Organisational learning can affect "attitude towards e-learning".
- Continual learning has a positive effect on the "e-learning course quality".
- "Perceived usefulness" has a positive effect on storage and sharing the knowledge.
- Storage and sharing the knowledge has an effect on "perceived usefulness".

Table 5.17: Model-3: Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		133	100.0
Excluded	Missing or out-of-range group codes.	0	0.0
	At least one missing discriminating variable.	0	0.0
	Both missing or out-of-range group codes and at least one missing discriminating variable.	0	0.0
	Total	0	0.0
Total		133	100.0

Responses were collected from a total of 133 respondents. The analysis case processing summary (see Table 5.17) displays that there were zero missing and no invalid responses. But, all of these responses were considered for analysis.

Table 5.18: Model-3: Eigen-Values

Function	Eigen-Value	% of Variance	Cumulative %	Canonical Correlation
1	3.830(a)	92.0	92.0	0.890
2	0.253(a)	6.1	98.1	0.449
3	0.053(a)	1.3	99.3	0.223
4	0.029(a)	0.7	100.0	0.167

The first four canonical discriminate functions were used in the analysis.

As can be seen in Table 5.18, the Eigen-value is 3.830, which indicates that variance in the dependent variable is explained by that function. High Eigen values are indicative that the function explains variation in the dependent variable to a large extent. The square of the canonical correlation is the percent of variation in the dependent discriminated by independents in analysis. For this data, the square of the canonical correlation is 0.89, i.e., the function explains 89% variance in the dependent variable.

The Eigen values for all of the functions, with the exception of 1, were insignificant. Therefore, only the first function will be considered for further analysis.

Table 5.19: Model-3: Wilk's Lambda

Test of Function(s)	Wilk's	Chi-Square	D_f.	Sig.

	Lambda			
1 through 4	0.153	233.060	44	0.000
2 through 4	0.737	37.770	30	0.156
3 through 4	0.924	9.847	18	0.937
4	0.972	3.500	8	0.899

Wilk's lambda tests the significance of the Eigen-value for each discriminant function. In Table 5.19, the Chi-square at 44 degrees of freedom was recorded, this is highly significant indicating that the function is discriminating. The lambda value is inversely proportional to the canonical correlation, the threshold for the Wilk's lambda is 0.5. Moreover, the lower the value the better the model. Hence the results are appropriate.

Table 5.20: Model-3: Standardised Discriminate Function

Labels		Function			
		1	2	3	4
A	Top management has a positive effect on "programme flexibility".	-0.023	0.223	0.161	0.503
B	"Programme flexibility" has an effect on top management.	0.172	0.584	-0.032	0.303
C	Employee empowerment affects positively "computer training".	0.189	-0.007	-0.170	-0.442
D	"Computer training" affects positively employee empowerment.	0.322	-0.086	0.143	0.023
E	"Computer self-efficacy" has a positive effect on the organisational learning.	0.061	0.375	-0.165	-0.573
F	Organisational learning positively affects "computer self-efficacy".	-0.129	0.327	0.578	0.703

G	"Attitude towards e-learning" can effect organisational learning.	0.110	0.228	-0.454	-0.282
H	Organisational learning can have an effect on "attitude towards e-learning".	0.432	-0.381	-0.307	-0.171
I	Continual learning has a positive effect on the "e-learning course quality".	0.255	-0.605	-0.563	0.461
J	"Perceived usefulness" has a positive effect on storage and sharing the knowledge.	-0.144	-0.110	0.795	-0.443
K	Storage and sharing the knowledge has an effect on "perceived usefulness".	0.485	-0.328	0.320	0.041

The standardised discriminate function coefficients presented in Table 5.20 indicates the relative importance of the independent variables in predicting the dependent variable (DV): *"E-learning course quality" has a positive effect on continual learning*.

The Standardised Discriminate Function

$$DV = -0.023A + 0.172B + 0.189C - 0.061E - 0.129E - 0.111G + 0.432H + 0.255I - 0.144J + 0.485K$$

As only the first function is relevant, based on the test results (Wilk's Lambda), the discriminate function is created for only the first function from Table 5.20.

With regards to Model-3, it is possible to conclude that the results from the analyses concerning the *"remember/identity"* category, *organisational learning can have effect on "attitude towards e-learning"* by 0.432, and *storage and sharing the knowledge has a positive effect on "perceived usefulness"* by 0.485.

These results indicate that these two aspects appeared to have a greater positive influence than the remaining factors in the group.

Model-4 – The effect of sharing knowledge management with e-learning factors on the learner performance to achieve the New Bloom's Taxonomy (learning process), understanding/summarising category.

- **Dependent Variable**
    - "Attitude towards EL" has a positive effect on organisational learning.

This variable is a category variable, hence discriminate analysis was used. The categories included: No Influence, Low Influence, Medium Influence, High Influence, Very High Influence.

- **Independent Variables**
    - Organisational learning can have an effect on "attitude towards e-learning".
    - "E-learning course quality contents" has a positive effect on continual learning.
    - Continual learning has an effect on "e-learning course quality contents".
    - "Perceived usefulness" has a positive effect on storage and sharing the knowledge.

- Storage and sharing the knowledge has an effect on "perceived usefulness".
- "Computer training" affects positively employee empowerment.
- Employee empowerment has an effect on "computer training".
- "Programme flexibility" has an effect on top management.
- Top management has a positive effect on "programme flexibility".
- Organisational learning has an effect on "computer self-efficacy".
- "Computer self-efficacy" has an effect on organisational learning.

Table 5.21: Model-4: Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		132	100.0
Excluded	Missing or out-of-range group codes.	0	0.0
	At least one missing discriminating variable.	0	0.0
	Both missing or out-of-range group codes and at least one missing discriminating variable.	0	0.0
	Total	0	0.0
Total		132	100.0

Responses were collected from a total of 132 respondents. The analysis case processing summary, in Table 5.21, displays that there were no missing or invalid responses. Hence, all 132 responses were considered for analysis.

Table 5.22: Model-4: Eigen-Values

Function	Eigen-Value	% of Variance	Cumulative %	Canonical Correlation
1	6.482(a)	95.1	95.1	0.931
2	0.153(a)	2.2	97.4	0.364
3	0.137(a)	2.0	99.4	0.347
4	0.042(a)	0.6	100.0	0.202

The first four canonical discriminate functions were used in the analysis.

In the given Table 5.22, the Eigen-value of 6.482 was obtained, this indicates that variance in the dependent variable is explained by that function. High Eigen values are indicative that the function explains variation in the dependent variable to a large extent. The square of the canonical correlation is the percent of variation in the dependent discriminated by independents in analysis. For the data, the square of the canonical correlation is 0.931; meaning that the function explains 93.1% variance in the dependent variable.

The Eigen values for all of the functions, except 1, were insignificant. Thus, only the first function will be considered for further analysis.

Table 5.23: Model-4: Wilk's Lambda

Test of Function(s)	Wilk's Lambda	Chi-Square	Df.	Sig.
1 through 4	0.098	285.931	44	0.000
2 through 4	0.732	38.397	30	0.140
3 through 4	0.844	20.879	18	0.286
4	0.959	5.113	8	0.745

The Wilk's lambda tests the significance of the Eigen-value for each discriminant function. In Table 5.23, the Chi-square at 44 degrees of freedom was recorded, this is highly significant indicating that the function is discriminating. The lambda value is inversely proportional to the canonical correlation, the threshold for which is 0.5 for Wilk's lambda. Moreover, the lower the value the better the model; hence, the results are appropriate.

Table 5.24: Model-4: Standardised Discriminant Function

Labels		Function			
		1	2	3	4
A	Organisation learning can affect the "attitude towards e-learning".	0.387	-0.628	-0.049	-0.106
B	"E-learning course quality contents" can have a positive effect on continual learning.	0.239	-0.088	-0.520	0.122
C	Continual learning effects "e-learning course quality contents".	0.293	-0.088	-0.187	0.146
D	"Perceived usefulness" has a positive effect on storage and sharing the knowledge.	-0.055	0.232	0.630	0.735
E	Storage and sharing the knowledge has an effect on	0.188	-0.502	0.331	-0.038

	"perceived usefulness".				
F	"Computer training" affects employee empowerment.	0.270	0.074	0.318	-0.643
G	Employee empowerment has an effect on "computer training".	-0.007	-0.014	-0.202	0.073
H	"Programme flexibility" has an effect on the top management.	-0.091	0.131	0.545	-0.096
I	Top management has a positive effect on "programme flexibility".	0.261	0.311	0.067	-0.248
J	Organisational culture has a positive effect on "computer self-efficacy".	0.142	0.043	-0.510	0.677
K	"Computer self-efficacy" has an effect on organisational culture.	0.266	0.652	-0.276	-0.386

The standardised discriminate function coefficients, in Table 5.24, indicate the relative importance of the independent variables in predicting the dependent variable (DV): *"attitude towards e-learning" has a positive effect on organisational learning*.

The Standardised Discriminate Function

$$DV = 0.383A + 0.293B - 0 + 0.293C - 0.055D + 0.188E + 0.270F - 0.007G$$
$$- 0.091H + 0.261I + 0.142J + 0.266K$$

As only the first function is relevant, based on the test results (Wilk's Lambda), the discriminant function is created only for the first function from Table 5.24.

From the analyses above, it is possible to conclude that with regards to the *"understanding/summarising"* category, *organisation learning can affect "attitude towards e-learning"* by 0.387 and *continual learning has an effect on "e-learning course quality contents"* by 0.293.

Thus, it appears, based on these results, that these factors have a greater positive influence than the remaining factors in the group.

Model – 5 - The effect of sharing knowledge management with e-learning factors on the learner performance to achieve the New Bloom's Taxonomy (learning process), applying/implementation category

- **Dependent Variable**
    - Attitude towards e-learning positively affects organisational learning.

This variable is a category variable, hence discriminate analysis was used. The categories included: No Influence, Low Influence, Medium Influence, High Influence, Very High Influence.

- **Independent Variables**
    - "Perceived usefulness "has a positive effect on storage and sharing the knowledge.
    - Storage and sharing the knowledge has an effect on "perceived usefulness".

- "Computer training" affects positively on employee empowerment.
- Employee empowerment has an effect on "computer training".
- Organisational learning can affect "attitude towards e-learning".
- "Programme flexibility" has an effect on top management.
- Top management has an effect on "programme flexibility".
- Continual learning has an effect on "e-learning course quality".
- "E-learning course quality contents" affect positively on continual learning.
- Employee empowerment has an effect on "Computer training".
- "Computer training" has a positive effect on employee empowerment.

Table 5.25: Model-5: Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		132	100.0
Excluded	Missing or out-of-range group codes.	0	0.0
	At least one missing discriminating variable.	0	0.0
	Both missing or out-of-range group codes and at least one missing discriminating variable.	0	0.0
	Total	0	0.0
Total		132	100.0

Responses were collected from a total of 132 respondents. The analysis case processing summary, presented in Table 5.25, displays that there were no missing or invalid responses; hence, all of the responses were considered for the analysis.

Table 5.26: Model-5: Eigen-Values

Function	Eigen-Value	% of Variance	Cumulative %	Canonical Correlation
1	3.216(a)	84.8	84.8	0.873
2	0.329(a)	8.7	93.5	0.498
3	0.195(a)	5.2	98.7	0.404
4	0.051(a)	1.3	100.0	0.220

The first four canonical discriminate functions were used in the analysis.

In Table 5.26, given above, the Eigen-value of 3.216 is presented, which indicates that variance in the dependent variable is explained by that function. High Eigen values are indicative that the function explains variation in the dependent variable to a large extent. The square of the canonical correlation is the percent of variation in the dependent discriminated by independents in analysis. For this data, the square of the canonical correlation is 0.873; thus, the function is explaining 87.3% variance in the dependent variable.

The Eigen values for all of the functions, with the exception of the first, were insignificant. Therefore, only the first function will be considered for further analysis.

Table 5.27: Model-5: Wilk's Lambda

Test of Function(s)	Wilk's Lambda	Chi-Square	D_f.	Sig.
1 through 4	0.142	240.021	44	0.000
2 through 4	0.599	63.051	30	0.000
3 through 4	0.796	28.070	18	0.061
4	0.952	6.111	8	0.635

Wilk's lambda tests the significance of the Eigen-value for each discriminate function. As can be seen in Table 5.27, the Chi-square at 44 degrees of freedom is highly significant indicating that the function is discriminating. The lambda value is inversely proportional to the canonical correlation, at a threshold of 0.5 for Wilk's lambda. Moreover, the lower the value the better the model. Hence the results are appropriate.

Table 5.28: Model-5: Standardised Discriminate Function

Labels		Function			
		1	2	3	4
A	"Perceived usefulness" has a positive effect on storage and sharing the knowledge.	0.173	0.687	0.200	0.641
B	Storage and sharing the knowledge has an effect on "perceived usefulness".	0.067	-0.441	0.096	0.026
C	"Computer self-efficacy affects positively organisational culture.	0.037	-0.294	-0.077	-0.607
D	Organisational culture has an effects on "computer self-efficacy".	0.131	0.346	-0.202	0.244
E	Organisational learning can have an effect on "attitude towards e-learning".	0.215	-0.300	-0.239	-0.303

Labels		Function			
		1	2	3	4
F	"Programme flexibility" has an effect on top management.	0.170	0.499	0.009	-0.311
G	Top management has an effect on "programme flexibility".	0.193	-0.526	-0.636	0.654
H	Continual learning has an effect on "e-learning course quality".	-0.044	0.338	-0.568	-0.211
I	"E-learning course quality contents" affect continual learning.	0.208	0.342	0.689	0.199
J	Employee empowerment has an effect on "computer training".	0.247	-0.207	-0.188	-0.348
K	"Computer training" has a positive effect on employee empowerment.	0.197	-0.337	0.979	0.076

The standardised discriminate function coefficients, in Table 5.28, indicate the relative importance of the independent variables in predicting the dependent variable (DV): *"attitude towards e-learning" affects organisational learning.*

The Standardised Discriminate Function

$$DV = 0.173A + 0.067B + 0.037C + 0.131D + 0.215E + 0.170F + 0.193G - 044H + 0.208I + 0.247J + 0.197K$$

As only the first function is relevant, based on the test results (Wilk's lambda), the discriminate function is created for only the first function (see Table 5.28).

The results indicate that for the *"applying/implantation"* category, *"employee empowerment has an effect on "computer training"* by 0.247 and *organisational learning can have an effect on "attitude towards e-learning"* by 0.215.

It appeared from the analyses that these factors have relatively higher influence when considered against the other factors in the category. However, it should be noted that even though there is a difference it is not very significant.

Model – 6 - The effect of sharing knowledge management with e-learning factors on the learner performance to achieve the New Bloom's Taxonomy (learning process), analysis/organising category

- **Dependent Variable**
    - "Attitude towards e-learning" effects organisational learning.

This variable is a category variable, hence discriminate analysis was used. The categories included: No Influence, Low Influence, Medium Influence, High Influence, Very High Influence.

- **Independent Variables**
    - Employee empowerment has an effect on "computer training".
    - "Computer training" affects employee empowerment positively.
    - "E-learning course quality contents" have an effect on continual learning.

- Continual learning has an effect on “e-learning course quality”.
- Top management has an effect on “programme flexibility”.
- “Programme flexibility” affects top management positively.
- Organisational learning effects “attitude towards e-learning”.
- Storage and sharing the knowledge effects “perceived usefulness”.
- “Perceived usefulness” has a positive effect on storage and sharing knowledge.
- “Computer self-efficacy” has an effect on organisational culture.
- Organisational culture positively affects “computer self-efficacy”.

Responses were collected from a total of 133 respondents. The analysis case processing summary, presented in Table 5.29, displays that there were no invalid responses. Hence, all of the responses were considered for further analysis.

Table 5.29: Model-6: Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		133	100.0
Excluded	Missing or out-of-range group codes.	0	0.0
	At least one missing discriminating variable.	0	0.0
	Both missing or out-of-range group codes and at least one missing discriminating variable.	0	0.0
	Total	0	0.0
Total		133	100.0

Table 5.30: Model-6: Eigen-Values

Function	Eigen-Value	% of Variance	Cumulative %	Canonical Correlation
1	5.855(a)	93.2	93.2	0.924
2	0.272(a)	4.3	97.5	0.463
3	0.122(a)	1.9	99.4	0.330
4	0.035(a)	.6	100.0	0.183

The first four canonical discriminate functions were used in the analysis.

The Eigen-value of 5.855 is presented in Table 5.30, this indicates that the variance in the dependent variable is explained by that function. High Eigen values are indicative that the function explains variation in the dependent variable to a large extent. The square of the canonical correlation is the percent of variation in the dependent discriminated by the independents in analysis. For this data, the square of canonical correlation is 0.924; thus, the function explains 92.4% variance in the dependent variable.

The Eigen values for all of the functions, with the exception of function 1, were insignificant; therefore, only function 1 will be considered for further analysis.

Table 5.31: Model-6: Wilk's Lambda

Test of Function(s)	Wilk's Lambda	Chi-Square	Df.	Sig.
1 through 4	0.099	287.135	44	0.000
2 through 4	0.677	48.439	30	0.018
3 through 4	0.861	18.569	18	0.419
4	0.966	4.242	8	0.835

Wilk's lambda tests the significance of the Eigen value for each discriminant function. In Table 5.31, the Chi-square at 44 degrees of freedom was recorded, this is highly significant indicating that the function is discriminating. The lambda value is inversely proportional to the canonical correlation, the threshold for the Wilk's lambda is 0.5. Moreover, the lower the value, the better the model; hence, the obtained results are appropriate.

Table 5.32: Model-6: Standardised Discriminant Function

Labels		Function			
		1	2	3	4
A	Employee empowerment has an effect on "computer training".	0.584	-0.535	-0.510	-0.209
B	"Computer training" affects positively on employee empowerment.	-0.114	0.123	0.036	-0.431
C	"E-learning course quality contents" has an effect on continual learning.	-0.053	0.299	-0.003	0.417
D	Continual learning has an effect on "e-learning course quality".	-0.536	-0.094	0.316	-0.594
E	Top management has an effect on "programme flexibility".	0.443	-0.433	0.261	0.288
F	"Programme flexibility" affects positively on top management.	0.139	0.895	-0.099	-0.081
G	Organisational learning effects "attitude towards e-learning".	0.125	0.398	-0.608	0.391
H	Storage and sharing knowledge effects "perceived usefulness".	0.527	-0.490	0.712	0.028
I	"Perceived usefulness" has a positive effect on storage and sharing the knowledge.	-0.266	0.489	-0.398	0.535
J	"Computer self-efficacy" has an effect on organisational culture.	0.116	0.208	0.518	-0.700
K	Organisational culture positively affects "computer self-efficacy".	0.558	-0.450	0.475	0.383

The standardised discriminant function coefficients in Table 5.32 indicate the relative importance of independent variables in predicting the dependent variable (DV): *"attitude towards e-learning" effects organisational learning*.

The Standardised Discriminant Function

$$DV = 0.584A - 114B - 0.053C - 0.536D + 0.443E + 0.139F + 0.125G + 0.527H - 0.226I + 116J + 0.558K$$

As only the first function is relevant, based on the test results (Wilk's lambda), the discriminate function is created for only the first function from Table 5.32.

The results for the *"analysis/organising"* category shows that *employee empowerment has an effect on "computer training"* by 0.584, , *storage and sharing knowledge has an effect on "perceived usefulness"* by 0.527, and *organisational culture affects positively "computer self-efficacy"* by 0.558. It appeared, from the analyses, that more factors had a strong positive influence, however the factor of *continual learning has an effect on "e-learning course quality"* appeared to have a negative influence by -0.536.

Model-7 – The effect of sharing knowledge management with e-learning factors on the learner performance to achieve the New Bloom's Taxonomy (learning process), evaluation category.

- **Dependent Variable**
    - "Attitude towards e-learning" effects organisational learning.

This variable is a category variable, hence discriminant analysis was used. The categories included: No Influence, Low Influence, Medium Influence, High Influence, Very High Influence.

- **Independent Variables**
    - "Computer self-efficacy" positively affects organisational culture.
    - Organisational culture has an effect on "computer self-efficacy".
    - Organisational learning effects "attitude towards e-learning".
    - "E-learning course quality contents" effect continual learning.
    - Continual learning effects "e-learning course quality".
    - "Perceived usefulness" effects storage and sharing the knowledge.
    - Storage and sharing the knowledge effects "perceived usefulness".
    - "Computer training" has a positive effect on employee empowerment.
    - Employee empowerment effects "computer training".
    - "Programme flexibility" effects top management.
    - Top management effects programme flexibility.

