

**An-Najah National University**

**Faculty of Graduate Studies**

**An Integrative Framework for Corporate Strategic  
Professional Development Using E-Learning**

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# **An Integrative Framework for Corporate Strategic Professional Development Using E-Learning**

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## **Dedication**

I would like to dedicate this master thesis for the individuals who had most affected my personality and resulted with the person who I am now.

I start with my beloved parents, who had the most effect on me, my personality and the way I think. To my father and my mother, I owe you the air I am breathing on every second.

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انا الموقع ادناه مقدم الرسالة التي تحمل العنوان:

## **An Integrative Framework for Corporate Strategic Professional Development Using E-Learning**

أقر بأن ما اشتملت عليه هذه الرسالة إنما هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيث ورد، وأن هذه الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل أية درجة علمية أو لقب علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

### **Declaration**

The work provided in this thesis, unless otherwise references, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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## List of Abbreviations

| <b>Abbreviation</b> | <b>Explanations</b>                                  |
|---------------------|------------------------------------------------------|
| <b>HRM</b>          | Human resources Management                           |
| <b>HR</b>           | Human Resources                                      |
| <b>HRD</b>          | Human resources Department                           |
| <b>PD</b>           | Professional Development                             |
| <b>CBL</b>          | Competency based learning                            |
| <b>CBT</b>          | Computer based training                              |
| <b>SME</b>          | Small to medium enterprise                           |
| <b>LO</b>           | Learning object                                      |
| <b>LOM</b>          | Learning Object Metadata                             |
| <b>IEEE</b>         | Institute of Electrical and Electronics Engineers    |
| <b>SCORM</b>        | Sharable content object reference model              |
| <b>ADL</b>          | Advanced Distributed Learning                        |
| <b>LMS</b>          | Learning management system                           |
| <b>xAPI</b>         | Experience API.                                      |
| <b>MOODLE</b>       | Modular Object Oriented Dynamic Learning Environment |
| <b>KM</b>           | Knowledge management                                 |
| <b>RCD</b>          | Redistributable competency definition                |
| <b>KPI</b>          | Key performance indicators                           |
| <b>CBeL</b>         | Competency based e-Learning                          |
| <b>CMM</b>          | Capability & Maturity Model                          |
| <b>eMM</b>          | eLearning Maturity Model                             |
| <b>CPs</b>          | Competencies                                         |

**An Integrative Framework for Corporate Strategic Professional  
Development Using E-Learning**

**By**

**Wafa Nabeel Adham**

**Supervisor**

**Dr. Ayham Jaroon**

**Abstract**

In this study, the implementation of a competency based e-learning (CBeL) was investigated, and factors that affects its success were explored. An exploratory single case study with a mixed methodology was performed. An International multi-branch corporate who implemented an e-learning program that uses competency based approaches in the last six years were selected as the case of this study. The study was performed in two phases, in the first phase (Phase I), interviews were conducted with eight managers and twelve learners to record the difficulties they had during the program period. A survey tool of best practices was then developed based on the responses results of the first phase combined with the literature. In the second phase (Phase II), the survey tool was then used to collect feedback from thirty human resource managers and trainers about these proposed practices.

As a result of this study, a new CBeL framework was introduced. The framework describes three main stages at which HR departments should envision while implementing a competency based e-learning programs: (Preparation, Implementation and Optimization). Each of these stages

incorporate a set of practices that facilitate the implementation of a strategic CBeL process that can be evaluated.

# **Chapter 1**

## **Introduction**

### **1.1 Overview**

In the last two decades, the emergence of e-learning has been influencing both the higher education and corporates development. A recent report published by Docebo (2017) shows the forecast that current size of e-learning market is estimated to be over \$165 Billion in 2016 and is likely to grow by 5% between 2016 and 2023, exceeding \$240 Billion. This shows the increasing awareness about the role of e-Learning in helping organizations to achieve top management dynamic strategies.

It's not a surprise that corporates are now much more involved into using e-learning to drive their employees' professional development, given that the usage of e-learning reduces corporates spending by great deal. Hall and LeCavalier (2000b) highlighted early figures on this matter, "IBM saved US \$200 million in 1999, providing five times the learning at one-third the cost of their previous methods. Using a blend of Web-based (80%) and classroom (20%) instruction, Ernst and Young reduced greatly the training costs by 35% while improving consistency and scalability, (Strother, 2002).

As the market competition increases and product lifecycle is shortening, the organizations find themselves on a frequent need to upgrade their employees' skill sets. This have put more and more pressure on the Learning and Development (L&D) departments to adapt the current learning materials and implement new training strategies. Big investments

were made by companies to improve their internal online training portals, these improvements not only were focused on the learning content but also on maximizing the role of Human Resources Department (HRD) and its efficiency in driving e-learning as a strategic training tool. On the other hand, several e-learning implementations were adopted, these implementations vary from simple implementations where corporate make their learning materials available online to more advanced implementations where learning plans are set per employee.

The word “Competency” describes an observable and measurable behaviors of the person that make measuring performance possible (Dessler, 2013). Competency based management, is a well-known term in the human resources (HR) world. The competency based approaches allows the integration of the HR strategies with the overall organization vision and mission. This can be done through the assessment of the current organization human resources competencies and the proper planning for the capacities needed to achieve organizations goals.

This study comes to explore such implementations and focuses on the practical experiences, as well as the difficulties that faces these companies while applying e-learning in a competency based environment. The study focuses on getting a direct feedback from the learners, managers and trainers on their experience using e-learning as a tool for professional development. The study also introduces a new framework (CBeL Framework) that helps implementation of e-learning in a competency based environment.

### 1.1.1 E-Learning

In the past two decades the use of “e-learning” also called “Educational Technology” has been increasing tremendously as a mean of delivering online training content. Reviewing the literature over the word “e-learning” it’s apparent that there have been several definitions and terminologies over this word, this contributes to conflicting findings about distance learning, e-learning, and online learning environments (Moore and Galyen, 2010), some researchers have used the word e-learning interchangeably with the words like “online-learning”, “web-learning”

The use of e-learning in corporations started in the beginning of 21<sup>st</sup> century. The term “Corporate University” describes the corporate entity that helps achieving the organization goals through the conduction of learning activities, this can be done through the contribution of overall individual and organization knowledge (Macpherson, Homan, and Wilkinson, 2004). “Corporate universities are considered to be one of the most significant business interventions in organizational development in the last two decades” (Dealtry, 2001). In today’s organizations, the implementation of e-learning is varying depending on the size, culture, and maturity of the organization. Walton (1999) has categorized corporate universities into three generations, the *first generation* with a limited focus on the organization culture and values, and mainly the implantation is classroom like activities, the *second generation* offers a wider range of online based activities incorporating areas of improving personal skills, cultural issues and remedial learning. The *third generation* of corporate

universities are those who make the best use of available technologies as a mean of learning and delivering the learning content.