Table 5.33: Model-7: Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		133	100.0
Excluded	Missing or out-of-range group codes.	0	0.0
	At least one missing discriminating variable.	0	0.0
	Both missing or out-of-range group codes and at least one missing discriminating variable.	0	0.0
	Total	0	0.0
Total		133	100.0

Responses were collected from a total of 133 respondents. The analysis case processing summary, presented in Table 5.33, displays that there were no missing or invalid responses. Hence, all responses were considered for analysis.

Table 5.34: Model-7: Eigen-Values

Function	Eigen-Value	% of Variance	Cumulative %	Canonical Correlation
1	5.455(a)	87.4	87.4	0.919
2	0.445(a)	7.1	94.5	0.555
3	0.214(a)	3.4	97.9	0.420
4	0.128(a)	2.1	100.0	0.337

The first four canonical discriminate functions were used in the analysis.

With reference to Table 5.34, the Eigen-value is 5.455, which indicates that variance in the dependent variable is explained by that function. High Eigen values indicates that the function explains variation in the dependent variable to a large extent. The square of the canonical correlation is the percent of variation in the dependent discriminated by

the independents in analysis. For this data, the square of the canonical correlation is 0.919, thus the function explains 91.9% variance in the dependent variable.

The Eigen values for all of the functions, except 1, were insignificant; as a result, only function 1 will be considered for further analysis.

Wilk's lambda tests the significance of the Eigen-value for each discriminant function. Table 5.35 presents the Chi-square result of 44 degrees of freedom which is highly significant indicating that the function is discriminating. The lambda value is inversely proportional to the canonical correlation, the threshold for Wilk's lambda is 0.5. Moreover, the lower the value, the better the model; hence the obtained results are appropriate.

Table 5.35: Model-7: Wilk's Lambda

Test of Function(s)	Wilk's Lambda	Chi-Square	Df.	Sig.
1 through 4	0.078	315.870	44	0.000
2 through 4	0.505	84.629	30	0.000
3 through 4	0.730	38.976	18	0.003
4	0.886	14.961	8	0.060

Table 5.36: Model-7: Standardised Discriminate Function

Labels		Function			
		1	2	3	4
A	"Computer self-efficacy" positively affects organisational culture.	0.200	-0.539	0.250	-0.194
B	Organisational culture has an effect on "computer self-efficacy".	0.022	0.411	0.905	-0.660
C	Organisational learning effects "attitude towards e-learning".	0.459	0.136	0.035	0.394
D	"E-learning course quality contents" effect continual learning.	-0.088	-0.295	0.332	0.970
E	Continual learning effects "e-learning course quality".	0.188	-0.219	-0.412	-0.203
F	"Perceived usefulness" effects storage and sharing knowledge.	0.087	-0.032	0.307	0.257
G	Storage and sharing the knowledge effects "perceived usefulness".	-0.050	0.268	-0.348	-0.037
H	"Computer training" has a positive effect on employee empowerment.	0.110	-0.480	-0.618	-0.254
I	Employee empowerment effects "computer training".	0.322	0.298	0.293	-0.318
J	Programme flexibility effects top management.	0.295	-0.209	-0.184	0.102
K	Top management effects programme flexibility.	0.235	0.680	-0.529	0.140

The standardised discriminate function coefficients in Table 5.36 indicate the relative importance of independent variables in predicting the dependent variable (DV): *"attitude towards e-learning" effects organisational learning*.

The Standardised Discriminate Function

$$DV = 0.200A + 0.022B + 0.49C - 0.088D + 0.188E + 0.087F - 0.050G$$
$$+ 0.322H + 0.110I + 0.295J + 0.235K$$

As only the first function is relevant, based on the test results (Wilk's lambda), the discriminate function is created only for the first function in Table 5.36.

The results for the *"evaluation"* category found that *organisation learning effects "attitude towards e-learning"* by 0.459, and *employee empowerment effects "computer training"* by 0.322. These factors appeared to have a positive influence over the remaining factors in the group.

Model-8 – The effect of sharing knowledge management with e-learning factors on the learner performance to achieve the New Bloom's Taxonomy (learning process), creating/designing category.

- **Dependent Variable**
    - "Attitude towards e-learning" positively effects organisational learning.

This variable is a category variable, hence discriminate analysis was performed. The categories included: No Influence, Low Influence, Medium Influence, High Influence, Very High Influence.

- **Independent Variables**

- "E-learning course quality contents" positively affect continual learning.
- Continual learning effects "e-learning course quality".
- "Perceived usefulness" has an effect on storage and sharing the knowledge.
- Storage and sharing the knowledge effects "perceived usefulness".
- "Computer training" affects employee empowerment positively.
- Employee empowerment has an effect on "computer training".
- Organisational learning effects "attitude towards e-learning".
- Organisational culture effects "computer self-efficacy".
- "Computer self -efficacy" has a positive effect on organisational culture.
- Top management effects "programme flexibility".
- "Programme flexibility" has an effect on top management.

Table 5.37: Model-8: Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		133	100.0
Excluded	Missing or out-of-range group codes.	0	0.0
	At least one missing discriminating variable.	0	0.0
	Both missing or out-of-range group codes and at least one missing discriminating variable.	0	0.0
	Total	0	0.0
Total		133	100.0

Responses were collected from a total of 133 respondents. The analysis case processing summary (see Table 5.37) displays that there were zero missing or invalid responses; hence, all of the responses were considered for analysis.

Table 5.38: Model-8: Eigen-Values

Function	Eigen-Value	% of Variance	Cumulative %	Canonical Correlation
1	4.567(a)	93.1	93.1	0.906
2	0.200(a)	4.1	97.2	0.408
3	0.089(a)	1.8	99.0	0.286
4	0.047(a)	1.0	100.0	0.212

The first four canonical discriminate functions were used in the analysis.

As can be seen in Table 5.38, the Eigen value is 4.567, which indicates that the variance in the dependent variable is explained by that function. High Eigen values are indicative that the function explains variation in the dependent variable to a large extent. The square of the canonical correlation is the percent of variation in the dependent

discriminated by the independents in analysis. For this data, the square of canonical correlation is 0.906, thus the function is explaining 90.6% variance in the dependent variable.

The Eigen values for all of the functions, with the exception of 1, were insignificant; therefore, only the first function will be considered for further analysis.

Table 5.39: Model-8: Wilk's Lambda

Test of Function(s)	Wilk's Lambda	Chi-Square	Df.	Sig.
1 through 4	0.131	251.840	44	0.000
2 through 4	0.730	38.958	30	0.127
3 through 4	0.877	16.324	18	0.570
4	0.955	5.707	8	0.680

Wilk's lambda tests the significance of the Eigen-value for each discriminant function. In Table 5.39, the Chi-square at 44 degrees of freedom is highly significant indicating that the function is discriminating. The lambda value is inversely proportional to the canonical correlation, the threshold is 0.5 for the Wilk's lambda. Moreover, the lower the value, the better the model; hence, the obtained results are appropriate.

Table 5.40: Model-8: Standardised Discriminate Function

Labels		Function			
		1	2	3	4
A	"E-learning course quality contents" positively affect continual learning.	0.093	0.424	0.040	-0.076
B	Continual learning effects "e-learning course quality".	-0.170	-0.814	0.404	-0.179
C	"Perceived usefulness" has an effect on storage and sharing the knowledge.	0.183	0.418	-0.230	-0.502
D	Storage and sharing the knowledge affects "perceived usefulness".	-0.135	0.260	-0.121	1.026
E	"Computer training" affects positively employee empowerment.	0.105	0.300	0.778	-0.208
F	Employee empowerment has an effect on "computer training".	-0.054	0.021	-0.114	-0.006
G	Organisational learning effects "attitude towards e-learning".	0.289	0.570	-0.361	-0.154
H	Organisational culture effects "computer self-efficacy".	.0280	0.336	-0.103	0.225
I	"Computer self-efficacy" has a positive effect on organisational culture.	0.190	-0.499	-0.753	-0.494
J	Top management effects "programme flexibility".	0.508	-0.696	-0.102	0.367
K	"Programme flexibility" has an effect on top management.	0.299	-0.155	0.605	0.181

The standardised discriminate function coefficients in Table 5.40 indicate the relative importance of the independent variables in predicting the dependent variable (DV): *"attitude towards e-learning" positively effects organisational learning*.

The Standardised Discriminate Function

$$DV = 0.093A - 0.170B + 0.183C - 0.135D + 0.508E - 0.054F + 0.289G + 0.280H + 0.190I + 0.105J + 0.299K$$

As only the first function is relevant, based on the test results (Wilk's lambda), the discriminate function is created for only the first function presented in Table 5.40.

The analysis shows that for the *"creating/designing"* category, the *top management affects "programme flexibility"* by 0.508, this had a greater positive influence than any of the remaining factors in the group.

5.9 Summary

In terms of the utilisation of the evaluation method, the researcher can conclude the following findings. Firstly, there are clearly some critical factors of EL that help to achieve the New Bloom's Taxonomy theory (learning process), and therefore influence learner performance in Saudi higher education. This includes the notion that *computer self-efficacy* can be used to lead and support the students to improve their capability to use computers to obtain and evaluate knowledge. The second factor was *computer training* which can be used to break the information into parts to explore understanding

and to organise the knowledge, this could increase learner specialism in terms of instruction and practice, and increase the learner's talents which could help to lead them to analyse the knowledge.

Secondly, there were some factors of KM that have an effect on learner performance to achieve the learning process in Saudi higher education. The results showed the effect of *continuous/continual learning* to improve learner skills which can lead to self-direction on the individual level, to involve providing opportunities and establishing structures and processes that support learning and exploration on the organisational level. Ultimately, this will help to reach the understanding of the knowledge in terms of storing and sharing the knowledge which can further improve the ability to share and improve upon the knowledge and the experience. Thus, knowledge to achieve, and the remembering and identifying the knowledge, were the two factors that most of the respondents demonstrated agreement over.

Thirdly, this research indicates that the integration of KM and EL CSFs, to support learner performance in developing countries (such as Saudi Arabia), in line with Bloom's taxonomy theory, found some significant factors that could increase learning performance. Comparison of these findings with the studies presented in the literature review confirms that there are clearly strong relationships between the New Bloom's Taxonomy and the integration of factors from both of the system. To illustrate, the results concerning the first category: *remembering/identify the knowledge* of the learning process theory, acknowledged a positive effect on the integration of KM and EL CSFs.

Specifically, this should include that *organisational learning can have an effect on "attitude towards e-learning"* and *"perceived usefulness" has a positive effect on storage and sharing the knowledge*. Both of these factors appeared to have a greater positive influence than the remaining factors in the group. In addition, with regards to the second category: *understanding and summarising the knowledge*, it was noted that *organisational learning can affect "attitude towards e-learning"* and *"programme flexibility" has an effect on top management"* both appeared to have a greater positive influence than the remaining factors in the group. This finding confirms that this level of the learning process theory is associated with the effect of the integration between KM and EL CSFs. Another important finding found that in the third level of New Bloom's Taxonomy, for the category *applying/implantation*, it was noted that *employee empowerment had an effect on "computer training"* and *"computer training" had a positive effect on employee empowerment,* appeared to have relatively higher influences when considered against the other factors in this category. However, it should be noted that despite there being a difference, this difference cannot be deemed to be very significant. Furthermore, in terms of the fourth level of Bloom's Taxonomy, for the *analysis/organising* category. It was noted that *"computer training" affected positively employee empowerment*, *top management had an effect on "programme flexibility"*, *"perceived usefulness" had a positive effect on storage and sharing the knowledge"*, and *organisational culture had a positive effect on "computer self-efficacy",* all appeared to have a strong positive influence. It is also worth noting that *"continual*

learning has an effect on "e-learning course quality" appeared to have a negative influence.

Furthermore, in terms of the fifth level of New Bloom's Taxonomy, the *evaluation* category, *organisational learning affects "attitude towards e-learning"* and *"computer training" has a positive effect on employee empowerment"* appeared to influence the implementation of *evaluation/classify* the knowledge. Thus, these two factors appeared to have a positive influence over the remaining factors in the group. Finally, in terms of the final level of New Bloom's Taxonomy, the *creating/designing* category, it was found that the effect of *"computer training" on employee empowerment* led to creating and generating the knowledge.

Chapter 6: Discussion of Key Findings

6.1 Introduction

This chapter will provide a comprehensive discussion of the findings from this study. The literature review identified and explored the different research studies that had been conducted into the integration of aspects of KM and EL (CSFs) to achieve learner performance to achieve the New Bloom's Taxonomy. As such, the researcher gained an understanding of the critical factors, for both systems, that affect not only learner performance but that also support and improve the success of New Bloom's Taxonomy theory. The results of this study indicate that the challenges facing educational institutions in developing countries could be resolved with the integration and implementation of various significant CSFs for both EL and KM, in order to achieve and increase learner performance within higher education institutions in developing countries such as Saudi Arabia.

Knowledge management and e-learning are relatively new concepts that have gained popularity and credibility, in recent years, as effective management tools. This research focused on respondents that were aged between 25 and 60 years; the participants were grouped into one of three are groups: 60% were aged between 25-35 years, 32% were aged between 35-45, and the remaining were aged between 45-60 years.

6.1.1 First Hypothesis

Within the New Boom's Taxonomy Framework, there are EL factors that can contribute towards improved learner performance.

The results show that the majority of the respondents were in agreement that the EL factors of *computer training* and *computer self-efficacy* were deemed to have positive effect on improving learner performance within the New Bloom's Taxonomy framework. As mentioned in the literature review, *computer self-efficacy* play an important role in supporting the students to improve their capability to use computers and IT; nonetheless, the literature review identified several difficulties associated with the use of EL in developing countries, such as Saudi Arabia. These difficulties are associated with: technical problems included difficulty of access, slow browsing especially at peak times, lack of maintenance and security vulnerability causing many problems as well as the loss of data. These problems could be outside of the university's control as they could be associated with poor public networks, or they could be linked to issues concerning limited learner skills in dealing with EL (Algahtani, 2011).

However, this result supports the notion that the effect of implementation of the factor of *computer self-efficacy* leads to reaching the fifth level of New Bloom's Taxonomy theory (*evaluate the knowledge*) by 0.560, since the evaluation of knowledge that is associated with the EL factor of *computer self-efficacy* helps the students to improve their performance. In addition, the results show that *computer training* has an effect on the ability of the student to distinguish between the different parts of the knowledge

(*analyse*) by 0.571. The areas in which these two factors affect learner performance on New Bloom's Taxonomy are reflected on Figure 6.1 below. Consequently, this contributes to increasing the amount of specialised instruction and practice that is afforded to the learner to increase their proficiency in utilising a computer's capabilities. This outcome shows that in this study there is a strong relationship between the attitudes expressed about the use of these two factors and the requirement of the hypothesis to approve it. It is also important to note that only low effects were noted for the rest of the factors associated with learner performance to achieve the other levels of the New Bloom's Taxonomy theory.

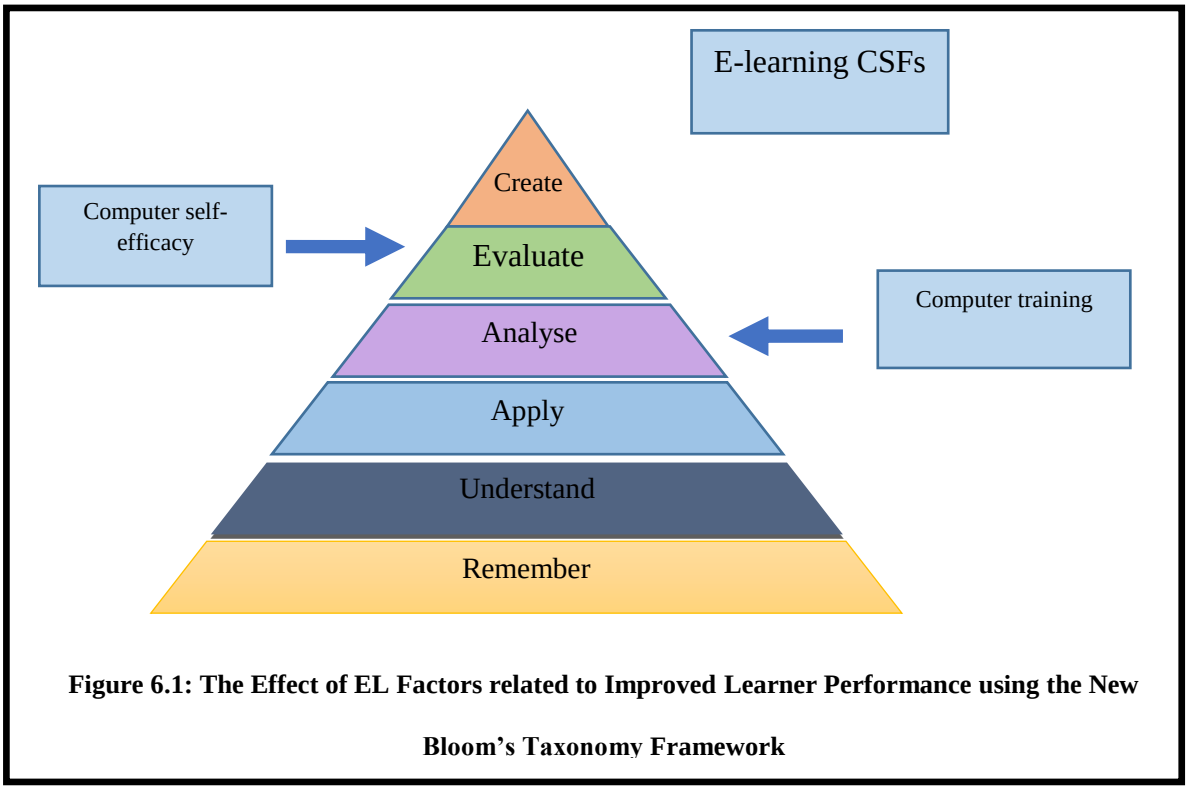


Figure 6.1: The Effect of EL Factors related to Improved Learner Performance using the New Bloom's Taxonomy Framework

6.1.2 Second Hypothesis

Using the same Bloom's Taxonomy Framework, KM factors can positively influence learner performance.

The results show that the majority of the respondents expressed their agreement towards the KM factors of *continuous/continual learning* and *storing and sharing the knowledge* as having positive effect on improving learner performance using the Learning Process Theory. As mentioned in the literature review, *storing and sharing the knowledge* plays an important role in supporting the students to share their knowledge and in generating more involvement of the end users (Skyrme and Amidon, 1997). The result show that the effect of this factor on learner performance was 0.550; thus, there was a strong link between the *storing and sharing the knowledge* factor and the first level of the learning process, *remembering/realising the knowledge*. This factor is clearly important for students as it will help to result in the remembrance and sharing of knowledge (Bryson et al., 2014). *Continual learning* is the other significant factor for KM, specifically this element was identified as playing an essential and effective role in learner performance by 0.431. The results show that effective *continual learning* can improve learner skills – this should provide elements for self-directed or individual learning, as well as the provision of opportunities and established structures and processes that support learning and exploration across the organisational level in order to reach the understanding that knowledge will lead to develop the learner's *understanding* of knowledge. To illustrate, learners should develop continuous interests to learn and seek knowledge, not just for

the purpose of gaining immediate results but for the purpose of developing a lifelong habit. Consequently, this not only results in enhancing the knowledge skills of the learners, but it also make them *understand* knowledge in terms of it being a process of continual learning (Maehr, 2012). This outcome clearly shows that in this study there is a relationship between the approaches of implementing the KM factors and achieving the New Bloom's Taxonomy theory which was the requirement of the hypothesis to approve it. It is noteworthy that only low effect levels were noted for the rest of the factors associated with learner performance for the other levels of New Bloom's Taxonomy theory. However, a strong relationship between the New Bloom's Taxonomy theory levels of *understand* and *remember* were associated with the KM factors of *continual learning* and *storing and sharing the knowledge* – both of which influence the development of learner capabilities and performance (see Figure 6.2).

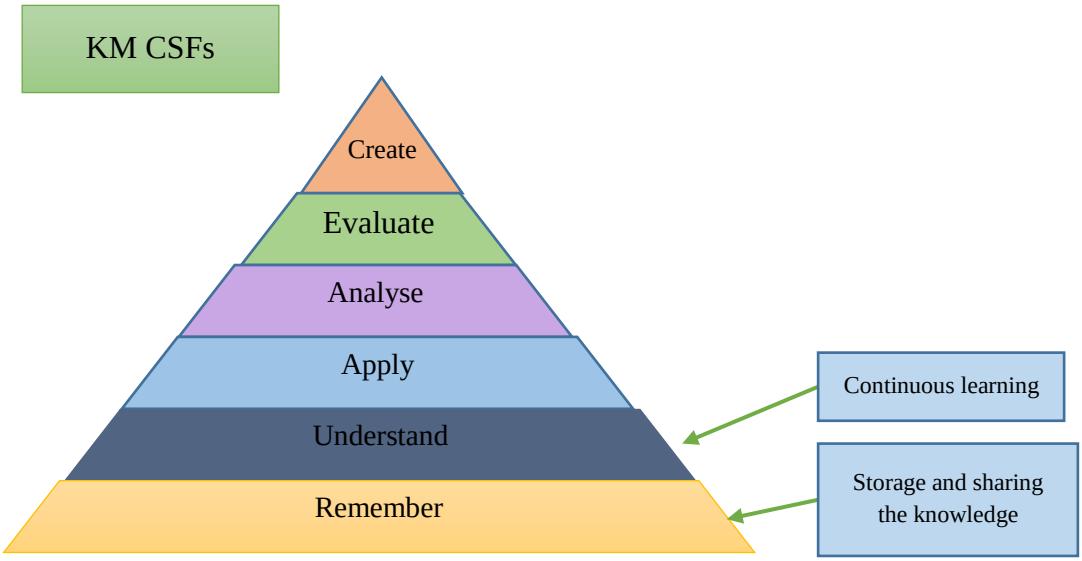


Figure 6.2: The Effect of KM Factors related to Improved Learner Performance using the New Bloom's Taxonomy Framework

6.1.3 Third Hypothesis

There is a link between the KM and EL factors; such a link can have positive impact on the learner's performance, based on the New Bloom's Taxonomy Framework. This can be categorised as:

The respondents were asked about various factors which they believed influence the effect of sharing KM with EL on learner performance, through New Bloom's Taxonomy, these will now be discussed below.

6.1.3.1 Towards the "Remember/Identity" Category

The result indicate that *storage and sharing knowledge* was found to have a positive effect on *perceived usefulness* by 0.485; this value proves that there was a significant

effect between these factors to help the learner to *remember/identify* the knowledge. According to Scheg (2014), distance EL courses require active learning. Knowledge sharing among the students is a part of daily routine and a step towards the KM lifecycle. Knowledge transfer takes place from groups of students to individuals and also between individuals. Active learning is based upon the principle that the students in the process should actively participate in the learning process, rather than them simply reading books or listening to lectures. Thus, EL is beneficial as long as it has *perceived usefulness* (efficacy and compatibility) as this will lead the learners to *remember* the knowledge (Scheg, 2014). The *storage and sharing of knowledge* among the students ultimately results in the *remembrance* of knowledge among them; this whole process is facilitated by the technologies that exist within the organisation (Bryson et al., 2014). In addition, *organisational learning* was recorded as having an effect on *attitude towards e-learning* by 0.432.

The most interesting finding in this study is the level of recognising and *identifying* the knowledge that the students can reach through organisational learning; to illustrate, organisational learning can have an effect on the attitude towards EL by increasing the efficiency in teaching, and by increasing access to education and training by affecting the *attitude towards e-learning* (Jan et al., 2012). Thus, EL and KM factors when combined can help to obtain the *remember* level of New Bloom's Taxonomy theory (see Figure 6.3).

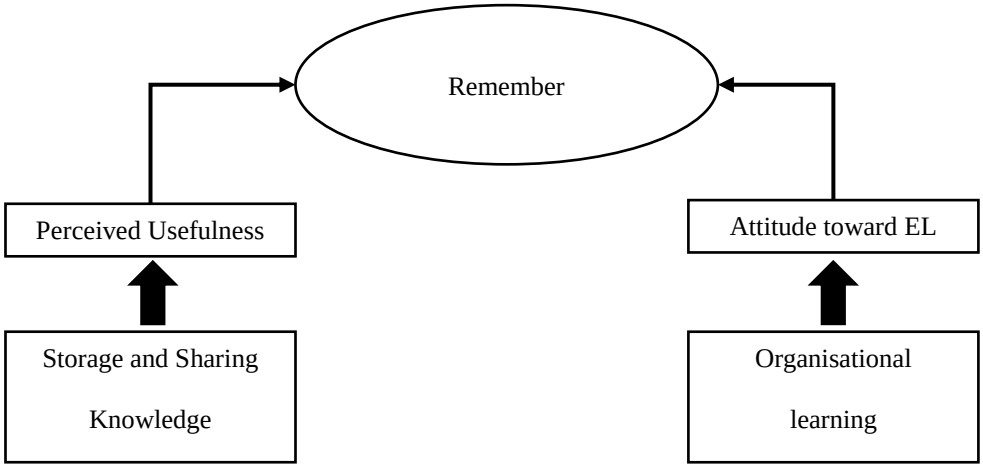


Figure 6.3: The Effect of the Integration Between EL and KM Factors to Achieve the (Remember/Identity) Level

6.1.3.2 Towards the "Understanding/Summarising" Category

Continual learning was recorded as having an effect on *EL course quality contents* by 0.293 for reaching the level of *summarising/understanding* the knowledge. As already mentioned, learners should develop a continuous interest to learn and seek knowledge, not just for the purpose of gaining immediate results but for the purpose of developing a lifelong habit of learning. This should not only result in enhancing the knowledge skills of the learners, but it will also make them *understand* the knowledge within an approach to *continual learning* (Maehr, 2012).

It is worth noting that the development of the *EL course quality factors* contributes to the openness of the learners towards the wider community, especially for higher education where the learners have continually growing needs and demands. All these factors contribute to the *understanding* of the knowledge by the learners

(Volungeviciene, Zuzeviciute and Butrime, 2008); these learners are not only able to learn but they can also develop new interests, gain new competencies and acquire useful skills.

The need for learning by the learners comprises of quality criteria of any kind of EL course that leads to *understanding* of the knowledge. Furthermore, *organisational learning* was noted as having an effect on *attitude towards e-learning* by 0.387. Thus, it is important to increase the efficiency in teaching, increase access to education and training by focusing on the *attitude towards e-learning* (Jan et al., 2012). With regards to these findings, the way in which the KM and EL factors contribute together to the New Bloom's Taxonomy theory/category of *understanding the knowledge* are summarised below in Figure 6.4.

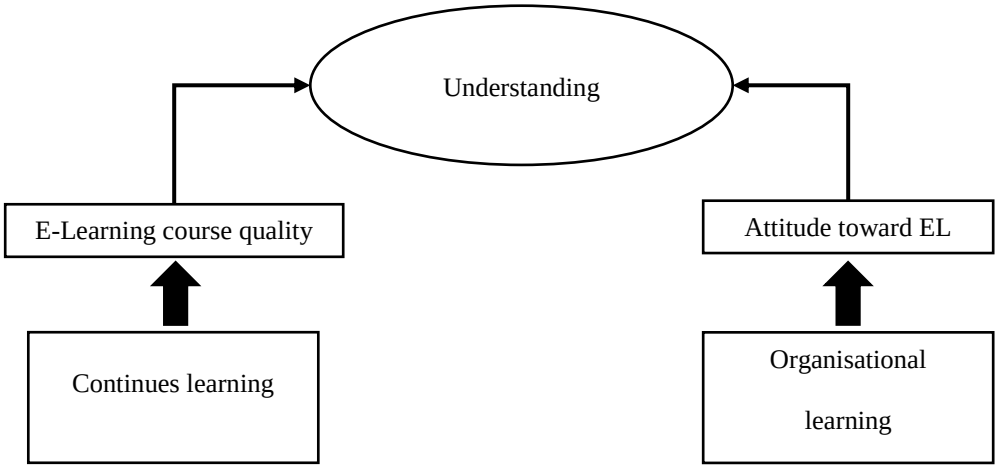


Figure 6.4: The Effect of the Integration Between EL and KM Factors to Achieve the (Understanding/Summarising) Level

6.1.3.3 Towards the "Applying/Implantation" Category

Employee empowerment was noted as having an effect on *computer training* by 0.247, this can lead to increased usage of computer-based learning for problem solving, and decision support can lead to higher employee flexibility and higher levels of competencies. A higher level of work-related competencies will ultimately lead to higher employee flexibility which will result in achieving the New Bloom's Taxonomy category of *applying/implantation* of the knowledge. In addition, the results show the *organisational learning* can have an effect on the *attitude towards EL* by 0.215. Clearly, organisations are developing and creating useful knowledge so that their staff can make use of it as and when it is needed. This will result in more effective use and will ultimately influence the performance of the organisation. It was noted previously that *organisational learning* is complementary to the KM that results in the *application* of the knowledge. In this respect, the attitude of the learners towards EL is likely to be associated with the use of telecommunication technologies to deliver the information in the field of education and training. As per Aixia and Wang (2011), globally EL is seen as a tool that provides learners with the ability to apply the knowledge and learn in an anywhere at any time capacity. *Organisational learning* is becoming one of the important ways in which organisations can strive to continuously improve their knowledge utilisation (King, 2009). Consequently, a new EL culture is being developed; this goes beyond the classroom and is becoming essential for the application of knowledge and future attainment in higher education and across organisations. Thus, EL

and KM factors can work together to facilitate the *application/implantation* category of New Bloom's Taxonomy (see Figure 6.5).

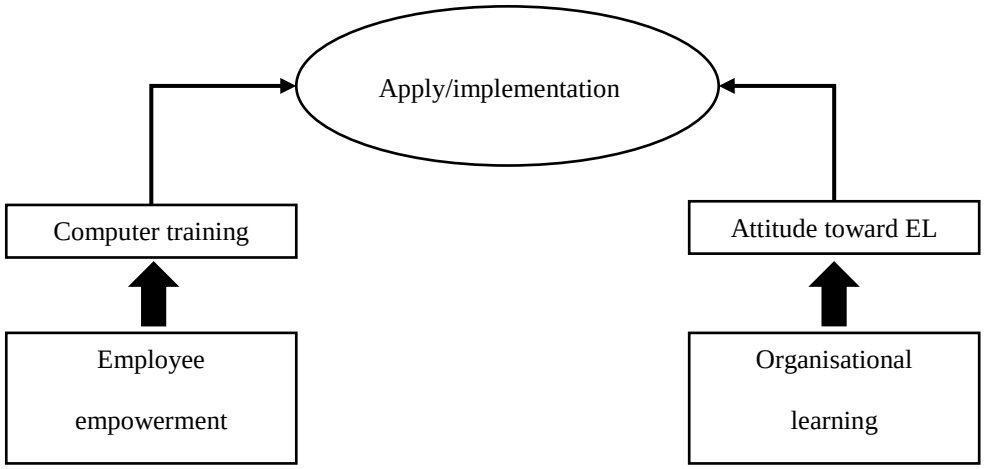


Figure 6.5: The Effect of the Integration Between EL and KM Factors to Achieve the (Applying/Implantation) Level

6.1.3.4 Towards the "Analysis/Organising" category

The results indicate that *organisational culture* positively affects *computer self-efficacy* by 0.558. It is important to note that the culture of an organisation is an important tool that affects the productivity of the employees and the organisation. The successful application of KM in an organisation can act as a source of competitive advantage that transforms the employee knowledge, it also leads them to *analyse* their knowledge. *Organisational culture* has an effect on the *computer self-efficacy* factors, including: basic computer skills, media related skills and web-based skills that are used to *analyse* the knowledge. *Computer self-efficacy* can be defined as the judgment of a person's ability to use the computer (Toe and Koh, 2010); furthermore, a person's ability to use

the computer-based technology affects their self-efficacy. The *organisational culture* can influence the knowledge of the employees, as culture determines the basic values, beliefs and norms that employees develops (Rasula, Vuksic and Stemberger, 2012). Additionly, the results show that *storage and sharing the knowledge* had an effect on *perceived usefulness* by 0.527 – this result is quite high. According to Scheg (2014), for distance EL courses, one of the main requirements is the concept of active learning. Knowledge sharing among the students is a part of daily routine and a step towards the knowledge management lifecycle; knowledge transfer takes place from groups of students to individuals and also between individuals. The principle of active learning is based on the notion that the students in this process should actively participate in the learning process, rather than simply reading books or listening to lectures. Thus, EL is beneficial as long as it has *perceived usefulness* (efficacy and compatibility) as this maintains the integration between these two factors and leads the learners to accomplish the *analysis/organise* category. Moreover *employee empowerment* was noted as having an effect on *computer training* by 0.584, this value shows there is a high effect between these factors; thus proving that *employee empowerment* helps to increase the usage of computer-based learning for problem solving and decision support which ultimately leads to higher employee flexibility and higher levels of competencies. Furthermore, a higher level of work-related competencies leads to higher employee flexibility (Siering and Pahlke, 2013). Thus, the integration of KM and EL factors can help to achieve the *analysis/organise* category of New Bloom's Taxonomy (see Figure 6.6).

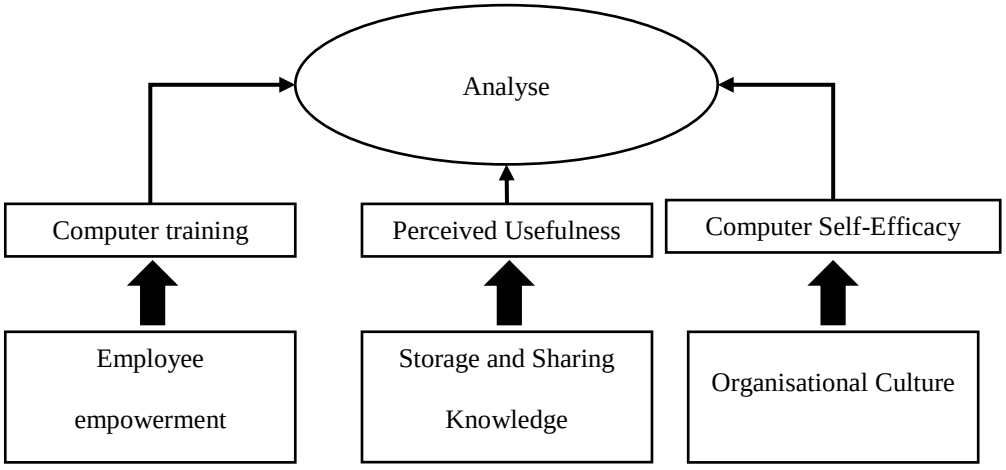


Figure 6.6: The Effect of the Integration Between EL and KM Factors to Achieve the (Analysis/Organising) Level

6.1.3.5 Towards the "Evaluation" Category

The results show that *employee empowerment* has an effect on *computer training* by 0.322. The empowerment of the employees in business organisations can provide more opportunities for increased autonomy and control in the work produced, empowerment can also help to solve problems which will ultimately result in the *evaluation* of their knowledge. Thus, *computer training* can help to enable employees to increase their skills, motivation and productivity, it can also be used to *evaluate* the knowledge of the employees. Furthermore, the employees who receive the *computer training* are likely to add a competitive advantage to the firm.

In order to *evaluate* the knowledge of the employees, organisations can formulate strategies that are aimed at increasing the decision making skills that affect their work, as well as providing them with the opportunity to participate in the organisational policy

making and thus, empowering them (Hardina, et al., 2006). However, as Jia (2012) noted, *computer training* is dependent on the resources available, and the emphasis that the organisation places on the factors of *computer training* to *evaluate* the knowledge of learners. Moreover, the results indicate that *organisational learning* has an effect on *attitude towards e-learning* by 0.459. One of the most interesting findings in this study is concerned with the level of justification, a stand or decision, that the students can reach will lead to improving *organisational learning* as a result of increased efficiency in teaching which increases access to education and training by focusing on the *attitude towards e-learning*. Thus, it is clear from these results that when KM and EL factors are integrated they can help to achieve the *evaluation* category of New Bloom's Taxonomy theory (see Figure 6.7).

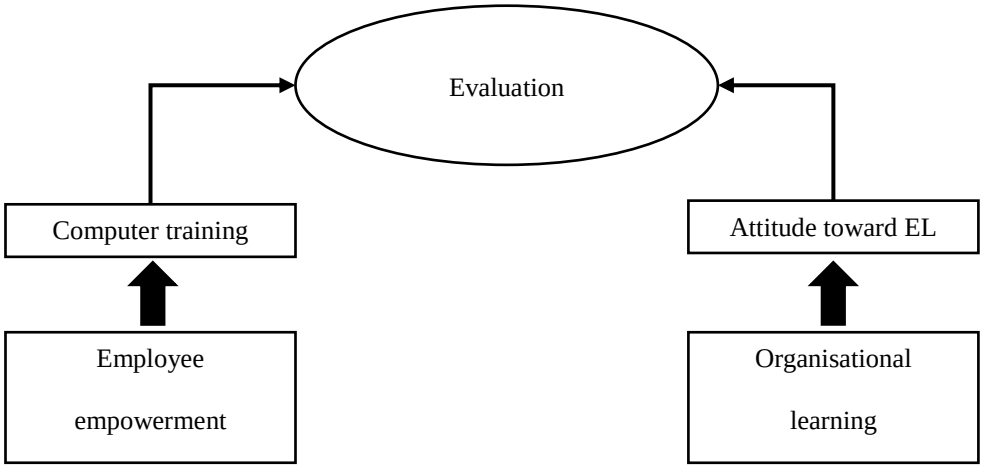


Figure 6.7: The Effect of the Integration Between EL and KM Factors to Achieve the (Evaluation) Level.

6.1.3.6 Towards the "Creating/Designing" Category

The results indicate that the *top management* had an effect on *programme flexibility*, by 0.508. Support from the *top management* is vital for the *creation* of knowledge in employees; thus, the *top management* needs to nurture and encourage the learning initiatives that are provided by the organisation not only for the talented employees but for all the employees and at all levels. For this purpose, a strategic approach to *programme flexibility* should be adopted by the organisation in an attempt to create a successful transformation that is aimed at enhancing the knowledge of the employees. Various *programme flexibility* factors need to be taken into account by organisations, these include: a clear action plan, top management support, defined timelines and a dedicated person authorised to make these changes (Australian Government, 2000). This would ultimately result in sharing the knowledge between the employees. Furthermore, the *top management* should also initiate and motivate specific sessions of learning aimed at ultimately benefiting the employees and the organisation (McIntyre et al., 2014). Thus, the flexibility of these programmes not only keeps the employees committed and engaged in the organisational goals, but this also enhances their knowledge further. Consequently, the integration of EL and KM factors appears to help with the *creating/designing* category of New Bloom's Taxonomy (see Figure 6.8).