Despite the consensus on the multi facet nature of e-learning, researchers have never been achieved any on its dimensions, Khan (2003) has published the e-learning framework in response to readers about web based instructions, the model has defined 8 dimensions for e-learning implementations (Pedagogical, Technology, interface design, evaluation, management, resource support, ethical, and institutional). On contrast, Varlamis<sup>1</sup> & Apostolakis (2011), in an effort to evaluate e-learning have proposed four main dimensions (Pedagogical, Technical, Social, Organizational).

### **1.1.2 Professional Development and Competency Based Approaches**

It's well known that the role of the human resources department (HRD) is crucial for the success of any organization, one important function of any HRD is the training and development. Researchers have emphasized on the strategic role of the HRD learning and development function in achieving organization goals.

**Professional development** is defined as: “The learning to earn or maintain professional credentials such as academic degrees to formal coursework, conferences, and informal learning opportunities situated in practice”. It has been described as intensive and collaborative, ideally incorporating an evaluative stage (Speck and Knipe, 2005).

Organization strategic plans should ultimately govern its training goals (Dessler, 2013), the HRD helps in executing the organization strategic plans by identifying the employees competencies and behaviors required to achieve the organizational goals. Also, the HRD is responsible for setting the training required to improve these competencies. Researchers have found that training has an impressive record of influencing the total organization performance as described by (Sugrue, 2005).

Figure 1.1 draws the path between the organization strategy down to its training implementation and evaluation as described by (Dessler, 2013).

|                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------|
| Strategy → Employee Behaviors → Employee Competencies → Training and Development<br>Needs → Training Implementation and Evaluation |
|------------------------------------------------------------------------------------------------------------------------------------|

**Figure 1.1:** Connection between organization strategies with training and evaluation, (Dessler, 2013).

For organizations to easily identify their staff needs, competency models are used. The modern competency-based education and training movements began in the united states with the efforts to reform teacher education and training in the 1960s (Brown, 1994; Hodges & Harris, 2012; and Tuxworth, 1994/1989), Brown (1994) has traced down a sequential progress of the competency based model and stated that the model presented in 1980 and early 1990's represented the fourth and fifth generations.

As brown historical record states that the *first generation* was largely informed by the Australian' competency based vocational education model – the application of scientific management to the work roles. The *second generation* was the development of mastery learning in US, during the 1920s and 1930s, while *the third generation* of the competency based learning was concerned with the formative vocational education. The *fourth generation* has appeared with more emphasis on the word “competency” in US where they moved behind the vocational learning to education.

Jones and Voorhees (2002) have analyzed the fourth and *fifth generation* of the competency models, targeting adult learners in US. Klein-Collins (2013) has investigated how the advancement of the new technologies and the widespread of online learning technologies have helped in the arrival of the sixth generation competency based learning (CBL), the current direction taken in the implanting of CBL is taking three main forms as the Klein-Collins observed: the *first* is embedding competency-based assessments into a traditional curriculum, the *second* is redesigning the curriculum entirely around competencies; and the *third* is redesigning the credentialing process around competency-based assessments, also known as direct assessment.

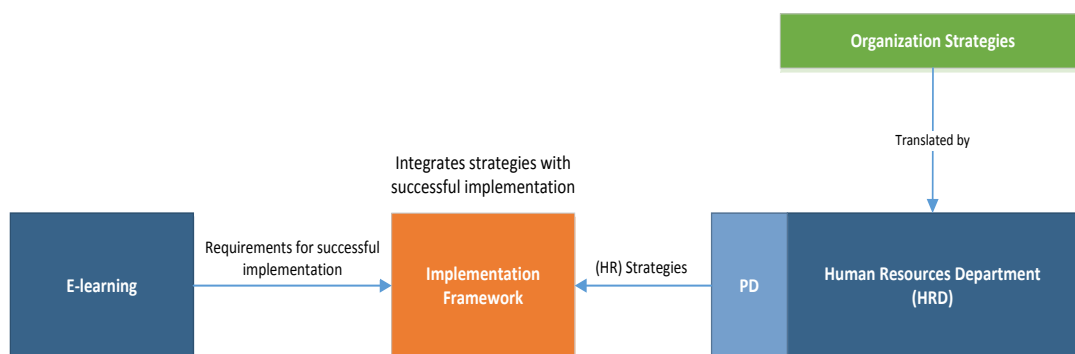
## **1.2 Research Problem**

Companies have been using e-learning as a tool for improving their employees' skills since the invention of personal computers. The

implementation of e-learning in corporates has never been a smooth process. It has been reported by several researchers that the implementation is full of challenges despite the budgets and efforts that were given. Several difficulties were reported related to inability for organization to assess the e-learning program efficiency.

On the other hand, corporates are also investing more and more in their Competency based human resource management systems. Despite the vast efforts a gap still exists when it comes to strategic implementation of e-learning in a competency based environment. This gap affects the professional development efficiency, and reduces the ability of the organization HR planning and forecasting.

The aim of this research is to explore deeply the implementation problems that faces learners, trainer and managers during the implementation of their competency based e-learning. It also aims to produce an implementation framework that can help corporates to implement e-learning that takes in consideration the organization's competency based strategic needs. Figure 1.2 shows the role of such framework and its strategic relation.



**Figure 1.2:** Relation of the framework with e-learning and Professional development.

### **1.3 Research Questions**

The research questions can be summarized as follows:

- What are the main difficulties that corporates face while trying to implement a competency based e-learning programs.
- What are the factors affecting a successful implementation of a competency based e-learning programs in corporates.

### **1.4 Research Objectives**

1. Identifying the main factors affecting a successful implementation of e-learning in corporations.
2. Exploring the relationship between different factors affecting successful implementation of e-learning in corporations.
3. Investigating the difficulties that accompanying the implementation of e-learning in corporations and suggests possible interventions.

### **1.5 Significance of the Study**

Such a framework will enable the HRD gain better overview about their organization training needs, also, it will help the HRD plan better on the long run while being aligned with the organization strategy.

The framework can be considered as a reference for corporates who implement a competency based e-learning programs. The framework can

be also used to conclude possible software prototype that may form a strong strategic decision-making asset.

## **1.6 Thesis Structure**

This thesis is divided into five main chapters. The first chapter represents the introduction about the study, its objectives and its significance. The second chapter covers the literature about two main study topics: e-Learning, and competency based approaches in corporations. Literature that supports the need for this study is presented. Chapter three presents the research methodology and approach that was followed. Chapter four presents the study results and discusses the findings for each of the research phases, in this fourth chapter the competency based e-learning (CBeL) framework is also presented. Finally, in Chapter five, conclusions, recommendations and study limitations are presented.

## **Chapter 2**

### **Literature Review**

#### **2.1 Overview**

This chapter presents an overview of previous research on two main topics: e-learning and competency based approaches. The first section presents an overview about using e-learning in corporates and the possible implementation challenges that faced companies over the past years. The second section is a review of human resources professional development from a strategic point of view. More specifically, the use of competency-based approaches in corporates is explored. Finally, the chapter is concluded by providing an account on integrating e-learning and competency-based trainings.

#### **2.2 E-Learning**

In the past four decades, researches about e-learning have varied in focus and breadth and depth of the e-learning concepts. This variation was attributed to several factors including the short life cycle of technological innovations making up the base for education (Cox, 2010). Looking back into the history of using technology in education, the roots go back to the invention of personal computers in late 1970's and 1980's. In this period, giant computer vendors launched the personal computing era bringing new opportunities for using computers in business, education, and industry. The development of internet has also played an important role in amplifying these opportunities. According to Stallings (2002), the rise of internet age

was traced back to the Advanced Research Projects Agency Network (ARPANET) which connected several computer networks and research laboratories in United states. Later on, the linking of commercial enterprises private networks in early 1990's marking the beginning of the transition to the modern internet (Peter, 2004). Table 2.1 shows the progressive advancement in technologies that played an important role in improving the use of technology in education as introduced by Cox (2010)

**Table 2.1: Technological developments available to education (based on Cox 2010, p. 144).**

|           |                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1968      | <i>The creation of the Internet – ARPANET</i>                                                                                                                                                                                                                                                                                                                                                                   |
| 1970–1977 | Real-time interactive computers User graphics online computer terminals available at £5000 Internet connections for some schools via telecom lines and modems Remote access to computers from different locations International networks of computers through (JANET Joint Academic Network) Forerunners of desktop computers: e.g. Hewlett Packard, Horizon (formal and informal settings)                     |
| 1977–1980 | Miniaturization of computers and components – Production of small desktop computers: Horizon – £5000, Apple II – £1000, RML 380z £2000, IBM series – £2000 Acorn atom computer, Acorn BBC – Model A (8 k of memory) Acorn BBC model B (32 k of memory) – £400 Move from tape-based storage to disk-based storage of computer programs Prestel/Teletext – commercial and educational information provided online |
| 1980–1984 | First Apple-Macintosh produced – £1500 Fibre optics facilitating fast and large scale communication Expanding range of input and output devices for education, including: Concept keyboard/graphics tablets; Quinkey keyboard; Robot turtle; Tracker ball; Touch screens Speech input and output                                                                                                                |
| 1985–1987 | Microsoft windows launched More powerful cheaper personal microcomputers IBM PC – (256 k of storage memory, 32 k processor memory) £1500 Mac II – (256 k of storage memory, 32 k processor memory) £1000 Invention of the World Wide Web by Tim Berners-Lee                                                                                                                                                     |
| 1987–1990 | New external storage devices: CD-ROM; Interactive video; Plug-in memory cards                                                                                                                                                                                                                                                                                                                                   |
| 1990–1995 | Introduction of lap-top computers Major increase in storage memory devices and reduced costs (>1 Gbyte for £40) Spread of wireless computer technologies; wireless computer networks; air-mouse Development of video-conferencing.                                                                                                                                                                              |

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1996–1999  | Introduction of the electronic interactive whiteboard Introduction of PDAs Universal growth of the uses of the Internet in education                                                                                                                                                                                                                                                                                             |
| 2000–2004  | Expansion of mobile hand-held technologies: PDAs, mobile phones, and MP3 players Development of molecular computing technology Development of quantum computers Further increases in processing and storage of personal computers (5 G storage memory, >256 MHz processor)                                                                                                                                                       |
| 2005–2007  | Thin client technologies in schools and colleges Development of haptics devices for use in education. Development of molecular computing technology Further increases in processing and storage of personal computers and miniaturization (10 G storage memory, >256 k processor) Widespread access to wireless networks and interactive whiteboards Web2 technology – Social software environments: e.g. Wikipedia, Second Life |
| 2007–2011  | Graphics portable devices: iPhone; BlackBerry; iPad; Satnav; MP3 players; e-books Social software: Facebook, Blogs; Twitter; social bookmarking; One World TV. Integration of mobile technologies with social software                                                                                                                                                                                                           |
| 2011- 2018 | Cloud based learning, Massive Open Online Courses (MOOCS), Focus on Gamification, Improvements on HTML5 and JavaScript, Responsive web applications.                                                                                                                                                                                                                                                                             |

The progressive and tremendous use of those technological innovations has made a great impact on educational systems. Furthermore, a new model of technology-dependent learning has come to existence, this new model was opposed to the traditional learning model which assumes an instructor delivering learning content and answering questions in face-to-face synchronous sessions.

According to Oakes (2003), Computer-Based Training (CBT) era began mid 1990's, the beginning of this era was dominated by an instructor-led content repurposed into asynchronous, linearly designed courses delivered mainly on CD-ROMs. Later on, the introduction to internet and the ability to network information regardless of time and location have made a transformational impact on the way technology was used to present trainings (Rosenberg, 2003).

The late 1990's has witnessed the e-learning era. The word *e-learning* was defined several times in literature. Weggen and Urdan (2000) defined e-learning as "the delivery of content via all electronic media, including the Internet, intranets, extranets, satellite broadcast, audio/video tape, interactive TV and CD-ROM". However, Beamish et al. (2002, p. 105) defined e-learning as "a wide set of applications and processes allied to training and learning that includes computer-based learning, online learning, virtual classrooms and digital collaboration. These services can be delivered by a variety of electronic media, including the intranet, internet, interactive TV and satellite.". The definition of e-learning by Beamish et al (2002) will be adopted for this current study.