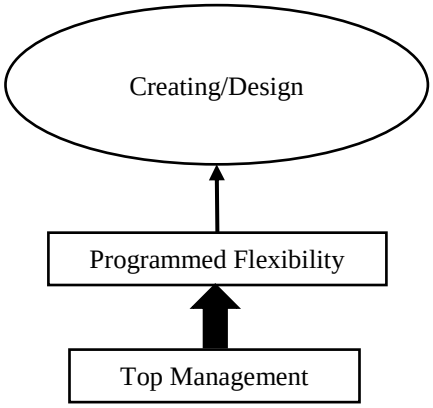
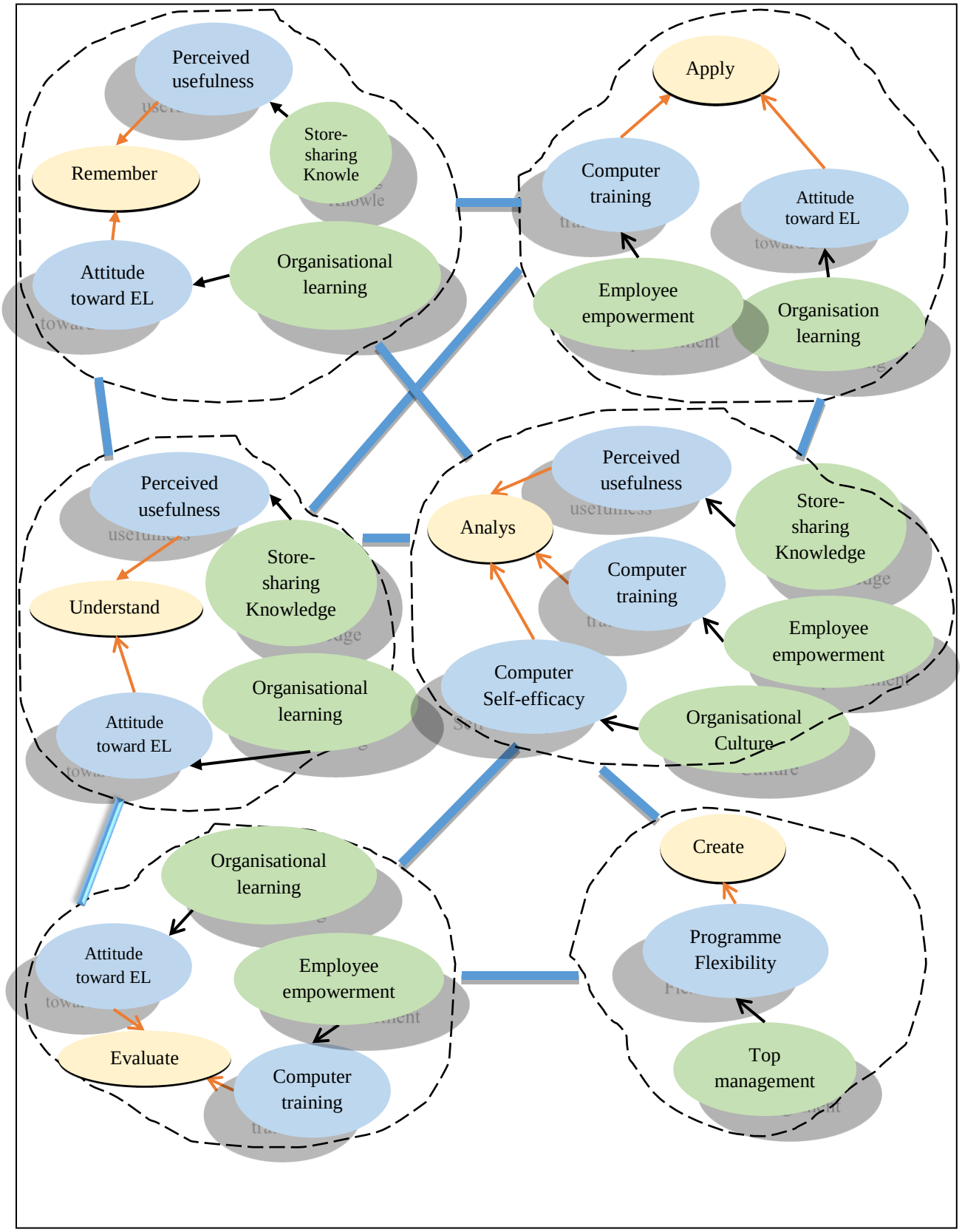


Figure 6.8: The Effect of the Integration Between EL and KM Factors to Achieve the (Creating) Level

6.2 Summary

This chapter has discussed in detail the findings from the study. The critical success factors (CSFs) have been highlighted based on the impact that they have on learner performance in higher education in Saudi Arabia, and in terms of how they correlate with New Bloom's Taxonomy. Based on the results of the tests conducted for this study, it can be concluded that the null hypothesis was proven to be correct, and it was statistically proven that KM and EL systems do contribute to the achievement of learner performance – a summary of the main contributing factors can be seen below in Figure 6.9.


Perceived usefulness
Store-sharing Knowle
Remember
Attitude toward EL
Organisational learning
Apply
Computer training
Attitude toward EL
Employee empowerment
Organisation learning
Perceived usefulness
Store-sharing Knowledge
Understand
Attitude toward EL
Organisational learning
Perceived usefulness
Analys
Store-sharing Knowledge
Computer training
Employee empowerment
Computer Self-efficacy
Organisational Culture
Organisational learning
Attitude toward EL
Employee empowerment
Evaluate
Computer training
Create
Programme Flexibility
Top management

Chapter 7: Conclusions and Future Research

7.1 Introduction

This final chapter will highlight the theoretical contributions achieved from this study, any limitations associated with the study will also be provided. Finally, at the end of this chapter, conclusions will be drawn and any recommendations for future research will also be provided.

This study focused on three institutions within the education sector: King Saud University, Imam University and Taibah University. The data was then used to focus the study on the effect of the learning process theory aspects on the integration of EL and KM factors in higher education.

The study was designed using empirical research to conduct quantitative research. A questionnaire survey was distributed to 300 participants with 133 respondents received.

7.2 Theoretical Contributions

The aims of this thesis were two fold. Firstly, from a theoretical perspective, this study investigate the integration of KM and EL factors those influence a learner's ability to improve their performance in the learning process in higher education. This is based on using the New Bloom's Taxonomy framework. Secondly, this research also attempted to

overcome many of the problems and inadequacies displayed in the previous studies, in an attempt to truly provide improvements for the field with regards to the integration of both KM and EL systems.

An extensive reviews were provided, analysed and concluded by using 6 CSFs from KM and another 6 CSFs from EL totalling of 12 CF, all based on the New Bloom's Taxonomy Framework.

Based on this review, a number of critical factors affecting learner performance in higher education of developing countries (KSA is used) were identified.

To address the relations among extracted CSFs of both EL and KM, DEMETAL method was used in an initial experiment with 30 expert respondents. It is found H3.A-F are all correct as explained in paragraph 4.4.1 and displayed in Figure 4.3. It is felt important to state that for both H1 and H2; while they were addressed by the questionnaire and results show positive outcomes as anticipated, they are possibly not addressed in depth in this study. Simply, they are related to proving positive contribution towards learner's performance where no practical experiment took place. Therefore, these hypothesis becomes part of future research. Similarly, the experiment (questionnaire) as well as the literature review have proved there are links between KM and EL CFs within the Bloom's Taxonomy Framework.

While preliminary study took place in the UK using DEMETAL method, it was found that teaching an expert (training / re-training / personal development) need different

New Bloom's Taxonomy framework compared with the existing one. This is explained in paragraph 4.4 "Discussion and Results" of Chapter 4.

The research then moved towards studying the existing framework of MoHE in KSA. The finding was stated at the end of paragraph 2.7.4 2.7on page 60 with few suggestions on improving their learning process. A reminder of these suggestion was to consider the following points in their framework being lack of supporting them:

- The flexibility of the programme;
- A clear approach towards EL;
- Empowerment of the employees.

A framework based on the New Bloom's Taxonomy is proposed as displayed in Figure 2.8 on page 63 considering all 12 KM and EL CSFs.

The work was concluded in Figure 6.9 / page 185.

7.3 Limitations of the Study

The study has faced few limitations; All organisations have some similarities and differences in terms of KM and EL implementation, the realisation of benefits, as well as some difference in critical factors; however, it should be noted that all of these differences were not taken into account in this study.

The other limitation of the study is associated with several difficulties that were faced as a result of the survey-based research method. Specifically, there was no standard measurement to judge the authenticity and sincerity of the respondents who had completed the survey questionnaire – this problem can arise when a small sample size is used to generalise across whole populations though, the researcher did authenticate the data at various levels so as to avoid any kind of discrepancy that may have crept in.

7.4 Future Research

As with all research, this research has raised further questions that could be addressed by additional research and work. Furthermore, although this study covered a broad area of research, there are many directions in which future research could be adapted. For example, it would be interesting to compare the critical factors of the integration between KM and EL to determine the effectiveness of New Bloom's Taxonomy in developed and developing counties. Ultimately, this could identify any significant comparisons concerning the effectiveness of the theory by exploring the link between the CSF in both developed and developing areas, while still being under the effect of the learning process theory.

Secondly, with regards to the New Bloom's Taxonomy framework, in the EL and KM field, it would be useful to expand upon this investigation by implementing this approach across the Saudi Arabian education systems.

Thirdly, the study of both hypothesis H1 and H2 would contributes towards improving the learning process aiming to prove these believes are correct. The time scope was an obstacle in exercising few practical experiments to assess the speed at which a learner can learn new materials and how long the learner can keep the knowledge.

Finally, it would be very interesting to further investigate the DEMETAL experiment finding and the suggested “Expert New Bloom’s Taxonomy”. It is believe this will have reasonable impact on the way employees PDPs are exercised and people’s progression.

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Appendix

Questionnaire

My name is Fatimah Alhuzali; I am currently doing a PHD at the school of Electrical Engineering and Computer Science, the University of Bradford. E-learning (EL) is a new education concept, by using the Internet as a technology, it deliveries the digital content, provides a learner-oriented environment for the teachers and students. In addition, knowledge management (KM) has increased in popularity and credibility as a management tool, as well as a research discipline, over the past decade. It is important to acknowledge that EL shares factors with KM to achieve learner performance in Saudi Arabia's higher education. Your contribution is very important and I would very much appreciate you completing the questions in the questionnaire below. This research is conducted according to UK standards of confidentiality and shall remain anonymous.

If you need to contact me or my supervisors please feel free to do so at: m.a.kamala@bradford.ac.uk (Dr Mumtaz Kamala, University of Bradford) or f.a.alhuzali@bradford.ac.uk.

Page 1: Demographics:

	25-35	35-45	45-60
What is your age	○	○	○

*** 2. Please state the extent to which you agree with the following statements On a scale of 1-5 where 1= Strongly disagree 2= Disagree 3= neither agree/disagree 4=Agree 5= Strongly agree**

Section 1; the effect of EL factors on achieving learner performance to reach the new bloom's taxonomy(learning process) theory

	1= Strongly disagree	2= Disagree	3= neither agree/disagree	4=Agree	5= Strongly agree
1. Program Flexibility leads to "Creating knowledge "	○	○	○	○	○
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	○	○	○	○	○
3. Computer training leads to "analyse the knowledge"	○	○	○	○	○
4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	○	○	○	○	○
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	○	○	○	○	○
6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement the knowledge"	○	○	○	○	○

*** 3. Please state the extent to which you agree with the following statements On a scale of 1-5 where 1= Strongly disagree 2= Disagree 3= neither agree/disagree 4=Agree 5= Strongly agree**

Section 2: the effect of KM factors on achieving learner performance to reach the new bloom's taxonomy(learning process) theory

	1= Strongly disagree	2= Disagree	3= neither agree/disagree	4=Agree	5= Strongly agree
1. Top management plays a key part on "creating knowledge "	○	○	○	○	○
2. Continuous learning (e.g. workshops, seminars, home-study or online courses, conferences), to achieve better "Understanding and Interpreting the knowledge "tends to achieve better "Understanding and Interpreting	○	○	○	○	○
3. Employee empowerment contributes to the "Evaluate and Check the knowledge	○	○	○	○	○

4. Organisational learning (e.g. systems thinking, personal mastery, mental models, shared vision and team learning) process " helps to achieve "analyses / compare contends					
5. Organisational cultural (e.g. values, visions, norms, working language)contributes to the "Apply / Implement the knowledge stages "					
6. Storing , and sharing the knowledge (e.g. Document Repositories and Management Systems, Databases) plays an important part in realising the "remembering and identification of the knowledge					

*** 4. Section3; the effect of sharing knowledge management with e-learning factors on the learner performance to reach the new bloom's taxonomy(learning process)**

TO what degree do you agree on the following statements?
0-no influence 1-low influence 2-medium influence 3-high influence 4-very high influences

A- "Remember, identify "

	0-no influence	1-low influence	2-medium influence	3-high influence	4-very high influences
1. Top management has appositive effect on "program flexibility	○	○	○	○	○
2. "Program flexibility has "effect on Top management	○	○	○	○	○
3. Employee empowerment affect positively " Computer training"	○	○	○	○	○
4. "Computer training" affect positively Employee empowerment	○	○	○	○	○
5. "Computer self –efficacy" has positive effect on the Organisational cultural	○	○	○	○	○
6. Organizational cultural positively affect " Computer	○	○	○	○	○
self-efficacy"	○	○	○	○	○

7. “Attitude towards e-learning” can effect Organisation learning	○	○	○	○	○
8. Organisational learning can effect on “Attitude towards e-learning “	○	○	○	○	○
9. “ELearning course quality” has positive effect on the Continues learning	○	○	○	○	○
10. Continues learning has positively effect on the “ELearning course quality”	○	○	○	○	○
11. “Perceived usefulness” has positive effect on Storage and sharing the knowledge	○	○	○	○	○
12. Storage and sharing the knowledge effect on “perceived usefulness”	○	○	○	○	○

*** 5. TO what degree do you agree on the following statements?**

0-no influence 1-low influence 2-medium influence 3-high influence 4-very high influences

B-"Understanding, summarising"

	0-no influence	1-low influence	2-medium influence	3-high influence	4-very high influences
1- "Attitude towards e-learning" has positive effect on Organisation learning	○	○	○	○	○
2- Organisation learning can effect on the" Attitude towards e-learning "	○	○	○	○	○
3- "E-Learning course quality contents " has positive effect on the Continue learning	○	○	○	○	○
4- Continue learning effect on " ELearning course quality contents"	○	○	○	○	○
5- " Perceived usefulness" has positive effect on Storage and sharing the knowledge	○	○	○	○	○
6- Storage and sharing the knowledge effect on perceived usefulness	○	○	○	○	○

7- "Computer training" affects positively Employee empowerment	○	○	○	○	○
8- Employee empowerment has effect on the "Computer training"	○	○	○	○	○
9- "Program flexibility" has effect on Top management	○	○	○	○	○
10- Top management has positive effect on "program flexibility"	○	○	○	○	○
11- Organizational cultural affect positively "Computer self –efficacy"	○	○	○	○	○
12- " Computer self –efficacy" has effect on Organizational cultural	○	○	○	○	○

*** 6. TO what degree do you agree on the following statements?**

0-no influence 1-low influence 2-medium influence 3-high influence 4-very high influences

C- "Applying, implantation "

	0-no influence	1-low influence	2-medium influence	3-high influence	4-very high influences
1- "Perceived usefulness "has effect positively on Storage and sharing the knowledge	○	○	○	○	○
2- Storage and sharing the knowledge effect on" perceived usefulness "	○	○	○	○	○
3- "Computer training" affect positively Employee empowerment	○	○	○	○	○
4- Employee empowerment has effect on "Computer training"	○	○	○	○	○
5- Organisational learning can effect on "Attitude towards e-learning"	○	○	○	○	○
6- "Attitude towards E-learning "affect positively Organisation learning	○	○	○	○	○

7- "Program flexibility" has effect on Top management	○	○	○	○	○
8- Top management has effect on " program flexibility"	○	○	○	○	○
9- Continues learning has effect on "E-Learning course quality"	○	○	○	○	○
10- "ELearning course quality contents " affect positively Continues learning	○	○	○	○	○
11- Organizational cultural affect positively "Computer self –efficacy"	○	○	○	○	○
12- "Computer self - efficacy " has effect positively on organisational cultural	○	○	○	○	○

*** 7. TO what degree do you agree on the following statements?**

0-no influence 1-low influence 2-medium influence 3-high influence 4-very high influences

D- " Analysis , organising "

	0-no influence	1-low influence	2-medium influence	3-high influence	4-very high influences
1- Employee empowerment has effect on" Computer training"	○	○	○	○	○
2- "Computer training "affect positively Employee empowerment	○	○	○	○	○
3- "E-Learning course quality contents " has effect on Continues learning	○	○	○	○	○
4- Continues learning has effect on "E-Learning course quality"	○	○	○	○	○
5- Top management effect on "program flexibility"	○	○	○	○	○
6- "program flexibility" affect positively Top management	○	○	○	○	○

7- "Attitude towards e-learning" effect on Organisation learning	○	○	○	○	○
8- Organisation learning effect on" Attitude towards e-learning"	○	○	○	○	○
9- Storage and sharing the knowledge effect on perceived usefulness	○	○	○	○	○
10- " Perceived usefulness" has positive effect on Storage and sharing the knowledge	○	○	○	○	○
11- " Computer self –efficacy" has effect on Organizational cultural	○	○	○	○	○
12- Organizational cultural affect positively "Computer self-efficacy"	○	○	○	○	○

*** 8. TO what degree do you agree on the following statements?**

0-no influence 1-low influence 2-medium influence 3-high influence 4-very high influences

E- "Evaluation"

	0-no influence	1-low influence	2-medium influence	3-high influence	4-very high influences
1. " Computer self –efficacy" affect positively Organizational cultural	○	○	○	○	○
2. Organizational clutural has effect on" Computer self –efficacy"	○	○	○	○	○
3. "Attitude towards e-learning" effect on Organisation learning	○	○	○	○	○
4. Organisation learning effect on "Attitude towards e-learning"	○	○	○	○	○
5. "E-Learning course quality contents " affect positively Continues learning	○	○	○	○	○
6. Continues learning effect on "E-Learning course quality"	○	○	○	○	○

7. "Perceived usefulness" effect on Storage and sharing the knowledge	○	○	○	○	○
8. Storage and sharing the knowledge effect on "perceived usefulness"	○	○	○	○	○
9. "Computer training" has appositive effect on Employee empowerment	○	○	○	○	○
10. Employee empowerment effect on "Computer training"	○	○	○	○	○
11. Program flexibility effect on the top management	○	○	○	○	○
12. Top management effect on program flexibility	○	○	○	○	○

*** 9. TO what degree do you agree on the following statements?**

0-no influence 1-low influence 2-medium influence 3-high influence 4-very high influences

F- "Creating, Designing "

	0-no influence	1-low influence	2-medium influence	3-high influence	4-very high influences
1. "E-Learning course quality contents" affects positively Continues learning	○	○	○	○	○
2. Continues learning effect on" E-Learning course quality"	○	○	○	○	○
3. "Perceived usefulness" has effect on Storage and sharing the knowledge	○	○	○	○	○
4. Storage and sharing the knowledge effect on "perceived usefulness"	○	○	○	○	○
5. "Computer training" affect positively Employee empowerment	○	○	○	○	○
6. Employee empowerment has effect on "Computer training"	○	○	○	○	○

7. Organisation learning effect on "Attitude towards e-learning"	○	○	○	○	○
8. "Attitude towards e-learning" affect positively Organisation learning	○	○	○	○	○
9. Organizational cultural effect on "Computer self –efficacy"	○	○	○	○	○
10. "Computer self -efficacy " has appositive effect on Organization al cultural	○	○	○	○	○
11. Top management effect on "program flexibility"	○	○	○	○	○
12. "Program flexibility" has effect on Top management	○	○	○	○	○

Data Analysis

Frequencies

Statistics

V4

N	**Valid**	**133**
	Missing	**0**

V4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Age 25 - 35	80	60.2	60.2	60.2
	Age 35- 45	43	32.3	32.3	92.5
	Age 45 - 60	10	7.5	7.5	100.0
	Total	133	100.0	100.0	

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.779
Bartlett's Test of Sphericity	Approx. Chi-Square	249.468
	df	15
	Sig.	.000

Communalities

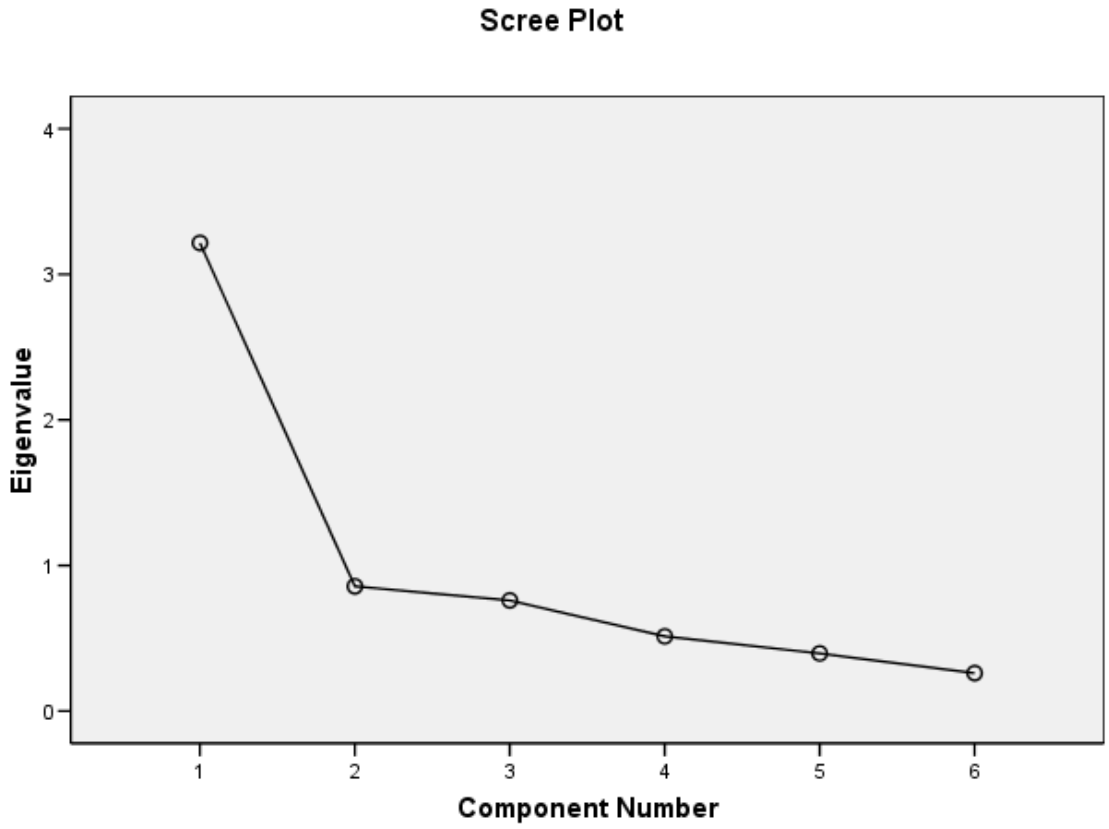
	Initial	Extraction
1. Program Flexibility leads to "Creating knowledge "	1.000	.568
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	1.000	.651
3. Computer training leads to "analyse the knowledge"	1.000	.464
4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	1.000	.549
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	1.000	.482
6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	1.000	.501

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.216	53.593	53.593	3.216	53.593	53.593
2	.857	14.276	67.870			
3	.760	12.659	80.529			
4	.513	8.547	89.076			
5	.395	6.590	95.666			
6	.260	4.334	100.000			

Extraction Method: Principal Component Analysis.