In the last two decades, the use of e-learning in organizations has been growing tremendously (Corry and Watkins, 2007; Hayashi et al, 2004), the use of e-learning in businesses has brought several advantages over the traditional (face to face) training methods. Mouzakitis (2009) discussed the advantages of using e-learning in training activities which included cost-effectiveness, productivity improvements, faster learning, better retention, customer satisfaction, employee increased satisfaction, and facilitation of self-paced learning.

In spite of e-learning advantages, some criticisms have been observed about its usage. Zhang et al. (2004) stated that lack of immediate feedback in asynchronous e-learning increased preparation time for instructors, being non-comfortable to some people, and more frustrating and sometimes may cause anxiety and confusion. Dringus (2000) mentioned that e-learning

users may be unable to sustain their learning momentum unless they have the skills for technology also being self-directed, self-motivated and prepared for isolation. Although those disadvantages were valid during the early days of e-learning implementation, the advancements in communication technologies and devices have reduced many of those disadvantages.

### **2.2.1 E-Learning Types**

E-learning has been categorized into two main types that are commonly presented; *synchronous and asynchronous* (Ariwa et al., 2011; Weng et al., 2011). Asynchronous learning is described as “a learning event in which people cannot communicate without time delay” (Urdan and Weggen, 2000). Asynchronous learning is mainly facilitated by the use of email, discussion boards, social networking, wikis, DVD, and does not necessarily require learner and teacher to be online simultaneously. This type of learning allows time and location flexibility. On the opposite, Synchronous Learning requires both learners and teachers to be online at the same time, thus adding time and location restrictions to the learning processes. Holmes (2000) described Synchronous Learning as “a real-time, instructor led online learning event, in which all participants are logged on at the same time and communicate directly with each other”.

The improvements on the computer and telecommunication technologies have allowed a “synchronous online learning” which assumes online interactions where participants are geographically separated. Researchers

have focused on the efficiency of synchronous online methods compared to traditional synchronous learning. Asterhan and Schwarz (2010) studied the online group discussions and concluded that the type of dialogue that the instructor facilitated and the degree to which learners were engaged in synchronous collaborative discussion affected learning outcomes. Same authors also found that the nature of discussion in asynchronous and synchronous online discussions was qualitatively different.

*Blended learning* is a more recent e-learning type which was introduced mid 2000. Several definitions were proposed for blended learning based on the question of “what was blended”. Graham (2006) states several definitions for blended learning:

- Combining online and face-to-face (f2f) instruction, based on the definitions provided by Reay (2001), Rooney (2003), Sands (2002), Ward & LaBranche (2003), and Young (2002).
- Combining instructional modalities, based on Bersin (2003), Orey (2002a), Singh and Reed (2001), Thomson (2002).
- Combining instructional methods, based on Driscoll (2002) and Rossett (2002).

Researchers have focused mainly on the first definition of Graham (2006). While the second and third definitions reflect the debate about using different instructional modalities vs using different instructional methods for transferring the knowledge, the first definition focuses on combining

both the technology and face to face means in communicating the knowledge. This definition looks more realistic to what the term “Blended learning” is used nowadays. In this definition, the technology role is considered to be centric comparing to the other two definitions.

The volume and quality of research in online and blended business education has increased dramatically during the past decade. Blended learning found a usage success in both educational and business setups. Corporates have been using blended learning more often in the last years. In a recent report published by Brandon Hall Group (2016) shows that 56% of interviewee companies have agreed on the efficiency of blended learning in improving individual performance. Also, there was an emphasis about using blended learning in improving organizational performance, increasing compliance rates as well as improving employees’ engagement as also described in the same report.

### **2.2.2 E-Learning in Business Context**

It is not new that globalization is shaping our economy these days. The increased competition has become one of the main drivers for organization’s training efforts. In order to improve their competencies and skill. Companies are investing generously in human capital needed to achieve their business goals. Several benefits have been mentioned in the literature on the reason why the use of e-learning became very popular among corporates. These include cost efficiency, increased productivity, faster learning with better retention, increasing customers and employees

overall satisfaction, better quality products (Mouzakitis, 2009). Prince and Kevin (2014) have examined the impact of corporate e-Learning on employees' productivity on overall job performance, organizational commitment and job satisfaction, their findings revealed that the use of technology alone is not enough for achieving required objectives, setting up learning strategy and management support are essential.

Newton and Donga (2007) claimed several justifications why e-learning has been popular among corporates including: efficiency and productivity of employees, ease of implementation, time-flexible savings, and cost savings. Other benefits of e-learning are the ability to deliver the training material in geographically distributed locations, anytime, and to anyone; just-in-time training; personalized training leading to higher content retention by learners; better monitoring system on employees' performance and progress; effective delivery compliance training; higher collaboration and interactivity; and customized and personalized training options.

### **2.2.3 E-learning implementation challenges**

The implementation of e-learning has never been a trivial task. Several difficulties that faced

corporates in their journeys to implement e-learning were obvious. One important difficulty was the lack of understanding of the multifaceted nature of e-learning (Zhongke, 2012). In the early period of companies engaging in e-learning implementation, many companies were vulnerable to plethora of sellers of e-learning services; Sellers promised with quick

systems at low costs, which enticed the corporates and led to many failures. Big damage to e-learning had happened, in terms of e-learning perception and generated a negative feelings towards e-learning for new comers (Bennink, 2004).

Generally speaking, it is clear that difficulties accompanied the implementation of e-learning in corporations have varied over the past two decades. The rapid advancements in telecommunications and personal computing technologies have changed the nature of the problems that appeared during the early period of adoption, As an example of such change is the costs of installing and managing a server-based system was beyond the reach of most Small to Medium Enterprises (SMEs) (Brown et al.,2006), where today, the cost of setting up a server-based Learning Management System (LMS) such as moodle, Forma LMS , Open OLAT has dropped significantly and became significantly affordable.