Component Matrix(a)

	Component
	1
1. Program Flexibility leads to "Creating knowledge "	.754
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	.807
3. Computer training leads to "analyse the knowledge"	.681
4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	.741
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment	.694

the knowledge"	
6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	.708

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Rotated Component Matrix(a)

a. Only one component was extracted. The solution cannot be rotated.

Component Matrix(a)

	Component
	1
1. Program Flexibility leads to "Creating knowledge "	.754
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	.807
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6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	.708

Extraction Method: Principal Component Analysis.a 1 components extracted.

Rotated Component Matrix(a)

a Only one component was extracted. The solution cannot be rotated.

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.779
Bartlett's Test of Sphericity	Approx. Chi-Square	249.468
	df	15
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Communalities

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Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.216	53.593	53.593	3.216	53.593	53.593
2	.857	14.276	67.870			

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4	.513	8.547	89.076			
5	.395	6.590	95.666			
6	.260	4.334	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix(a)

	Component
	1
1. Program Flexibility leads to "Creating knowledge "	.754
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6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	.708

Extraction Method: Principal Component Analysis.

a 1 components extracted.

NPar Tests

Chi-Square Test

Frequencies

1. **Program Flexibility leads to "Creating knowledge "**

	Observed N	Expected N	Residual
0	1	19.5	-18.5
Strongly Disagree	4	19.5	-15.5
Disagree	20	19.5	.5
Neutral	24	19.5	4.5
Agree	61	19.5	41.5
Strongly Agree	7	19.5	-12.5
Total	117		

2. **In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"**

	Observed N	Expected N	Residual
0	1	19.5	-18.5
1	1	19.5	-18.5
2	12	19.5	-7.5
3	29	19.5	9.5
4	40	19.5	20.5
5	34	19.5	14.5
Total	117		

3. **Computer training leads to "analyse the knowledge"**

	Observed N	Expected N	Residual
0	1	23.4	-22.4
2	11	23.4	-12.4
3	28	23.4	4.6
4	59	23.4	35.6

5	18	23.4	-5.4
Total	117		

4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"

	Observed N	Expected N	Residual
0	1	19.5	-18.5
1	1	19.5	-18.5
2	6	19.5	-13.5
3	22	19.5	2.5
4	65	19.5	45.5
5	22	19.5	2.5
Total	117		

5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"

	Observed N	Expected N	Residual
0	1	19.5	-18.5
1	2	19.5	-17.5
2	11	19.5	-8.5
3	26	19.5	6.5
4	49	19.5	29.5
5	28	19.5	8.5
Total	117		

6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"

	Observed N	Expected N	Residual
0	2	19.5	-17.5
1	2	19.5	-17.5
2	7	19.5	-12.5
3	22	19.5	2.5
4	52	19.5	32.5
5	32	19.5	12.5
Total	117		

Test Statistics

	1. Program Flexibility leads to "Creating knowledge "	2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	3. Computer training leads to "analyse the knowledge"	4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"
Chi-Square(a,b)	127.256	74.949	84.325	151.256	87.462	101.923
df	5	5	4	5	5	5
Asymp. Sig.	.000	.000	.000	.000	.000	.000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 19.5.

b 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 23.4.

Quick Cluster

Initial Cluster Centers

	Cluster	
	1	2
1. Program Flexibility leads to "Creating knowledge "	0	5
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	0	5
3. Computer training leads to "analyse the knowledge"	0	5
4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	0	5
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	0	5
6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	0	5

Iteration History(a)

Iteration	Change in Cluster Centers	
	1	2
1	4.702	2.940
2	1.389	.273
3	.582	.224
4	.100	.029
5	.157	.050

6	.000	.000

a Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is .000. The current iteration is 6. The minimum distance between initial centers is 12.247.

Final Cluster Centers

	Cluster	
	1	2
1. Program Flexibility leads to "Creating knowledge "	2	4
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	3	4
3. Computer training leads to "analyse the knowledge"	3	4
4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	3	4
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	3	4
6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	3	4

Discriminant

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		115	98.3
Excluded	Missing or out-of-range group codes	2	1.7
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Total	2	1.7

Total	117	100.0

Group Statistics

6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"		Valid N (listwise)	
		Unweighted	Weighted
1	2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	2	2.000
	3. Computer training leads to "analyse the knowledge"	2	2.000
	4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	2	2.000
	5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	2	2.000
	1. Program Flexibility leads to "Creating knowledge "	2	2.000
2	2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	7	7.000
	3. Computer training leads to "analyse the knowledge"	7	7.000
	4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	7	7.000
	5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	7	7.000
	1. Program Flexibility leads to "Creating	7	7.000

	knowledge “		
3	2. In course quality contents (e.g. video, writing, images) help to achieve “remembering and identifying the knowledge”	22	22.000
	3. Computer training leads to “analyse the knowledge”	22	22.000
	4. Attitude towards e-learning achieve better “ Understanding /Interpreting the knowledge”	22	22.000
	5. Computer self-efficacy (e.g. judgment of one’s capability to use a computer)” supports to “Evaluate / Experiment the knowledge”	22	22.000
	1. Program Flexibility leads to “Creating knowledge “	22	22.000
4	2. In course quality contents (e.g. video, writing, images) help to achieve “remembering and identifying the knowledge”	52	52.000
	3. Computer training leads to “analyse the knowledge”	52	52.000
	4. Attitude towards e-learning achieve better “ Understanding /Interpreting the knowledge”	52	52.000
	5. Computer self-efficacy (e.g. judgment of one’s capability to use a computer)” supports to “Evaluate / Experiment the knowledge”	52	52.000
	1. Program Flexibility leads to “Creating knowledge “	52	52.000
5	2. In course quality contents (e.g. video, writing, images) help to achieve “remembering and identifying the knowledge”	32	32.000
	3. Computer training leads to “analyse the knowledge”	32	32.000
	4. Attitude towards e-learning achieve better “ Understanding /Interpreting the knowledge”	32	32.000

	5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	32	32.000
	1. Program Flexibility leads to "Creating knowledge "	32	32.000
Total	2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	115	115.000
	3. Computer training leads to "analyse the knowledge"	115	115.000
	4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	115	115.000
	5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	115	115.000
	1. Program Flexibility leads to "Creating knowledge "	115	115.000

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	.702	11.693	4	110	.000
3. Computer training leads to "analyse the knowledge"	.894	3.264	4	110	.014
4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	.867	4.220	4	110	.003
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	.787	7.430	4	110	.000

1. Program Flexibility leads to "Creating knowledge "	.861	4.446	4	110	.002

Analysis 1

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.666(a)	80.3	80.3	.632
2	.149(a)	17.9	98.2	.360
3	.012(a)	1.5	99.7	.111
4	.002(a)	.3	100.0	.050

a First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.515	72.342	20	.000
2 through 4	.858	16.727	12	.160
3 through 4	.985	1.614	6	.952
4	.998	.272	2	.873

Standardized Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	.835	-.118	-.913	-.186
3. Computer training leads to "analyse the knowledge"	-.129	1.035	.032	.250

4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	.177	-.817	.558	.032
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	.549	.188	.051	.653
1. Program Flexibility leads to "Creating knowledge "	-.127	.184	.918	-.731

Structure Matrix

	Function			
	1	2	3	4
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	.795(*)	.147	-.225	-.510
3. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	.633(*)	.091	.333	.582
4. Computer training leads to "analyse the knowledge"	.253	.711(*)	.292	.118
5. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	.457	-.262	.587(*)	.206
1. Program Flexibility leads to "Creating knowledge "	.469	.275	.480	-.669(*)

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
2. In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	.974	-.138	-1.066	-.217
3. Computer training leads to "analyse the knowledge"	-.159	1.279	.040	.309
4. Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	.230	-1.062	.726	.041
5. Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	.618	.212	.058	.736
1. Program Flexibility leads to "Creating knowledge "	-.140	.203	1.009	-.803
(Constant)	-5.873	-1.624	-2.545	-.518

Unstandardized coefficients

Functions at Group Centroids

6. Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"				
	Function			
	1	2	3	4
1	-3.586	1.559	.467	-.044
2	-.849	-.395	-.116	-.170
3	-1.027	-.428	-.028	.054
4	.252	.307	-.071	.007
5	.706	-.215	.131	-.009

Unstandardized canonical discriminant functions evaluated at group means

Discriminant

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		116	100.0
Excluded	Missing or out-of-range group codes	0	.0
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Total	0	.0
Total		116	100.0

Group Statistics

Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"		Valid N (listwise)	
		Unweighted	Weighted
1	Program Flexibility leads to "Creating knowledge "	1	1.000
	In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	1	1.000
	Computer training leads to "analyse the knowledge"	1	1.000
	Computer self-efficacy (e.g. judgment of one's	1	1.000

	capability to use a computer)" supports to "Evaluate / Experiment the knowledge"		
	Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	1	1.000
2	Program Flexibility leads to "Creating knowledge "	6	6.000
	In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	6	6.000
	Computer training leads to "analyse the knowledge"	6	6.000
	Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	6	6.000
	Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to	6	6.000

	"Apply/Implement \the knowledge"		
3	Program Flexibility leads to "Creating knowledge "	22	22.000
	In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	22	22.000
	Computer training leads to "analyse the knowledge"	22	22.000
	Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	22	22.000
	Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	22	22.000
4	Program Flexibility leads to "Creating knowledge "	65	65.000
	In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the	65	65.000

	knowledge"		
	Computer training leads to "analyse the knowledge"	65	65.000
	Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	65	65.000
	Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	65	65.000
5	Program Flexibility leads to "Creating knowledge "	22	22.000
	In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	22	22.000
	Computer training leads to "analyse the knowledge"	22	22.000
	Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	22	22.000

	Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	22	22.000
Total	Program Flexibility leads to "Creating knowledge "	116	116.000
	In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	116	116.000
	Computer training leads to "analyse the knowledge"	116	116.000
	Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	116	116.000
	Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	116	116.000

Analysis 1

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.564(a)	70.6	70.6	.600
2	.136(a)	17.0	87.6	.346
3	.068(a)	8.5	96.2	.253
4	.031(a)	3.8	100.0	.172

a. First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.511	73.754	20	.000
2 through 4	.800	24.572	12	.017
3 through 4	.908	10.565	6	.103
4	.970	3.317	2	.190

Standardized Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
Program Flexibility leads to "Creating knowledge "	.097	-.436	.665	.992
In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	.028	.910	-.228	-.834
Computer training leads to "analyse the	.671	-.582	.171	-.503

knowledge"				
Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	.560	.086	-.824	.363
Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	.151	.376	.570	.185

Structure Matrix

	Function			
	1	2	3	4
Computer training leads to "analyse the knowledge"	.752(*)	-.395	.275	-.448
Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	.675(*)	.259	-.543	.426
In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	.445	.631(*)	.318	-.183
Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	.427	.603(*)	.394	.163
Program Flexibility leads to "Creating knowledge "	.428	.122	.532(*)	.441

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"				
	Function			
	1	2	3	4
1	-1.574	-3.591	-.348	-.522
2	-1.863	.383	.579	-.406
3	-.957	.139	-.364	.107
4	.236	-.077	.149	.093
5	.839	.148	-.219	-.246

Unstandardized canonical discriminant functions evaluated at group means

Classification Statistics

Prior Probabilities for Groups

Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"			
	Prior	Cases Used in Analysis	
	Unweighted	Weighted	Unweighted
1	.200	1	1.000
2	.200	6	6.000
3	.200	22	22.000
4	.200	65	65.000
5	.200	22	22.000
Total	1.000	116	116.000

Classification Function Coefficients

	Attitude towards e-learning achieve better "Understanding /Interpreting the knowledge"

	1	2	3	4	5
Program Flexibility leads to "Creating knowledge "	1.880	.762	.843	1.427	.752
In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	-2.203	1.298	.865	.579	1.203
Computer training leads to "analyse the knowledge"	7.388	4.119	4.568	5.956	6.473
Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	2.153	1.534	3.188	3.440	4.053
Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	.369	2.497	2.074	2.487	2.384
(Constant)	-19.501	-16.956	-20.334	-28.468	-32.756

Fisher's linear discriminant functions

Frequencies

Statistics

		Program Flexibility leads to "Creating knowledge "	In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"	Computer training leads to "analyse the knowledge"	Attitude towards e-learning achieve better " Understanding /Interpreting the knowledge"	Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"	Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement \the knowledge"	E-Learning helps in achieving learning process
N	Valid	116	116	116	116	116	116	116
	Missing	0	0	0	0	0	0	0

Frequency Table

Program Flexibility leads to "Creating knowledge"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	3.4	3.4	3.4
	Disagree	20	17.2	17.2	20.7

	Neutral	24	20.7	20.7	41.4
	Agree	61	52.6	52.6	94.0
	Strongly Agree	7	6.0	6.0	100.0
	Total	116	100.0	100.0	

In course quality contents (e.g. video, writing, images) help to achieve "remembering and identifying the knowledge"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	.9	.9	.9
	2	12	10.3	10.3	11.2
	3	29	25.0	25.0	36.2
	4	40	34.5	34.5	70.7
	5	34	29.3	29.3	100.0
	Total	116	100.0	100.0	

Computer training leads to "analyse the knowledge"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	11	9.5	9.5	9.5
	3	28	24.1	24.1	33.6
	4	59	50.9	50.9	84.5
	5	18	15.5	15.5	100.0
	Total	116	100.0	100.0	

Attitude towards e-learning achieve better "Understanding /Interpreting the knowledge"

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	1	1	.9	.9	.9
	2	6	5.2	5.2	6.0
	3	22	19.0	19.0	25.0
	4	65	56.0	56.0	81.0
	5	22	19.0	19.0	100.0
	Total	116	100.0	100.0	

Computer self-efficacy (e.g. judgment of one's capability to use a computer)" supports to "Evaluate / Experiment the knowledge"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	1.7	1.7	1.7
	2	11	9.5	9.5	11.2
	3	26	22.4	22.4	33.6
	4	49	42.2	42.2	75.9
	5	28	24.1	24.1	100.0
	Total	116	100.0	100.0	

Perceived usefulness (The degree to which a person believes that using e-learning system would enhance his or her learning performance) helps to "Apply/Implement the knowledge"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	.9	.9	.9
	1	2	1.7	1.7	2.6
	2	7	6.0	6.0	8.6
	3	22	19.0	19.0	27.6
	4	52	44.8	44.8	72.4
	5	32	27.6	27.6	100.0

	Total	116	100.0	100.0	

E-Learning helps in achieving learning process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	22	19.0	19.0	19.0
	4	45	38.8	38.8	57.8
	5	49	42.2	42.2	100.0
	Total	116	100.0	100.0	

Discriminant

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		116	100.0
Excluded	Missing or out-of-range group codes	0	.0
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Total	0	.0
Total		116	100.0

Group Statistics

Organisational learning tends to achieve better "Understanding and Interpreting the knowledge "			
		Valid N (listwise)	
		Unweighted	Weighted
Strongly Disagree	Top management plays a key part on "creating knowledge "	3	3.000
	Continuous learning plays an important part in realising the "remembering and identification of knowledge "	3	3.000
	Employee empowerment helps to achieve "analyses / compare knowledge "	3	3.000
	Organisational cultural contributes to the "Evaluate and Check the knowledge process "	3	3.000
	Storing , and sharing the knowledge contributes to the "Apply / Implement the knowledge stages "	3	3.000
Disagree	Top management plays a key part on "creating knowledge "	13	13.000
	Continuous learning plays an important part in realising the "remembering and identification of knowledge "	13	13.000
	Employee empowerment helps to achieve "analyses / compare knowledge "	13	13.000
	Organisational cultural contributes to the "Evaluate and Check the knowledge process "	13	13.000
	Storing , and sharing the knowledge contributes to the "Apply / Implement the knowledge stages "	13	13.000
Neither Agree/Disagree	Top management plays a key part on "creating knowledge "	19	19.000

	Continuous learning plays an important part in realising the “remembering and identification of knowledge “	19	19.000
	Employee empowerment helps to achieve “analyses / compare knowledge “	19	19.000
	Organisational cultural contributes to the “Evaluate and Check the knowledge process “	19	19.000
	Storing , and sharing the knowledge contributes to the “Apply / Implement the knowledge stages ”	19	19.000
Agree	Top management plays a key part on “creating knowledge “	54	54.000
	Continuous learning plays an important part in realising the “remembering and identification of knowledge “	54	54.000
	Employee empowerment helps to achieve “analyses / compare knowledge “	54	54.000
	Organisational cultural contributes to the “Evaluate and Check the knowledge process “	54	54.000
	Storing , and sharing the knowledge contributes to the “Apply / Implement the knowledge stages ”	54	54.000
Strongly Agree	Top management plays a key part on “creating knowledge “	27	27.000
	Continuous learning plays an important part in realising the “remembering and identification of knowledge “	27	27.000
	Employee empowerment helps to achieve “analyses / compare knowledge “	27	27.000
	Organisational cultural contributes to the “Evaluate and Check the knowledge process “	27	27.000

	Storing , and sharing the knowledge contributes to the “Apply / Implement the knowledge stages ”	27	27.000
Total	Top management plays a key part on “creating knowledge “	116	116.000
	Continuous learning plays an important part in realising the “remembering and identification of knowledge “	116	116.000
	Employee empowerment helps to achieve “analyses / compare knowledge “	116	116.000
	Organisational cultural contributes to the “Evaluate and Check the knowledge process “	116	116.000
	Storing , and sharing the knowledge contributes to the “Apply / Implement the knowledge stages ”	116	116.000

Analysis 1

Variables Failing Tolerance Test(a)

	Within-Groups Variance	Tolerance	Minimum Tolerance
Organisational cultural contributes to the “Evaluate and Check the knowledge process “	.000	.000	.000

All variables passing the tolerance criteria are entered simultaneously.

a. Minimum tolerance level is .001.