Bennink (2004) spotted the key drivers, success factors, barriers, and models for the Australian corporates wanting to engage in e-learning. His findings highlighted that there was no clear “one” e-learning model that fits all, handling organization actual needs is the key to success. Sloman and Van Buren, (2003) stated that in the early period of e-learning adoption, the corporates focused on the technology as a mean for delivering the learning content. There was less understanding about the importance of the human element that is needed to design an effective learning content Introducing the most advanced learning platform and tools alone would not necessarily produce the best learning results (Zhongke, 2012; Ellis and Kuznia, 2014).

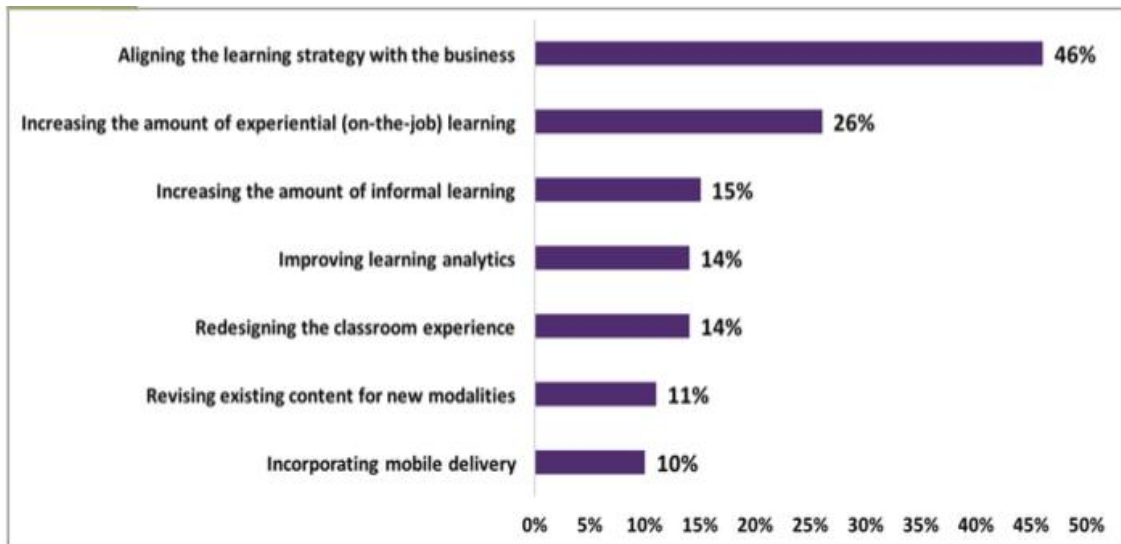
Ignoring the pedagogy and the human factor in learning content development, support, as well as the employee knowledge and background variations would have big influence on the implementation success equation (Govindasamy, 2001; Nichols and Anderson, 2005). Focusing on learner has improved the learning quality and brought e-learning higher to meet better the expectations (Xini and Petropoulos, 2004).

Masie (2001) highlighted “Learner Acceptance” show that e-learning acceptance in corporates is not guaranteed and it requires firms to address issues of marketing (to encourage e-learning engagement), support (to aid retention), incentives and technology (to support collaboration and provide blended solutions)

Paulsen (2009) studied the use of e-learning in SMEs. His findings suggested that SMEs could use e-learning successfully based on three different categories of courses: generic courses, sector courses, and internal courses. The author also found that a deficient information policy regarding e-learning for SMEs and the challenge of overcoming resistance to e-learning among employees was a major obstacle. Lack of learning content in national language was also marked as an obstacle by a good number of organizations subject to his study. Another issue that Paulsen (2009) highlighted is the lack of human interactions within the e-learning system, these findings were aligned with Zhongke (2012) who explored the e-learning applications improvement tactics in corporates. He stated that there are *three* factor groups affecting the success of e-learning implementation in corporates. These are *organizational* factors such as

organization scale, support and culture, *employee related* factors such as motivation for self-achievement, self-efficacy, confidence and creativity, and finally the *technique-related* factors such as content design attractiveness and quality, communication, network and learning system capability.

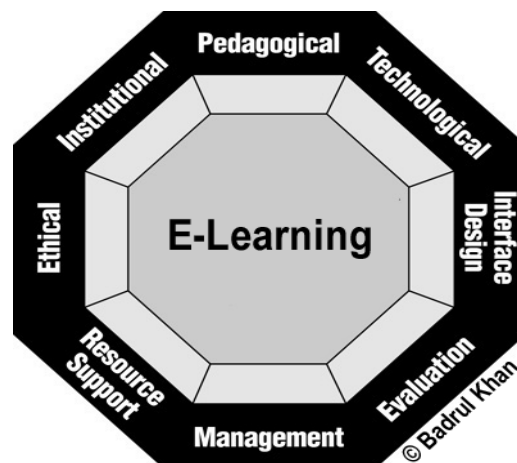
Aligning the learning strategy with business strategies is becoming a big challenge for human resources departments. Brandon Hall Group (2016) highlighted the most critical learning initiatives for achieving business goals. Figure 2.1 shows the most critical learning initiatives for achieving business goals nowadays. The report stated that the organizations continue to struggle with developing a solid learning and development strategy that has a big impact of their business. The report also described that companies are finally embracing the need for new ideas and technologies to support learning. Also, most companies have learning strategies but there is still much room for improvement; linking between learning strategy and business as mean of finding a more efficient way to evaluate the efficiency of trainings was one of important answers that were described in the same report.



**Figure 2.1:** Most Critical Learning Initiatives for Achieving Business Goals, Source: Brendan Hall Group (2016).

#### 2.2.4 E-learning Dimensions

Khan (2001) had published an e-learning framework in response to readers about web-based instructions. The model defined eight dimensions for e-learning (i.e. pedagogical, technology, interface design, evaluation, management, resource support, ethical, and institutional) as shown in Figure 2.2.



**Figure 2.2:** The Web Based Learning (WBL) Framework, Source: Khan (2001)

in an effort to evaluate e-learning, Varlamis and Apostolakis (2011) have proposed four main dimensions (Pedagogical, Technical, Social, Organizational).

#### **2.2.4.1 Pedagogical Dimension**

The pedagogical dimension of e-learning addresses the topics related to content design, development and delivery. E-learning by itself is another way of teaching and learning (Govindasamy, 2001). Technology plays a very important role on how the learning material is presented. In the first period of the e-learning implementation, there was less care about pedagogy as a critical element for e-learning success. Firdiyeyek (1999) argued that there is a big gap between the abundance of features in Learning Management Systems (LMS) and the lack of explanation on the pedagogy underlying the inclusion of the presented tools. When e-Learning is concerned, the practice of teaching or instruction is well represented in a linking science known as Instructional Technology (Govindasamy, 2001).

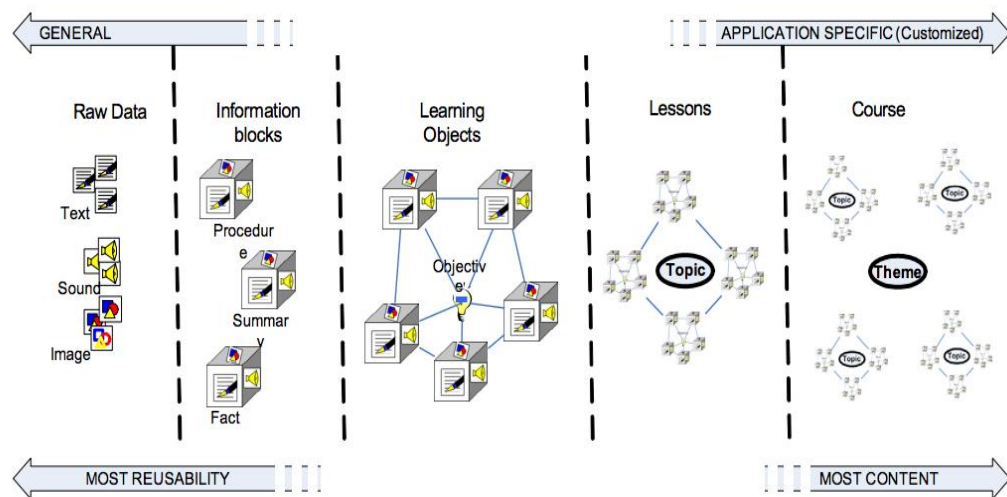
Govindasamy (2001) discussed four main attributes related to e-learning pedagogy, developing content, storing and managing content, packaging content, student support, and assessment. The core content elements of e-Learning system are the “learning objects” (LOs) (Wiley, 2002). Govindasamy (2001) stated that e-Learning content needs to be designed and developed in smaller manageable information pieces known as learning objects. The term was "first popularized by Wayne Hodgins in

1994 when he named the CedMA [sic; Computer Education Management Association] working group 'Learning Architectures, APIs and Learning Objects' (Polsani 2003). There is no clear definition of learning objects online. Barritt et al.(1999) defined **learning object (LO)** as "a collection of content items, practice items, and assessment items that are combined based on a single learning objective". L'Allier (1997) also defined Learning Object as “the smallest independent structural experience that contains an objective, a learning activity and an assessment.”

Discoverability, reusability and interoperability are three important aspects of a learning object. In order to support discoverability, learning objects need to have a standard description. The Learning Object Metadata (LOM) is a very important model adopted by IEEE (2007). Typically for the reusability purpose (being able to reuse the learning object in different contexts), some researchers visualized learning objects as Lego blocks. Wiley (2001) stated that using the Lego blocks to describe LO is too simplistic and should be avoided.

Varlamis and Apostolakis (2006) had used the term “content object” describing a concept that is very similar to LO. They provided insight for global standardization and steps were illustrated for the successful configuration and deployment of a globally accepted standard. An LO model was explored as one element of the e-learning process standardization.

The model representing learning objects is shown in Figure 2.3. It shows a hierarchal structure for representing the content, starting from raw data to form information blocks. Attaching objective to information blocks would lead to form the learning object, which can be then used as a building block for lessons and courses.



**Figure 2.3:** Hierarchy and structure of content object . Varlamis & Apostolakis (2006)

The conceptual model of the learning object has several characteristics as stated by Varlamis and Apostolakis (2006). These characteristics include modularity (as component-based approach), the hierarchal nature of its structure, the possession of meta data on each level, which requires a technical infrastructure for development, assembling and managing reusable granular content objects taking in consideration that meta data are written independent of delivery media and accessed dynamically through a database.

Through their advanced distributed learning program (ADL), the U.S. military has created the Sharable Content Object Reference Model (SCORM). This standard was mainly needed in order to enable cost effective sharing of the content material among different learning management systems (LMSs). The use of SCORM concept got several upgrades over the past fifteen years, beginning with SCORM 1.1 in 2000 and ending with the experience API (xAPI) – a new name for the SCORM- the standard kept evolving by adding more and more features to improve the sharing and interaction of the learning content with the host (LMSs).

In spite of all research and common findings on LOs, and by reviewing the standards of LO metadata and SCORM, it is clear that the concept was mainly focused on pure pedagogy in the educational organizations. Less care was given on sharing these learning objects with respect to context, also, even though this standard was growing tremendously among educational communities, less care was given to the features required to improve its usage in vocational and organizational trainings.

#### **2.2.4.2 Technological Dimension**

E-Learning technological dimension addresses topics related to software, hardware, and infrastructure aspects of e-learning (Khan, 2003). Developing informatics and technological devices have progressed rapidly in education field in the past three decades (Reyes et al., 2009). Graf and List (2005) have made a study on open source LMS to compare their features, the study included several categories for comparison including

communication tools, learning objects, management of user data, usability, adaptation, technical aspects, administration and course management. Several open-source LMS were compared and moodle LMS had the highest ranking in most of the compared categories.

Chaudhary and Saxena (2015) presented the benefits of using cloud computing for e-learning. Authors asserted that using cloud computing allowed researchers to effectively find models and make discoveries faster than ever. The widespread of smart mobile devices has introduced a new distance learning type, mobile learning or “m-learning”. Agah and Ayse (2011) have discussed mobile learning as a new learning trend in both higher education and business. The fact that mobile devices are small enough to carry anywhere have made them an interesting subject of study in the context of distance learning (Agah & Ayse, 2011). Researchers differentiated e-learning and m-learning in some terminologies used in the context of both types. Table 2.2 shows list of terms used in e-learning and their corresponding usage in m-learning (Eteokleous and Laouris, 2005).