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.544(a)	86.9	86.9	.594
2	.070(a)	11.2	98.2	.256
3	.011(a)	1.8	100.0	.106
4	.000(a)	.0	100.0	.011

a First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.598	56.789	16	.000
2 through 4	.924	8.772	9	.459
3 through 4	.989	1.255	4	.869
4	1.000	.014	1	.905

Standardised Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
Top management plays a key part on "creating knowledge "	.209	.600	.041	.875
Continuous learning plays an important part in realising the "remembering and identification of knowledge "	.431	-.819	.623	-.023
Employee empowerment helps to achieve "analyses / compare knowledge "	.301	.646	.377	-.667
Storing , and sharing the knowledge contributes to the "Apply / Implement the knowledge	.550	-.086	-.892	-.064

stages ”				

Structure Matrix

	Function			
	1	2	3	4
Storing , and sharing the knowledge contributes to the “Apply / Implement the knowledge stages ”	.760(*)	-.081	-.637	-.096
Continuous learning plays an important part in realising the “remembering and identification of knowledge “	.722(*)	-.479	.481	.134
Employee empowerment helps to achieve “analyses / compare knowledge “	.554	.555(*)	.326	-.528
Top management plays a key part on “creating knowledge “	.497	.404	.215	.737(*)

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

Organisational learning tends to achieve better “Understanding and Interpreting the knowledge“				
	Function			
	1	2	3	4
Strongly Disagree	-1.319	1.491	.119	-.001
Disagree	-1.353	-.114	-.161	.015
Neither Agree/Disagree	-.646	-.135	.014	-.022
Agree	.177	-.068	.090	.006
Strongly Agree	.898	.119	-.126	-.003

Unstandardized canonical discriminant functions evaluated at group means

Frequencies

Statistics

		Top management plays a key part on "creating knowledge"	Continuous learning plays an important part in realising the "remembering and identification of knowledge"	Employee empowerment helps to achieve "analyses / compare knowledge"	Organisational learning tends to achieve better "Understanding and Interpreting the knowledge"	Organisational cultural contributes to the "Evaluate and Check the knowledge process "	Storing , and sharing the knowledge contributes to the "Apply / Implement the knowledge stages"
N	Valid	116	116	116	116	116	116
	Missing	0	0	0	0	0	0

Frequency Table

Top management plays a key part on "creating knowledge"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.9	.9	.9
	Disagree	8	6.9	6.9	7.8
	Neither Agree/Disagree	37	31.9	31.9	39.7
	Agree	50	43.1	43.1	82.8
	Strongly Agree	20	17.2	17.2	100.0
	Total	116	100.0	100.0	

Continual learning plays an important part in realising the "remembering and identification of knowledge"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.9	.9	.9
	Disagree	6	5.2	5.2	6.0
	Neither Agree/Disagree	25	21.6	21.6	27.6
	Agree	50	43.1	43.1	70.7
	Strongly Agree	34	29.3	29.3	100.0
	Total	116	100.0	100.0	

Employee empowerment helps to achieve "analyses / compare knowledge "

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	6.9	6.9	6.9
	Neither Agree/Disagree	21	18.1	18.1	25.0
	Agree	62	53.4	53.4	78.4
	Strongly Agree	25	21.6	21.6	100.0
	Total	116	100.0	100.0	

Organisational learning tends to achieve better "Understanding and Interpreting the knowledge "

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.6	2.6	2.6
	Disagree	13	11.2	11.2	13.8
	Neither Agree/Disagree	19	16.4	16.4	30.2
	Agree	54	46.6	46.6	76.7
	Strongly Agree	27	23.3	23.3	100.0
	Total	116	100.0	100.0	

Organisational culture contributes to the "Evaluate and Check the knowledge process"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.6	2.6	2.6
	Disagree	13	11.2	11.2	13.8
	Neither Agree/Disagree	19	16.4	16.4	30.2
	Agree	54	46.6	46.6	76.7
	Strongly Agree	27	23.3	23.3	100.0
	Total	116	100.0	100.0	

Storing , and sharing the knowledge contributes to the "Apply / Implement the knowledge stages "

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	.9	.9	.9

	Strongly Disagree	2	1.7	1.7	2.6
	Disagree	10	8.6	8.6	11.2
	Neither Agree/Disagree	26	22.4	22.4	33.6
	Agree	49	42.2	42.2	75.9
	Strongly Agree	28	24.1	24.1	100.0
	Total	116	100.0	100.0	

Discriminant

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		133	100.0
Excluded	Missing or out-of-range group codes	0	.0
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Total	0	.0
Total		133	100.0

Group Statistics

"ELearning course quality" has positive effect on the Continues learning			
		Valid N (listwise)	
		Unweighted	Weighted
0	Top management has appositive effect on "program flexibility	21	21.000
	"Program flexibility has "effect on Top management	21	21.000
	Employee empowerment affect positively " Computer training"	21	21.000

	"Computer training" affect positively Employee empowerment	21	21.000
	"Computer self –efficacy" has positive effect on the Organisational learning	21	21.000
	Organisational learning positively affect " Computer self - Efficacy	21	21.000
	"Attitude towards e-learning" can effect Organisation learning	21	21.000
	Organisational learning can effect on "Attitude towards e-learning "	21	21.000
	Continues learning has positively effect on the "ELearning course quality"	21	21.000
	"Perceived usefulness" has positive effect on Storage and sharing the knowledge	21	21.000
	Storage and sharing the knowledge effect on "perceived usefulness"	21	21.000
1	Top management has appositive effect on "program flexibility	18	18.000
	"Program flexibility has "effect on Top management	18	18.000
	Employee empowerment affect positively " Computer training"	18	18.000
	"Computer training" affect positively Employee empowerment	18	18.000
	"Computer self –efficacy" has positive effect on the Organisational learning	18	18.000
	Organisational learning positively affect " Computer self - Efficacy	18	18.000
	"Attitude towards e-learning" can effect Organisation learning	18	18.000
	Organisational learning can effect on "Attitude towards e-learning "	18	18.000
	Continues learning has positively effect on the "ELearning course quality"	18	18.000

	“Perceived usefulness” has positive effect on Storage and sharing the knowledge	18	18.000
	Storage and sharing the knowledge effect on “perceived usefulness”	18	18.000
2	Top management has appositive effect on “program flexibility	25	25.000
	"Program flexibility has “effect on Top management	25	25.000
	Employee empowerment affect positively “ Computer training”	25	25.000
	“Computer training” affect positively Employee empowerment	25	25.000
	“Computer self –efficacy” has positive effect on the Organisational learning	25	25.000
	Organisational learning positively affect “ Computer self - Efficacy	25	25.000
	“Attitude towards e-learning” can effect Organisation learning	25	25.000
	Organisational learning can effect on “Attitude towards e-learning “	25	25.000
	Continues learning has positively effect on the “ELearning course quality”	25	25.000
	“Perceived usefulness” has positive effect on Storage and sharing the knowledge	25	25.000
	Storage and sharing the knowledge effect on “perceived usefulness”	25	25.000
3	Top management has appositive effect on “program flexibility	45	45.000
	"Program flexibility has “effect on Top management	45	45.000
	Employee empowerment affect positively “ Computer training”	45	45.000
	“Computer training” affect positively Employee empowerment	45	45.000

	“Computer self –efficacy” has positive effect on the Organisational learning	45	45.000
	Organisational learning positively affect “ Computer self - Efficacy	45	45.000
	“Attitude towards e-learning” can effect Organisation learning	45	45.000
	Organisational learning can effect on “Attitude towards e-learning “	45	45.000
	Continues learning has positively effect on the “ELearning course quality”	45	45.000
	“Perceived usefulness” has positive effect on Storage and sharing the knowledge	45	45.000
	Storage and sharing the knowledge effect on “perceived usefulness”	45	45.000
4	Top management has appositive effect on “program flexibility	24	24.000
	"Program flexibility has “effect on Top management	24	24.000
	Employee empowerment affect positively “ Computer training”	24	24.000
	“Computer training” affect positively Employee empowerment	24	24.000
	“Computer self –efficacy” has positive effect on the Organisational learning	24	24.000
	Organisational learning positively affect “ Computer self - Efficacy	24	24.000
	“Attitude towards e-learning” can effect Organisation learning	24	24.000
	Organisational learning can effect on “Attitude towards e-learning “	24	24.000
	Continues learning has positively effect on the “ELearning course quality”	24	24.000
	“Perceived usefulness” has positive effect on Storage and sharing the knowledge	24	24.000

	Storage and sharing the knowledge effect on "perceived usefulness"	24	24.000
Total	Top management has appositive effect on "program flexibility	133	133.000
	"Program flexibility has "effect on Top management	133	133.000
	Employee empowerment affect positively " Computer training"	133	133.000
	"Computer training" affect positively Employee empowerment	133	133.000
	"Computer self –efficacy" has positive effect on the Organisational culture	133	133.000
	Organisational culturepositively affect " Computer self - Efficacy	133	133.000
	"Attitude towards e-learning" can effect Organisation learning	133	133.000
	Organisational learning can effect on "Attitude towards e-learning "	133	133.000
	Continual learning has positively effect on the "ELearning course quality"	133	133.000
	"Perceived usefulness" has positive effect on Storage and sharing the knowledge	133	133.000
	Storage and sharing the knowledge effect on "perceived usefulness"	133	133.000

Analysis 1

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	**3.830(a)**	**92.0**	**92.0**	**.890**

2	**.253(a)**	**6.1**	**98.1**	**.449**
3	**.053(a)**	**1.3**	**99.3**	**.223**
4	**.029(a)**	**.7**	**100.0**	**.167**

a. First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.153	233.060	44	.000
2 through 4	.737	37.770	30	.156
3 through 4	.924	9.847	18	.937
4	.972	3.500	8	.899

Standardised Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
Top management has appositive effect on “program flexibility	-.023	.223	.161	.503
"Program flexibility has “effect on Top management	.172	.584	-.032	.303
Employee empowerment affect positively “ Computer training”	.189	-.007	-.170	-.442
“Computer training” affect positively Employee empowerment	.322	-.086	.143	.023
“Computer self –efficacy” has positive effect on the Organisational learning	.061	.375	-.165	-.573
Organisational learning positively affect “ Computer self - Efficacy	-.129	.327	.578	.703
“Attitude towards e-learning” can effect Organisation learning	.110	.228	-.454	-.282

Organisational learning can effect on "Attitude towards e-learning "	.432	-.381	-.307	-.171
Continues learning has positively effect on the "ELearning course quality"	.255	-.605	-.563	.461
"Perceived usefulness" has positive effect on Storage and sharing the knowledge	.485	-.328	.320	.041
Storage and sharing the knowledge effect on "perceived usefulness"	-.144	-.110	.795	-.443

Structure Matrix

	Function			
	1	2	3	4
Organisational learning can effect on "Attitude towards e-learning "	.654(*)	-.014	-.118	-.097
"Perceived usefulness" has positive effect on Storage and sharing the knowledge	.586(*)	-.277	.489	-.068
"Program flexibility has "effect on Top management	.543(*)	.511	.042	.102
Continues learning has positively effect on the "ELearning course quality"	.542(*)	-.322	-.163	.359
"Attitude towards e-learning" can effect Organisation learning	.536(*)	.244	-.204	-.049
"Computer self –efficacy" has positive effect on the Organisational learning	.502(*)	.460	.038	-.318
Employee empowerment affect positively " Computer training"	.480(*)	.300	-.112	-.066
Top management has appositive effect on "program flexibility	.471(*)	.327	.015	.393
"Computer training" affect positively Employee empowerment	.469(*)	.167	.018	.087
Organisational learning positively affect " Computer self - Efficacy	.401(*)	.336	.260	.376

Storage and sharing the knowledge effect on “perceived usefulness”	.463	-.143	.573(*)	-.228

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

"ELearning course quality” has positive effect on the Continues learning				
	Function			
	1	2	3	4
0	-4.124	-.318	.067	.077
1	-.457	1.103	-.231	.086
2	.242	-.282	-.254	-.273
3	.961	.122	.280	-.049
4	1.897	-.485	-.146	.245

Unstandardized canonical discriminant functions evaluated at group means

Frequencies

Statistics

		Top management has appositive effect on "program flexibility	"Program flexibility has "effect on Top management	Employee empowerment affect positively " Computer training"	"Computer training" affect positively Employee empowerment	"Computer self –efficacy" has positive effect on the Organisational learning	Organisational learning positively affect " Computer self - Efficacy	"Attitude towards e-learning" can effect Organisation learning	Organisational learning can effect on "Attitude towards e-learning "	"ELearning course quality" has positive effect on the Continues learning	Continues learning has positively effect on the "ELearning course quality"	"Perceived usefulness" has positive effect on Storage and sharing the knowledge	Storage and sharing the knowledge effect on "perceived usefulness"
N	Valid	133	133	133	133	133	133	133	133	133	133	133	133
	Missing	0	0	0	0	0	0	0	0	0	0	0	0

Frequency Table

Top management has appositive effect on "program flexibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.8	15.8	15.8
	1	19	14.3	14.3	30.1
	2	29	21.8	21.8	51.9
	3	45	33.8	33.8	85.7
	4	19	14.3	14.3	100.0
	Total	133	100.0	100.0	

"Program flexibility has "effect on Top management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	16.5	16.5	16.5
	1	15	11.3	11.3	27.8
	2	35	26.3	26.3	54.1
	3	41	30.8	30.8	85.0
	4	20	15.0	15.0	100.0
	Total	133	100.0	100.0	

Employee empowerment affect positively "Computer training"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	24	18.0	18.0	18.0
	1	12	9.0	9.0	27.1
	2	34	25.6	25.6	52.6

	3	39	29.3	29.3	82.0
	4	24	18.0	18.0	100.0
	Total	133	100.0	100.0	

"Computer training" affect positively Employee empowerment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	17.3	17.3	17.3
	1	14	10.5	10.5	27.8
	2	14	10.5	10.5	38.3
	3	56	42.1	42.1	80.5
	4	26	19.5	19.5	100.0
	Total	133	100.0	100.0	

"Computer self –efficacy" has positive effect on the Organisational culture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.8	15.8	15.8
	1	5	3.8	3.8	19.5
	2	36	27.1	27.1	46.6
	3	50	37.6	37.6	84.2
	4	21	15.8	15.8	100.0
	Total	133	100.0	100.0	

Organisational culture positively affect "Computer self - Efficacy

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	0	24	18.0	18.0	18.0
	1	16	12.0	12.0	30.1
	2	22	16.5	16.5	46.6
	3	49	36.8	36.8	83.5
	4	22	16.5	16.5	100.0
	Total	133	100.0	100.0	

"Attitude towards e-learning" can effect Organisation learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	15.0	15.0	15.0
	1	9	6.8	6.8	21.8
	2	29	21.8	21.8	43.6
	3	57	42.9	42.9	86.5
	4	18	13.5	13.5	100.0
	Total	133	100.0	100.0	

Organisational learning can effect on "Attitude towards e-learning "

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	14.3	14.3	14.3
	1	12	9.0	9.0	23.3
	2	29	21.8	21.8	45.1
	3	50	37.6	37.6	82.7
	4	23	17.3	17.3	100.0
	Total	133	100.0	100.0	

"ELearning course quality" has positive effect on the Continual learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.8	15.8	15.8
	1	18	13.5	13.5	29.3
	2	25	18.8	18.8	48.1
	3	45	33.8	33.8	82.0
	4	24	18.0	18.0	100.0
	Total	133	100.0	100.0	

Continual learning has positively effect on the "ELearning course quality"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	17.3	17.3	17.3
	1	20	15.0	15.0	32.3
	2	24	18.0	18.0	50.4
	3	44	33.1	33.1	83.5
	4	22	16.5	16.5	100.0
	Total	133	100.0	100.0	

"Perceived usefulness" has positive effect on Storage and sharing the knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.8	15.8	15.8
	1	19	14.3	14.3	30.1
	2	31	23.3	23.3	53.4
	3	44	33.1	33.1	86.5

	4	18	13.5	13.5	100.0
	Total	133	100.0	100.0	

Storage and sharing the knowledge effect on "perceived usefulness"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	17.3	17.3	17.3
	1	14	10.5	10.5	27.8
	2	32	24.1	24.1	51.9
	3	45	33.8	33.8	85.7
	4	19	14.3	14.3	100.0
	Total	133	100.0	100.0	

Discriminant

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		132	100.0
Excluded	Missing or out-of-range group codes	0	.0
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Total	0	.0
Total		132	100.0

Group Statistics

"Attitude towards e-learning" has positive effect on Organisation learning			
		Valid N (listwise)	
		Unweighted	Weighted
0	Organisation learning can effect on the" Attitude towards e-learning "	18	18.000
	"E-Learning course quality contents " has positive effect on the Continue learning	18	18.000
	Continue learning effect on " ELearning course quality contents"	18	18.000
	" Perceived usefulness" has positive effect on Storage and sharing the knowledge	18	18.000
	Storage and sharing the knowledge effect on perceived usefulness	18	18.000
	"Computer training" affects positively Employee empowerment	18	18.000
	Employee empowerment has effect on the "Computer training"	18	18.000
	"Program flexibility" has effect on Top management	18	18.000
	Top management has positive effect on "program flexibility"	18	18.000
	Organisational learning affect positively "Computer self –efficacy"	18	18.000
	" Computer self –efficacy" has effect on Organisational learning	18	18.000
1	Organisation learning can effect on the" Attitude towards e-learning "	23	23.000
	"E-Learning course quality contents " has positive effect on the Continue learning	23	23.000
	Continue learning effect on " ELearning course quality	23	23.000

	contents”		
	“ Perceived usefulness” has positive effect on Storage and sharing the knowledge	23	23.000
	Storage and sharing the knowledge effect on perceived usefulness	23	23.000
	“Computer training” affects positively Employee empowerment	23	23.000
	Employee empowerment has effect on the “Computer training”	23	23.000
	“Program flexibility” has effect on Top management	23	23.000
	Top management has positive effect on “program flexibility”	23	23.000
	Organisational learning affect positively “Computer self –efficacy”	23	23.000
	“ Computer self –efficacy” has effect on Organisational learning	23	23.000
2	Organisation learning can effect on the” Attitude towards e-learning “	37	37.000
	"E-Learning course quality contents ” has positive effect on the Continue learning	37	37.000
	Continue learning effect on “ ELearning course quality contents”	37	37.000
	“ Perceived usefulness” has positive effect on Storage and sharing the knowledge	37	37.000
	Storage and sharing the knowledge effect on perceived usefulness	37	37.000
	“Computer training” affects positively Employee empowerment	37	37.000
	Employee empowerment has effect on the “Computer training”	37	37.000
	“Program flexibility” has effect on Top management	37	37.000
	Top management has positive effect on “program	37	37.000

	flexibility”		
	Organisational learning affect positively “Computer self –efficacy”	37	37.000
	“ Computer self –efficacy” has effect on Organisational learning	37	37.000
3	Organisation learning can effect on the” Attitude towards e-learning “	37	37.000
	"E-Learning course quality contents ” has positive effect on the Continue learning	37	37.000
	Continue learning effect on “ ELearning course quality contents”	37	37.000
	“ Perceived usefulness” has positive effect on Storage and sharing the knowledge	37	37.000
	Storage and sharing the knowledge effect on perceived usefulness	37	37.000
	“Computer training” affects positively Employee empowerment	37	37.000
	Employee empowerment has effect on the “Computer training”	37	37.000
	“Program flexibility” has effect on Top management	37	37.000
	Top management has positive effect on “program flexibility”	37	37.000
	Organisational learning affect positively “Computer self –efficacy”	37	37.000
	“ Computer self –efficacy” has effect on Organisational learning	37	37.000
4	Organisation learning can effect on the” Attitude towards e-learning “	17	17.000
	"E-Learning course quality contents ” has positive effect on the Continue learning	17	17.000
	Continue learning effect on “ ELearning course quality contents”	17	17.000

	" Perceived usefulness" has positive effect on Storage and sharing the knowledge	17	17.000
	Storage and sharing the knowledge effect on perceived usefulness	17	17.000
	"Computer training" affects positively Employee empowerment	17	17.000
	Employee empowerment has effect on the "Computer training"	17	17.000
	"Program flexibility" has effect on Top management	17	17.000
	Top management has positive effect on "program flexibility"	17	17.000
	Organisational learning affect positively "Computer self –efficacy"	17	17.000
	" Computer self –efficacy" has effect on Organisational learning	17	17.000
Total	Organisation learning can effect on the" Attitude towards e-learning "	132	132.000
	"E-Learning course quality contents " has positive effect on the Continue learning	132	132.000
	Continue learning effect on " ELearning course quality contents"	132	132.000
	" Perceived usefulness" has positive effect on Storage and sharing the knowledge	132	132.000
	Storage and sharing the knowledge effect on perceived usefulness	132	132.000
	"Computer training" affects positively Employee empowerment	132	132.000
	Employee empowerment has effect on the "Computer training"	132	132.000
	"Program flexibility" has effect on Top management	132	132.000
	Top management has positive effect on "program flexibility"	132	132.000