**Table 2.2: Terminology comparison between e- and m-learning (Eteokleous & Y.Laouris, 2005).**

| e-learning          | m-learning                                  |
|---------------------|---------------------------------------------|
| Computer            | Mobile                                      |
| Bandwidth           | GPRS, G3, Bluetooth                         |
| Multimedia          | Objects                                     |
| Interactive         | Spontaneous                                 |
| Hyperlinked         | Connected                                   |
| Collaborative       | Networked                                   |
| Media-rich          | Lightweight                                 |
| Distance learning   | Situated learning                           |
| More formal         | Informal                                    |
| Simulated situation | Realistic situation                         |
| Hyperlearning       | Constructivism, situationism, collaborative |

#### **2.2.4.3 Evaluation Dimension**

ASTD (2000a) mentioned that evaluating e-learning can be done using the same techniques used to evaluate other training solutions. Kirkpatrick (1979) had presented a classic model for evaluating training (traditional and e-learning). This model stated four levels to be evaluated; Level I: Reaction (i.e. the reaction of learners to the course), Level II: Learning (i.e. measuring what learners have learned), Level III: Transfer (i.e. measuring the behavior change after returning to job after the training program), Level IV: Results (i.e. the direct reflection of the job outcomes as a result of the given training). Phillips (1996) recommended adding Return on Investment (ROI) as a fifth level in addition to the four levels mentioned. Bartel (2000) investigated the ROI as a way to measure training efficiency. Data of several organizations in UK and US were studied, it was concluded that training impact on ROI is higher than previous expectations. Also, it has been emphasized that researchers should have more access to companies' databases in order to reveal more information and variables about the effect of training on ROI.

#### **2.2.4.4 Management Dimension**

Management is another important dimension of e-learning implementation processes, setting up an e-learning strategy and strategic plans are crucial for e-learning implementation. LMS plays a very important role in managing the learning environment.

Macpherson et al. (2004) mentioned top management's consistency and vocal support as a key to success of implementing e-learning. Similarly, Masie (2001) emphasized on the role of manager as a champion for extending the e-learning offerings.

Top management should integrate a maintenance and support plan which usually consumes a great deal of resources (time and budget) during the e-learning strategy implementation. However, failing to recognize the importance of maintenance and support will highly sabotage all the efforts done reconsidering other dimensions and would lead to doomed failures (Moore 2007).

### **2.2.5 E-Learning and Knowledge Management**

There is a growing interest in the relationship between e-learning and knowledge management, (Swanson, 2001). In recent years, both e-learning and knowledge management (KM) have been evolving. KM deals with the best way to leverage knowledge internally and externally in order to preserve the institutional knowledge base and promote organization effectiveness (Liebowitz and Frank, 2011). Similarly, e-learning has been around for years as a training tool for both educational institutes and businesses. As those two fields develop, synergistic relationships continue to develop between both (Efimova and Swaak, 2002). For example, both fields deal with knowledge capture, application, and sharing of information (Ras et al., 2005; Chawhan, 2012). Also, both have components that contribute to the overall organization learning culture (Liebowitz and

Frank, 2011). Wild et al. (2002) and Chunhua (2008) discussed e-learning as a new approach to KM. In their work, e-learning was seen as a tool for knowledge sharing and acquiring in the organization learning context. Lamont (2003) had investigated the relation of both KM and e-learning from strategic point of view. It was observed that e-learning alone has not reflected a strategic, corporate-wide vision, but has more of a tactical and departmental focus. KM, on the other hand, reflects a more strategic view of the organization.

LO is considered to be one important intersection where both KM and E-Learning areas meet (Efimova and Swaak, 2002). Lamont (2003) stated that reusable LOs allow learning content to be divided into smaller units that can be used by learning management systems (LMS) in the processes of course development. Moreover, he mentioned that e-learning by itself is mainly delivering a static content, and any integration between KM and e-learning will bring a dynamic yet better learning experience that is closer to the job.

Del Peso and De Arriaga (2008) discussed automatic construction of ontologies as a mean to create intelligent e-learning systems. This increases interoperability and communication among knowledge bases through the automatic updating the knowledge bases used in intelligent e-learning systems.

Lau and Tsui (2009) have discussed how the integration of KM within an e-learning environment can provide a learning grid that enables the learner

to identify the correct learning objects associated with the learner's context, needs, and preferences. Shaw (2009) stated that tools such as knowledge maps, could improve one's e-learning performance. Lee (2009) had studied the acceptance of e-learning in South Korea. It was concluded that the implementation of educational model, instructor characteristics, teaching materials, ease of use, formed very important factors for a successful e-learning implementation.

### **2.2.6 The e-Learning Maturity Model (eMM)**

Marshal (2010) proposed an e-learning model (eMM) that helps institutions to assess their institution e-learning maturity. The model is mainly based on the Capability and Maturity model (CMM) published by the Software Engineering Institute (SIE, 1993). The eMM has inherited the CMM original five Levels / Dimensions. (Delivery, Planning, Definition, Management and Optimization).

The *Delivery* dimension is concerned with the creation and provision of the processes output; it also helps answering the question: "To what extent the process is seen to operate within the institution?", The *Planning* dimension covers the assessment of using predefined objectives and plans in conducting the work of the process, this would help improving the ability of managing the process in most effective manner. The *Definition* dimension takes care of insuring that institutions have the defined standards, templates, policies and guidelines required during the implementation. Finally, the *Management* dimension covers how the

institution is managing the implementation and quality control of the process (Marshall, 2010; SIE 1993).

### **2.3 Competency-Based Approaches**

Draganidis and Mentzas (2006) have defined the Competency as *a combination of tacit and explicit knowledge, behavior and skills that gives someone the potential for effectiveness in task performance*. Commission of the European Communities (2005) defines competence as “a combination of knowledge, skills and attitudes appropriate to a particular situation”. Competency models serve as the link between the organization strategy and human resources strategic planning (Kaushiki & Manisha, 2014; George et al., 2007). Competency models allow organizations to assess their human resources based on their skills and knowledge. It is considered a very important tool for modern human resources planning.

Referring to the literature, it is clear that several generations of the competency based approaches were evolving over the past century. Brown (1994) had traced down a sequential progress of the competency based model and stated that the model presented in 1980 and early 1990's represented the fourth and fifth generations. Brown's historical record stated that the first generation was largely informed by the Australian' competency based vocational education model – the application of scientific management to the work roles. The second generation of the competency based approaches was the development of mastery learning in US during the 1920s and 1930s. The third generation was concerned with

the formative vocational education. The fourth generation appeared with more emphasis on the word “competency” in US where they moved behind the vocational learning to education.