Organisational learning affect positively "Computer self –efficacy"	132	132.000
" Computer self –efficacy" has effect on Organisational learning	132	132.000

Analysis 1

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	6.482(a)	95.1	95.1	.931
2	.153(a)	2.2	97.4	.364
3	.137(a)	2.0	99.4	.347
4	.042(a)	.6	100.0	.202

a. First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.098	285.931	44	.000
2 through 4	.732	38.397	30	.140
3 through 4	.844	20.879	18	.286
4	.959	5.113	8	.745

Standardized Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
Organisation learning can effect on the" Attitude towards e-learning "	.387	-.628	-.049	-.106

"E-Learning course quality contents ” has positive effect on the Continue learning	.239	-.088	-.520	.122
Continue learning effect on “ ELearning course quality contents”	-.091	.131	.545	-.096
“ Perceived usefulness” has positive effect on Storage and sharing the knowledge	-.055	.232	.630	.735
Storage and sharing the knowledge effect on perceived usefulness	.188	-.502	.331	-.038
“Computer training” affects positively Employee empowerment	.270	.074	.318	-.643
Employee empowerment has effect on the “Computer training”	-.007	-.014	-.202	.073
“Program flexibility” has effect on Top management	.293	-.088	-.187	.146
Top management has positive effect on “program flexibility”	.261	.311	.067	-.248
Organisational learning affect positively “Computer self –efficacy”	.142	.043	-.510	.677
“ Computer self –efficacy” has effect on Organisational learning	.266	.652	-.276	-.386

Structure Matrix

	Function			
	1	2	3	4
Organisation learning can effect on the” Attitude towards e-learning “	.576(*)	-.491	-.062	-.071
Top management has positive effect on “program flexibility”	.558(*)	.179	-.090	-.018
“Computer training” affects positively Employee empowerment	.554(*)	.082	.329	-.451
Organisational learning affect positively “Computer self –efficacy”	.502(*)	.061	-.258	.410

"E-Learning course quality contents " has positive effect on the Continue learning	.494(*)	-.056	-.080	.235
Storage and sharing the knowledge effect on perceived usefulness	.478(*)	-.239	.453	.188
"Program flexibility" has effect on Top management	.478(*)	.069	-.014	.224
Employee empowerment has effect on the "Computer training"	.459(*)	.110	.059	-.015
Continue learning effect on " ELearning course quality contents"	.425(*)	.053	.408	.219
" Computer self –efficacy" has effect on Organisational learning	.474	.655(*)	.012	-.051
" Perceived usefulness" has positive effect on Storage and sharing the knowledge	.400	.328	.580(*)	.501

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

"Attitude towards e-learning" has positive effect on Organisation learning				
	Function			
	1	2	3	4
0	-5.729	-.367	.134	-.029
1	-.331	.694	.291	-.182
2	.132	.106	-.563	.056
3	1.530	-.108	.300	.242
4	2.898	-.547	.037	-.371

Unstandardized canonical discriminant functions evaluated at group means

Frequencies

Statistics

		"Attitude towards e-learning" has positive effect on Organisation learning	Organisation learning can effect on the" Attitude towards e-learning "	"E-Learning course quality contents " has positive effect on the Continue learning	Continue learning effect on " ELearning course quality contents"	" Perceived usefulness" has positive effect on Storage and sharing the knowledge	Storage and sharing the knowledge effect on perceived usefulness	"Computer training" affects positively Employee empowerment	Employee empowerment has effect on the "Computer training"	"Program flexibility" has effect on Top management	Top management has positive effect on "program flexibility"	Organisational learning affect positively "Computer self –efficacy"	" Computer self –efficacy" has effect on Organisational learning
N	Valid	132	132	132	132	132	132	132	132	132	132	132	132
	Missing	0	0	0	0	0	0	0	0	0	0	0	0

Frequency Table

"Attitude towards e-learning" has positive effect on Organisation learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	18	13.6	13.6	13.6
	1	23	17.4	17.4	31.1

	2	37	28.0	28.0	59.1
	3	37	28.0	28.0	87.1
	4	17	12.9	12.9	100.0
	Total	132	100.0	100.0	

Organisation learning can effect on the" Attitude towards e-learning "

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	15.2	15.2	15.2
	1	12	9.1	9.1	24.2
	2	39	29.5	29.5	53.8
	3	43	32.6	32.6	86.4
	4	18	13.6	13.6	100.0
	Total	132	100.0	100.0	

"E-Learning course quality contents" has positive effect on the Continual learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	14.4	14.4	14.4
	1	16	12.1	12.1	26.5
	2	28	21.2	21.2	47.7
	3	50	37.9	37.9	85.6
	4	19	14.4	14.4	100.0
	Total	132	100.0	100.0	

Continual learning effect on "ELearning course quality contents"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	17.4	17.4	17.4
	1	13	9.8	9.8	27.3
	2	35	26.5	26.5	53.8
	3	37	28.0	28.0	81.8
	4	24	18.2	18.2	100.0
	Total	132	100.0	100.0	

"Perceived usefulness" has positive effect on Storage and sharing the knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	16.7	16.7	16.7
	1	17	12.9	12.9	29.5
	2	28	21.2	21.2	50.8
	3	39	29.5	29.5	80.3
	4	26	19.7	19.7	100.0
	Total	132	100.0	100.0	

Storage and sharing the knowledge effect on perceived usefulness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	15.2	15.2	15.2
	1	20	15.2	15.2	30.3
	2	34	25.8	25.8	56.1
	3	37	28.0	28.0	84.1

	4	21	15.9	15.9	100.0
	Total	132	100.0	100.0	

“Computer training” affects positively Employee empowerment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.9	15.9	15.9
	1	9	6.8	6.8	22.7
	2	27	20.5	20.5	43.2
	3	58	43.9	43.9	87.1
	4	17	12.9	12.9	100.0
	Total	132	100.0	100.0	

Employee empowerment has effect on the “Computer training”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	15.2	15.2	15.2
	1	14	10.6	10.6	25.8
	2	31	23.5	23.5	49.2
	3	45	34.1	34.1	83.3
	4	22	16.7	16.7	100.0
	Total	132	100.0	100.0	

“Program flexibility” has effect on Top management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	15.2	15.2	15.2

	1	12	9.1	9.1	24.2
	2	31	23.5	23.5	47.7
	3	46	34.8	34.8	82.6
	4	23	17.4	17.4	100.0
	Total	132	100.0	100.0	

Top management has positive effect on "program flexibility"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	18	13.6	13.6	13.6
	1	10	7.6	7.6	21.2
	2	28	21.2	21.2	42.4
	3	52	39.4	39.4	81.8
	4	24	18.2	18.2	100.0
	Total	132	100.0	100.0	

Organisational culture affect positively "Computer self –efficacy"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	14.4	14.4	14.4
	1	12	9.1	9.1	23.5
	2	28	21.2	21.2	44.7
	3	50	37.9	37.9	82.6
	4	23	17.4	17.4	100.0
	Total	132	100.0	100.0	

"Computer self –efficacy" has effect on Organisational culture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	14.4	14.4	14.4
	1	7	5.3	5.3	19.7
	2	32	24.2	24.2	43.9
	3	45	34.1	34.1	78.0
	4	29	22.0	22.0	100.0
	Total	132	100.0	100.0	

Discriminant

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		132	100.0
Excluded	Missing or out-of-range group codes	0	.0
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Total	0	.0
Total		132	100.0

Group Statistics

Attitude towards E-learning "affect positively Organisation learning			
		Valid N (listwise)	
		Unweighted	Weighted
0	"Perceived usefulness "has effect positively on Storage	21	21.000

	and sharing the knowledge		
	Storage and sharing the knowledge effect on" perceived usefulness "	21	21.000
	"Computer training" affect positively Employee empowerment	21	21.000
	Employee empowerment has effect on "Computer training"	21	21.000
	Organisational learning can effect on "Attitude towards e-learning"	21	21.000
	"Program flexibility" has effect on Top management	21	21.000
	Top management has effect on " program flexibility"	21	21.000
	Continues learning has effect on "E-Learning course quality"	21	21.000
	"ELearning course quality contents " affect positively Continues learning	21	21.000
	Employee empowerment has effect on "Computer training"	21	21.000
	Computer training" has effect positively on Employee empowerment	21	21.000
1	"Perceived usefulness "has effect positively on Storage and sharing the knowledge	6	6.000
	Storage and sharing the knowledge effect on" perceived usefulness "	6	6.000
	"Computer training" affect positively Employee empowerment	6	6.000
	Employee empowerment has effect on "Computer training"	6	6.000
	Organisational learning can effect on "Attitude towards e-learning"	6	6.000
	"Program flexibility" has effect on Top management	6	6.000
	Top management has effect on " program flexibility"	6	6.000

	Continues learning has effect on “E-Learning course quality”	6	6.000
	“ELearning course quality contents “ affect positively Continues learning	6	6.000
	Employee empowerment has effect on “Computer training”	6	6.000
	Computer training” has effect positively on Employee empowerment	6	6.000
2	“Perceived usefulness “has effect positively on Storage and sharing the knowledge	33	33.000
	Storage and sharing the knowledge effect on” perceived usefulness “	33	33.000
	“Computer training” affect positively Employee empowerment	33	33.000
	Employee empowerment has effect on “Computer training”	33	33.000
	Organisational learning can effect on “Attitude towards e-learning”	33	33.000
	"Program flexibility” has effect on Top management	33	33.000
	Top management has effect on “ program flexibility”	33	33.000
	Continues learning has effect on “E-Learning course quality”	33	33.000
	“ELearning course quality contents “ affect positively Continues learning	33	33.000
	Employee empowerment has effect on “Computer training”	33	33.000
	Computer training” has effect positively on Employee empowerment	33	33.000
3	“Perceived usefulness “has effect positively on Storage and sharing the knowledge	47	47.000
	Storage and sharing the knowledge effect on” perceived usefulness “	47	47.000

	“Computer training” affect positively Employee empowerment	47	47.000
	Employee empowerment has effect on “Computer training”	47	47.000
	Organisational learning can effect on “Attitude towards e-learning”	47	47.000
	"Program flexibility” has effect on Top management	47	47.000
	Top management has effect on “ program flexibility”	47	47.000
	Continues learning has effect on “E-Learning course quality”	47	47.000
	“ELearning course quality contents “ affect positively Continues learning	47	47.000
	Employee empowerment has effect on “Computer training”	47	47.000
	Computer training” has effect positively on Employee empowerment	47	47.000
4	“Perceived usefulness “has effect positively on Storage and sharing the knowledge	25	25.000
	Storage and sharing the knowledge effect on” perceived usefulness “	25	25.000
	“Computer training” affect positively Employee empowerment	25	25.000
	Employee empowerment has effect on “Computer training”	25	25.000
	Organisational learning can effect on “Attitude towards e-learning”	25	25.000
	"Program flexibility” has effect on Top management	25	25.000
	Top management has effect on “ program flexibility”	25	25.000
	Continues learning has effect on “E-Learning course quality”	25	25.000
	“ELearning course quality contents “ affect positively Continues learning	25	25.000

	Employee empowerment has effect on “Computer training”	25	25.000
	Computer training” has effect positively on Employee empowerment	25	25.000
Total	“Perceived usefulness “has effect positively on Storage and sharing the knowledge	132	132.000
	Storage and sharing the knowledge effect on” perceived usefulness “	132	132.000
	“Computer training” affect positively Employee empowerment	132	132.000
	Employee empowerment has effect on “Computer training”	132	132.000
	Organisational learning can effect on “Attitude towards e-learning”	132	132.000
	"Program flexibility” has effect on Top management	132	132.000
	Top management has effect on “ program flexibility”	132	132.000
	Continues learning has effect on “E-Learning course quality”	132	132.000
	“ELearning course quality contents “ affect positively Continues learning	132	132.000
	Employee empowerment has effect on “Computer training”	132	132.000
	Computer training” has effect positively on Employee empowerment	132	132.000

Analysis 1

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	3.216(a)	84.8	84.8	.873

2	.329(a)	8.7	93.5	.498
3	.195(a)	5.2	98.7	.404
4	.051(a)	1.3	100.0	.220

a First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.142	240.021	44	.000
2 through 4	.599	63.051	30	.000
3 through 4	.796	28.070	18	.061
4	.952	6.111	8	.635

Standardised Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
“Perceived usefulness “has effect positively on Storage and sharing the knowledge	.173	.687	.200	.641
Storage and sharing the knowledge effect on” perceived usefulness “	.067	-.441	.096	.026
“Computer training” affect positively Employee empowerment	.037	-.294	-.077	-.607
Employee empowerment has effect on “Computer training”	.131	.346	-.202	.244
Organisational learning can effect on “Attitude towards e-learning”	.197	-.337	.979	.076
"Program flexibility” has effect on Top management	.170	.499	.009	-.311
Top management has effect on “ program flexibility”	.193	-.526	-.636	.654

Continues learning has effect on “E-Learning course quality”	-.044	.338	-.568	-.211
“ELearning course quality contents “ affect positively Continues learning	.208	.342	.689	.199
Employee empowerment has effect on “Computer training”	.247	-.207	-.188	-.348
Computer training” has effect positively on Employee empowerment	.215	-.300	-.239	-.303

Structure Matrix

	Function			
	1	2	3	4
"Program flexibility” has effect on Top management	.669(*)	.362	-.014	-.198
Computer training” has effect positively on Employee empowerment	.659(*)	-.209	-.140	-.332
Employee empowerment has effect on “Computer training”	.649(*)	.121	-.060	.114
Top management has effect on “ program flexibility”	.645(*)	-.346	-.331	.453
Employee empowerment has effect on “Computer training”	.637(*)	-.028	-.167	-.255
“Computer training” affect positively Employee empowerment	.632(*)	-.060	.001	-.270
Storage and sharing the knowledge effect on” perceived usefulness “	.604(*)	.107	.138	.194
Organisational learning can effect on “Attitude towards e-learning”	.593(*)	-.299	.418	.078
“ELearning course quality contents “ affect positively Continues learning	.581(*)	.205	.210	-.121
“Perceived usefulness “has effect positively on Storage and sharing the knowledge	.569(*)	.393	-.008	.384

Continues learning has effect on “E-Learning course quality”	.512(*)	.345	-.260	-.134

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

Attitude towards E-learning “affect positively Organisation learning				
	Function			
	1	2	3	4
0	-3.899	.225	.140	.073
1	.399	-2.080	1.159	.080
2	.202	-.451	-.659	.043
3	.698	.231	.139	-.260
4	1.600	.470	.212	.351

Unstandardized canonical discriminant functions evaluated at group means

Frequencies

Statistics

		"Perceived usefulness "has effect positively on Storage and sharing the knowledge	Storage and sharing the knowledge effect on" perceived usefulness "	"Computer training" affect positively Employee empowerment	Employee empowerment has effect on "Computer training"	Organisational learning can effect on "Attitude towards e-learning"	Attitude towards E-learning "affect positively Organisation learning	"Program flexibility" has effect on Top management	Top management has effect on " program flexibility"	Continues learning has effect on "E-Learning course quality"	"ELearning course quality contents " affect positively Continues learning	Employee empowerment has effect on "Computer training"	Computer training" has effect positively on Employee empowerment
N	Valid	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320	1320
	Missing	0	0	0	0	0	0	0	0	0	0	0	0

Frequency Table

“Perceived usefulness “has effect positively on Storage and sharing the knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	17.4	17.4	17.4
	1	26	19.7	19.7	37.1
	2	28	21.2	21.2	58.3
	3	33	25.0	25.0	83.3
	4	22	16.7	16.7	100.0
	Total	132	100.0	100.0	

Storage and sharing the knowledge effect on ”perceived usefulness“

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	16.7	16.7	16.7
	1	15	11.4	11.4	28.0
	2	37	28.0	28.0	56.1
	3	36	27.3	27.3	83.3
	4	22	16.7	16.7	100.0
	Total	132	100.0	100.0	

“Computer training” affect positively Employee empowerment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.9	15.9	15.9
	1	5	3.8	3.8	19.7
	2	33	25.0	25.0	44.7
	3	51	38.6	38.6	83.3

	4	22	16.7	16.7	100.0
	Total	132	100.0	100.0	

Employee empowerment has effect on "Computer training"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	15.2	15.2	15.2
	1	11	8.3	8.3	23.5
	2	28	21.2	21.2	44.7
	3	45	34.1	34.1	78.8
	4	28	21.2	21.2	100.0
	Total	132	100.0	100.0	

Organisational learning can effect on "Attitude towards e-learning"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.9	15.9	15.9
	1	9	6.8	6.8	22.7
	2	20	15.2	15.2	37.9
	3	55	41.7	41.7	79.5
	4	27	20.5	20.5	100.0
	Total	132	100.0	100.0	

Attitude towards E-learning "affect positively Organisation learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.9	15.9	15.9

	1	6	4.5	4.5	20.5
	2	33	25.0	25.0	45.5
	3	47	35.6	35.6	81.1
	4	25	18.9	18.9	100.0
	Total	132	100.0	100.0	

"Program flexibility" has effect on Top management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	15.9	15.9	15.9
	1	14	10.6	10.6	26.5
	2	26	19.7	19.7	46.2
	3	51	38.6	38.6	84.8
	4	20	15.2	15.2	100.0
	Total	132	100.0	100.0	

Top management has effect on "program flexibility"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	14.4	14.4	14.4
	1	9	6.8	6.8	21.2
	2	25	18.9	18.9	40.2
	3	50	37.9	37.9	78.0
	4	29	22.0	22.0	100.0
	Total	132	100.0	100.0	

Continual learning has effect on "E-Learning course quality"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	24	18.2	18.2	18.2
	1	18	13.6	13.6	31.8
	2	25	18.9	18.9	50.8
	3	43	32.6	32.6	83.3
	4	22	16.7	16.7	100.0
	Total	132	100.0	100.0	

"ELearning course quality contents "affect positively Continual learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	16.7	16.7	16.7
	1	14	10.6	10.6	27.3
	2	28	21.2	21.2	48.5
	3	39	29.5	29.5	78.0
	4	29	22.0	22.0	100.0
	Total	132	100.0	100.0	

Employee empowerment has effect on "Computer training"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	15.2	15.2	15.2
	1	13	9.8	9.8	25.0
	2	34	25.8	25.8	50.8

	3	44	33.3	33.3	84.1
	4	21	15.9	15.9	100.0
	Total	132	100.0	100.0	

Discriminant

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		133	100.0
Excluded	Missing or out-of-range group codes	0	.0
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Total	0	.0
Total		133	100.0

Group Statistics

"Attitude towards e-learning" effect on Organisation learning		Valid N (listwise)	
		Unweighted	Weighted
0	" Computer self –efficacy" affect positively Organisational learning	23	23.000
	Organisational learning has effect on" Computer self – efficacy"	23	23.000
	Organisation learning effect on "Attitude towards e-learning"	23	23.000
	"E-Learning course quality contents " affect positively Continues learning	23	23.000

	Continues learning effect on "E-Learning course quality"	23	23.000
	"Perceived usefulness" effect on Storage and sharing the knowledge	23	23.000
	Storage and sharing the knowledge effect on "perceived usefulness"	23	23.000
	"Computer training" has appositive effect on Employee empowerment	23	23.000
	Employee empowerment effect on "Computer training"	23	23.000
	Program flexibility effect on the top management	23	23.000
	Top management effect on program flexibility	23	23.000
1	" Computer self –efficacy" affect positively Organisational learning	12	12.000
	Organisational learning has effect on" Computer self – efficacy"	12	12.000
	Organisation learning effect on "Attitude towards e-learning"	12	12.000
	"E-Learning course quality contents " affect positively Continues learning	12	12.000
	Continues learning effect on "E-Learning course quality"	12	12.000
	"Perceived usefulness" effect on Storage and sharing the knowledge	12	12.000
	Storage and sharing the knowledge effect on "perceived usefulness"	12	12.000
	"Computer training" has appositive effect on Employee empowerment	12	12.000
	Employee empowerment effect on "Computer training"	12	12.000
	Program flexibility effect on the top management	12	12.000
	Top management effect on program flexibility	12	12.000
2	" Computer self –efficacy" affect positively Organisational learning	25	25.000

	Organisational learning has effect on" Computer self – efficacy"	25	25.000
	Organisation learning effect on "Attitude towards e-learning"	25	25.000
	"E-Learning course quality contents " affect positively Continues learning	25	25.000
	Continues learning effect on "E-Learning course quality"	25	25.000
	"Perceived usefulness" effect on Storage and sharing the knowledge	25	25.000
	Storage and sharing the knowledge effect on "perceived usefulness"	25	25.000
	"Computer training" has appositive effect on Employee empowerment	25	25.000
	Employee empowerment effect on "Computer training"	25	25.000
	Program flexibility effect on the top management	25	25.000
	Top management effect on program flexibility	25	25.000
3	" Computer self –efficacy" affect positively Organisational learning	49	49.000
	Organisational learning has effect on" Computer self – efficacy"	49	49.000
	Organisation learning effect on "Attitude towards e-learning"	49	49.000
	"E-Learning course quality contents " affect positively Continues learning	49	49.000
	Continues learning effect on "E-Learning course quality"	49	49.000
	"Perceived usefulness" effect on Storage and sharing the knowledge	49	49.000
	Storage and sharing the knowledge effect on "perceived usefulness"	49	49.000
	"Computer training" has appositive effect on Employee	49	49.000

	empowerment		
	Employee empowerment effect on “Computer training”	49	49.000
	Program flexibility effect on the top management	49	49.000
	Top management effect on program flexibility	49	49.000
4	“ Computer self –efficacy” affect positively Organisational learning	24	24.000
	Organisational learning has effect on” Computer self – efficacy”	24	24.000
	Organisation learning effect on “Attitude towards e-learning”	24	24.000
	“E-Learning course quality contents “ affect positively Continues learning	24	24.000
	Continues learning effect on “E-Learning course quality”	24	24.000
	“Perceived usefulness” effect on Storage and sharing the knowledge	24	24.000
	Storage and sharing the knowledge effect on “perceived usefulness”	24	24.000
	“Computer training” has appositive effect on Employee empowerment	24	24.000
	Employee empowerment effect on “Computer training”	24	24.000
	Program flexibility effect on the top management	24	24.000
	Top management effect on program flexibility	24	24.000
Total	“ Computer self –efficacy” affect positively Organisational learning	133	133.000
	Organisational learning has effect on” Computer self – efficacy”	133	133.000
	Organisation learning effect on “Attitude towards e-learning”	133	133.000
	“E-Learning course quality contents “ affect positively Continues learning	133	133.000

Continues learning effect on "E-Learning course quality"	133	133.000
"Perceived usefulness" effect on Storage and sharing the knowledge	133	133.000
Storage and sharing the knowledge effect on "perceived usefulness"	133	133.000
"Computer training" has appositive effect on Employee empowerment	133	133.000
Employee empowerment effect on "Computer training"	133	133.000
Program flexibility effect on the top management	133	133.000
Top management effect on program flexibility	133	133.000

Analysis 1

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	5.455(a)	87.4	87.4	.919
2	.445(a)	7.1	94.5	.555
3	.214(a)	3.4	97.9	.420
4	.128(a)	2.1	100.0	.337

a. First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.078	315.870	44	.000
2 through 4	.505	84.629	30	.000
3 through 4	.730	38.976	18	.003
4	.886	14.961	8	.060

Structure Matrix

	Function			
	1	2	3	4
Employee empowerment effect on "Computer training"	.626(*)	-.372	-.265	-.236
Organisational learning has effect on" Computer self –efficacy"	.584(*)	.127	.465	-.240
Program flexibility effect on the top management	.584(*)	-.238	-.139	.005
Top management effect on program flexibility	.572(*)	.533	-.199	.093
" Computer self –efficacy" affect positively Organisational learning	.565(*)	-.424	.336	-.121
"Computer training" has appositive effect on Employee empowerment	.552(*)	.013	-.006	-.166
Organisation learning effect on "Attitude towards e-learning"	.551(*)	.188	.185	.258
Continues learning effect on "E-Learning course quality"	.489(*)	-.194	-.175	.016
"Perceived usefulness" effect on Storage and sharing the knowledge	.477(*)	-.108	.053	.247
Storage and sharing the knowledge effect on "perceived usefulness"	.456(*)	-.057	-.091	.176
"E-Learning course quality contents " affect positively Continues learning	.481	-.234	.226	.553(*)

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

"Attitude towards e-learning" effect on Organisation learning	Function			
	1	2	3	4
0	-4.716	-.307	.219	.108
1	-.514	2.042	.135	-.161
2	.363	-.007	-.868	.279
3	1.015	-.304	.041	-.400
4	2.326	-.099	.544	.503

Unstandardized canonical discriminant functions evaluated at group means

Frequencies

Statistics

		" Computer self –efficacy" affect positively Organisational learning	Organisational learning has effect on" Computer self –efficacy"	"Attitude towards e-learning" effect on Organisation learning	Organisation learning effect on "Attitude towards e-learning"	"E-Learning course quality contents " affect positively Continues learning	Continues learning effect on "E-Learning course quality"	"Perceived usefulness" effect on Storage and sharing the knowledge	Storage and sharing the knowledge effect on "perceived usefulness"	"Computer training" has appositive effect on Employee empowerment	Employee empowerment effect on "Computer training"	Program flexibility effect on the top management	Top management effect on program flexibility
N	Valid	133	133	133	133	133	133	133	133	133	133	133	133
	Missing	0	0	0	0	0	0	0	0	0	0	0	0

Frequency Table

"Computer self –efficacy" affect positively Organisational culture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	24	18.0	18.0	18.0
	1	17	12.8	12.8	30.8

	2	32	24.1	24.1	54.9
	3	37	27.8	27.8	82.7
	4	23	17.3	17.3	100.0
	Total	133	100.0	100.0	

Organisational culture has effect on" Computer self –efficacy"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	17.3	17.3	17.3
	1	10	7.5	7.5	24.8
	2	31	23.3	23.3	48.1
	3	44	33.1	33.1	81.2
	4	25	18.8	18.8	100.0
	Total	133	100.0	100.0	

"Attitude towards e-learning" effect on Organisation learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	17.3	17.3	17.3
	1	12	9.0	9.0	26.3
	2	25	18.8	18.8	45.1
	3	49	36.8	36.8	82.0
	4	24	18.0	18.0	100.0
	Total	133	100.0	100.0	

Organisation learning effect on "Attitude towards e-learning"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	19.5	19.5	19.5
	1	7	5.3	5.3	24.8
	2	21	15.8	15.8	40.6
	3	53	39.8	39.8	80.5
	4	26	19.5	19.5	100.0
	Total	133	100.0	100.0	

"E-Learning course quality contents" affect positively Continues learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	28	21.1	21.1	21.1
	1	17	12.8	12.8	33.8
	2	24	18.0	18.0	51.9
	3	30	22.6	22.6	74.4
	4	34	25.6	25.6	100.0
	Total	133	100.0	100.0	

Continual learning effect on "E-Learning course quality"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	28	21.1	21.1	21.1
	1	13	9.8	9.8	30.8
	2	31	23.3	23.3	54.1
	3	36	27.1	27.1	81.2

	4	25	18.8	18.8	100.0
	Total	133	100.0	100.0	

“Perceived usefulness” effect on Storage and sharing the knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	19.5	19.5	19.5
	1	15	11.3	11.3	30.8
	2	34	25.6	25.6	56.4
	3	31	23.3	23.3	79.7
	4	27	20.3	20.3	100.0
	Total	133	100.0	100.0	

Storage and sharing the knowledge effect on “perceived usefulness”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	27	20.3	20.3	20.3
	1	15	11.3	11.3	31.6
	2	22	16.5	16.5	48.1
	3	39	29.3	29.3	77.4
	4	30	22.6	22.6	100.0
	Total	133	100.0	100.0	

“Computer training” has appositive effect on Employee empowerment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	27	20.3	20.3	20.3

	1	7	5.3	5.3	25.6
	2	24	18.0	18.0	43.6
	3	39	29.3	29.3	72.9
	4	36	27.1	27.1	100.0
	Total	133	100.0	100.0	

Employee empowerment effect on "Computer training"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	24	18.0	18.0	18.0
	1	10	7.5	7.5	25.6
	2	30	22.6	22.6	48.1
	3	54	40.6	40.6	88.7
	4	15	11.3	11.3	100.0
	Total	133	100.0	100.0	

Program flexibility effect on the top management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	19.5	19.5	19.5
	1	13	9.8	9.8	29.3
	2	27	20.3	20.3	49.6
	3	51	38.3	38.3	88.0
	4	16	12.0	12.0	100.0
	Total	133	100.0	100.0	

Top management effect on program flexibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	16.5	16.5	16.5
	1	7	5.3	5.3	21.8
	2	23	17.3	17.3	39.1
	3	48	36.1	36.1	75.2
	4	33	24.8	24.8	100.0
	Total	133	100.0	100.0	

Discriminant

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		133	100.0
Excluded	Missing or out-of-range group codes	0	.0
	At least one missing discriminating variable	0	.0
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	.0
	Total	0	.0
Total		133	100.0

Group Statistics

"Attitude towards e-learning" affect positively Organisation learning		Valid N (listwise)	
		Unweighted	Weighted
0	"E-Learning course quality contents" affects positively Continues learning	25	25.000

	Continues learning effect on" E-Learning course quality"	25	25.000
	"Perceived usefulness" has effect on Storage and sharing the knowledge	25	25.000
	Storage and sharing the knowledge effect on "perceived usefulness"	25	25.000
	"Computer training" affect positively Employee empowerment	25	25.000
	Employee empowerment has effect on "Computer training"	25	25.000
	Organisation learning effect on "Attitude towards e-learning"	25	25.000
	Organisational learning effect on "Computer self – efficacy"	25	25.000
	"Computer self -efficacy " has appositive effect on Organisational learning	25	25.000
	Top management effect on "program flexibility"	25	25.000
	"Program flexibility" has effect on Top management	25	25.000
1	"E-Learning course quality contents" affects positively Continues learning	13	13.000
	Continues learning effect on" E-Learning course quality"	13	13.000
	"Perceived usefulness" has effect on Storage and sharing the knowledge	13	13.000
	Storage and sharing the knowledge effect on "perceived usefulness"	13	13.000
	"Computer training" affect positively Employee empowerment	13	13.000
	Employee empowerment has effect on "Computer training"	13	13.000
	Organisation learning effect on "Attitude towards e-learning"	13	13.000
	Organisational learning effect on "Computer self – efficacy"	13	13.000

	"Computer self -efficacy " has appositive effect on Organisational learning	13	13.000
	Top management effect on "program flexibility"	13	13.000
	"Program flexibility" has effect on Top management	13	13.000
2	"E-Learning course quality contents" affects positively Continues learning	19	19.000
	Continues learning effect on" E-Learning course quality"	19	19.000
	"Perceived usefulness" has effect on Storage and sharing the knowledge	19	19.000
	Storage and sharing the knowledge effect on "perceived usefulness"	19	19.000
	"Computer training" affect positively Employee empowerment	19	19.000
	Employee empowerment has effect on "Computer training"	19	19.000
	Organisation learning effect on "Attitude towards e-learning"	19	19.000
	Organisational learning effect on "Computer self – efficacy"	19	19.000
	"Computer self -efficacy " has appositive effect on Organisational learning	19	19.000
	Top management effect on "program flexibility"	19	19.000
	"Program flexibility" has effect on Top management	19	19.000
3	"E-Learning course quality contents" affects positively Continues learning	52	52.000
	Continues learning effect on" E-Learning course quality"	52	52.000
	"Perceived usefulness" has effect on Storage and sharing the knowledge	52	52.000
	Storage and sharing the knowledge effect on "perceived usefulness"	52	52.000
	"Computer training" affect positively Employee empowerment	52	52.000

	Employee empowerment has effect on "Computer training"	52	52.000
	Organisation learning effect on "Attitude towards e-learning"	52	52.000
	Organisational learning effect on "Computer self – efficacy"	52	52.000
	"Computer self -efficacy " has appositive effect on Organisational learning	52	52.000
	Top management effect on "program flexibility"	52	52.000
	"Program flexibility" has effect on Top management	52	52.000
4	"E-Learning course quality contents" affects positively Continues learning	24	24.000
	Continues learning effect on" E-Learning course quality"	24	24.000
	"Perceived usefulness" has effect on Storage and sharing the knowledge	24	24.000
	Storage and sharing the knowledge effect on "perceived usefulness"	24	24.000
	"Computer training" affect positively Employee empowerment	24	24.000
	Employee empowerment has effect on "Computer training"	24	24.000
	Organisation learning effect on "Attitude towards e-learning"	24	24.000
	Organisational learning effect on "Computer self – efficacy"	24	24.000
	"Computer self -efficacy " has appositive effect on Organisational learning	24	24.000
	Top management effect on "program flexibility"	24	24.000
	"Program flexibility" has effect on Top management	24	24.000
Total	"E-Learning course quality contents" affects positively Continues learning	133	133.000
	Continues learning effect on" E-Learning course quality"	133	133.000

"Perceived usefulness" has effect on Storage and sharing the knowledge	133	133.000
Storage and sharing the knowledge effect on "perceived usefulness"	133	133.000
"Computer training" affect positively Employee empowerment	133	133.000
Employee empowerment has effect on "Computer training"	133	133.000
Organisation learning effect on "Attitude towards e-learning"	133	133.000
Organisational learning effect on "Computer self – efficacy"	133	133.000
"Computer self -efficacy " has appositive effect on Organisational learning	133	133.000
Top management effect on "program flexibility"	133	133.000
"Program flexibility" has effect on Top management	133	133.000

Analysis 1

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	4.567(a)	93.1	93.1	.906
2	.200(a)	4.1	97.2	.408
3	.089(a)	1.8	99.0	.286
4	.047(a)	1.0	100.0	.212

a First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.131	251.840	44	.000
2 through 4	.730	38.958	30	.127
3 through 4	.877	16.324	18	.570
4	.955	5.707	8	.680

Standardized Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
"E-Learning course quality contents" affects positively Continues learning	.093	.424	.040	-.076
Continues learning effect on" E-Learning course quality"	-.170	-.814	.404	-.179
"Perceived usefulness" has effect on Storage and sharing the knowledge	.183	.418	-.230	-.502
Storage and sharing the knowledge effect on "perceived usefulness"	-.135	.260	-.121	1.026
"Computer training" affect positively Employee empowerment	.508	-.696	-.102	.367
Employee empowerment has effect on "Computer training"	-.054	.021	-.114	-.006
Organisation learning effect on "Attitude towards e-learning"	.289	.570	-.361	-.154
Organisational learning effect on "Computer self –efficacy"	.280	.336	-.103	.225
"Computer self -efficacy " has appositive effect on Organisational learning	.190	-.499	-.753	-.494
Top management effect on "program	.105	.300	.778	-.208

flexibility"				
"Program flexibility" has effect on Top management	.299	-.155	.605	.181

Structure Matrix

	Function			
	1	2	3	4
"Computer training" affect positively Employee empowerment	.698(*)	-.349	-.065	.339
Top management effect on "program flexibility"	.628(*)	.187	.382	-.135
Organisation learning effect on "Attitude towards e-learning"	.615(*)	.301	-.034	.030
"Computer self -efficacy " has appositive effect on Organisational learning	.590(*)	-.200	-.349	-.315
Organisational learning effect on "Computer self –efficacy"	.579(*)	.202	-.194	.112
"Program flexibility" has effect on Top management	.515(*)	-.035	.458	-.042
"Perceived usefulness" has effect on Storage and sharing the knowledge	.490(*)	.271	-.179	-.095
Continues learning effect on" E-Learning course quality"	.474(*)	-.221	.111	.063
Employee empowerment has effect on "Computer training"	.468(*)	.091	-.124	.175
"E-Learning course quality contents" affects positively Continues learning	.462(*)	.041	.082	-.039
Storage and sharing the knowledge effect on "perceived usefulness"	.394	.171	-.174	.624(*)

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

* Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

"Attitude towards e-learning" affect positively Organisation learning				
	Function			
	1	2	3	4
0	-4.102	-.164	-.168	-.034
1	-.680	.426	.458	.510
2	.577	.954	-.094	-.223
3	.983	-.299	.219	-.120
4	2.054	-.167	-.472	.196

Unstandardized canonical discriminant functions evaluated at group means

Frequencies

Statistics

		positively Continues learning	quality"	sharing the knowledge	"perceived usefulness"	empowerment	"Computer training"	e-learning"	Organisation learning	efficacy"	Organisational learning	Top management effect on "program flexibility"	management
N	Valid	133	133	133	133	133	133	133	133	133	133	133	133
	Missing	0	0	0	0	0	0	0	0	0	0	0	0

Frequency Table

“E-Learning course quality contents” affects positively Continual learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	23	17.3	17.3	17.3
	1	22	16.5	16.5	33.8
	2	28	21.1	21.1	54.9
	3	36	27.1	27.1	82.0
	4	24	18.0	18.0	100.0
	Total	133	100.0	100.0	

Continual learning effect on ”E-Learning course quality”

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	19.5	19.5	19.5
	1	14	10.5	10.5	30.1
	2	28	21.1	21.1	51.1
	3	41	30.8	30.8	82.0
	4	24	18.0	18.0	100.0
	Total	133	100.0	100.0	

“Perceived usefulness” has effect on Storage and sharing the knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	19.5	19.5	19.5
	1	12	9.0	9.0	28.6
	2	32	24.1	24.1	52.6
	3	38	28.6	28.6	81.2

	4	25	18.8	18.8	100.0
	Total	133	100.0	100.0	

Storage and sharing the knowledge effect on "perceived usefulness"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	29	21.8	21.8	21.8
	1	16	12.0	12.0	33.8
	2	32	24.1	24.1	57.9
	3	34	25.6	25.6	83.5
	4	22	16.5	16.5	100.0
	Total	133	100.0	100.0	

"Computer training" affect positively Employee empowerment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	24	18.0	18.0	18.0
	1	15	11.3	11.3	29.3
	2	25	18.8	18.8	48.1
	3	47	35.3	35.3	83.5
	4	22	16.5	16.5	100.0
	Total	133	100.0	100.0	

Employee empowerment has effect on "Computer training"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	25	18.8	18.8	18.8

	1	13	9.8	9.8	28.6
	2	28	21.1	21.1	49.6
	3	38	28.6	28.6	78.2
	4	29	21.8	21.8	100.0
	Total	133	100.0	100.0	

Organisation learning effect on "Attitude towards e-learning"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	25	18.8	18.8	18.8
	1	3	2.3	2.3	21.1
	2	37	27.8	27.8	48.9
	3	41	30.8	30.8	79.7
	4	27	20.3	20.3	100.0
	Total	133	100.0	100.0	

"Attitude towards e-learning" affect positively Organisation learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	25	18.8	18.8	18.8
	1	13	9.8	9.8	28.6
	2	19	14.3	14.3	42.9
	3	52	39.1	39.1	82.0
	4	24	18.0	18.0	100.0
	Total	133	100.0	100.0	

Organisational culture effect on "Computer self –efficacy"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	24	18.0	18.0	18.0
	1	8	6.0	6.0	24.1
	2	38	28.6	28.6	52.6
	3	43	32.3	32.3	85.0
	4	20	15.0	15.0	100.0
	Total	133	100.0	100.0	

"Computer self-efficacy" has appositive effect on Organisational culture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	24	18.0	18.0	18.0
	1	12	9.0	9.0	27.1
	2	30	22.6	22.6	49.6
	3	46	34.6	34.6	84.2
	4	21	15.8	15.8	100.0
	Total	133	100.0	100.0	

Top management effect on "program flexibility"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	16.5	16.5	16.5
	1	5	3.8	3.8	20.3
	2	26	19.5	19.5	39.8

	3	55	41.4	41.4	81.2
	4	25	18.8	18.8	100.0
	Total	133	100.0	100.0	

“Program flexibility” has effect on Top management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	25	18.8	18.8	18.8
	1	5	3.8	3.8	22.6
	2	31	23.3	23.3	45.9
	3	47	35.3	35.3	81.2
	4	25	18.8	18.8	100.0
	Total	133	100.0	100.0	