Collins (2013) have investigated the advancement of the new technologies and widespread of online learning technologies that helped in the arrival of the sixth generation of the Competency Based Learning (CBL). The current direction taken in the implanting of CBL is taking three main forms as Collins (2013) observed. The *first* is embedding competency-based assessments into a traditional curriculum. The *second* is redesigning the curriculum entirely around competencies. The third is redesigning the credentialing process around competency-based assessments, also known as direct assessment.

Corporates have been using competency models for assessment, training and development since its introduction by David McClelland (1973). McClelland had made an argument that academic measures as well as intelligence tests did not predict job performance and should be replaced by a measure of competence, since then the competencies concept had been received very well and gained big popularity in the business world. Boyatzis (1982), has defined a competency as an “underlying characteristic of a person which results in effective and/or superior performance in a job”. Boyatzis suggested that there is a finite number of competencies that are related to the success of specific job.

### **2.3.1 Competency based approaches popularity and criticism**

In the last few years, the competency-based approaches have received an increasing attention from business organizations (Tripathi & Agrawal, 2014). Despite the long history of the competency based training and education, its usage has been growing steadily (Ennis, 2008).

One reason why competencies are popular among corporates is that they tend to be connected to the goals and strategies of the organization (George et al., 2007). Pearlman (1977) compared job analysis and competencies; He found that job analysis was superior to competencies in methods, descriptors, reliability, content revision, and documentation; although it was not better, in linkage to business strategies and goals.

A second reason contributing to the competencies popularity is that job analysis are objective description of the job itself, competencies are closer to the day-to-day language of how employees describe their jobs (George et al., 2007).

Lundqvist et al. (2011) listed some of the benefits of using competency frameworks in organizations, including: defining different sectors in the work force, allowing users to view regional (i.e. international and national) issues, different domains of target users (i.e. corporate world, education, HR, government, etc.), accommodating different purposes (e.g. enable easy transition between educational institutes, or between “world of education” to “world of work”).

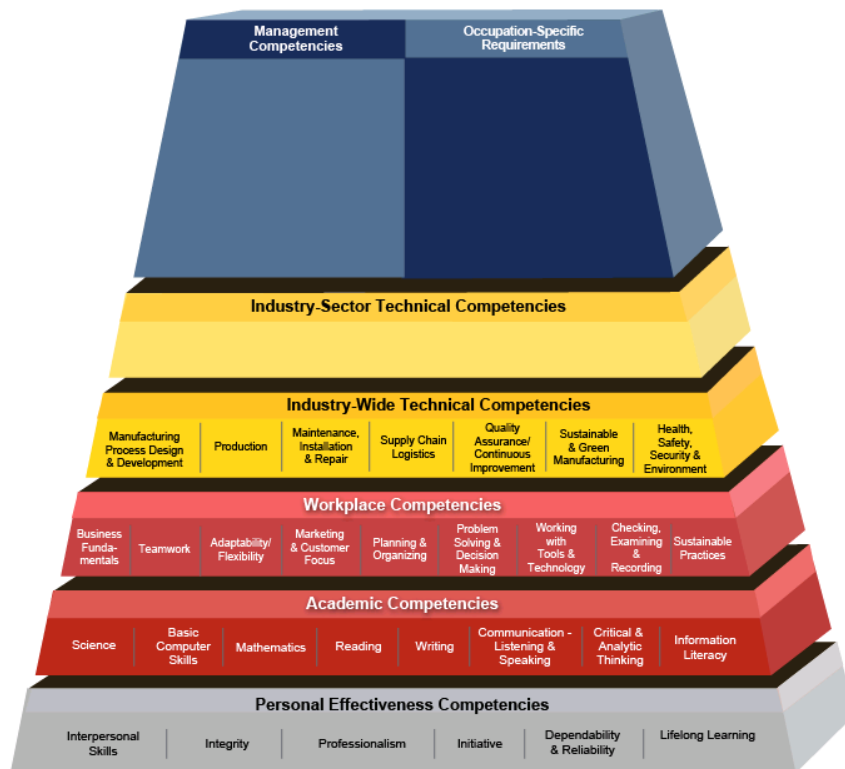
It should be mentioned that not all authors attributed the beginning of the popularity of competencies to Boyatzis. Brannick and Levine (2002), for example, it was suggested that it was the work of Prahalad and Hamel (1990) that was pivotal in this context.

Despite its popularity, researchers had criticized competencies in the past for being amorphous in some cases (Harvey, 1999), being very broad, or a failure to include job analysis information in their development (Lievens et al., 2004). In fact, reviewing the most recent versions of competencies has been resolved by proposing several standards for the competency structure, attaching competency description and other dimensions have helped overcoming ambiguity issues related to competencies.

### **2.3.2 Competencies in the Macro scale / Nationwide level**

Reviewing the previous works about competency models, it is clear that the use of competency models is not only popular among modern organizations. In fact, governments in many countries are trying to nationalize competencies as a mean to bring a standard to their industry requirements. Starting from recent use of competencies, in 2010, the U.S. Department of Labor's Employment and Training Administration (ETA) (2010) announced the release of a competency model for the commercial, industrial, and construction sectors, the project contained a set of tools where organizations can build their own competency models based on a set of standard competency libraries that simplified the models construction.

Figure 2.4 shows an example of the Advanced Manufacturing Competency Model proposed by ETA. The competency framework presented by the ETA (2010) has mainly seven competency categories/tiers: Personal effectiveness competencies, Academic competencies, Workplace competencies, Industrywide technical competencies, Industry sectors technical competencies, Management competencies and finally occupational specific requirements.



**Figure 2.4:** Advanced Manufacturing Competency Model proposed by ETA, Source: (ETA, 2010)

The competency models presented by the (ETA) share the same competency categories/tiers structure, though each industry has its own competency groups that fits within different tiers.

The lower three tiers describe the foundational knowledge required; as one goes up in tiers, the competencies become more industry specific. The proposed models form a basis for setting a common industry skill sets, setting up a skill standard as well as to identify specific employer skill needs and certifications.

Similarly, in 2013, the European Commission has also published the third version of its e-Competence Framework for ICT Professionals in all industry sectors. This version followed two previous versions in 2007 and 2010, and had mainly four different dimensions describing the structure of its competencies. *Dimension 1* reflects five e-competence areas, derived from ICT business processes: Plan, Build, Run, Enable and Manage. *Dimension 2* defines a set of e-competences for each area, with reference definitions for 40 different competences in total. *Dimension 3* sets out proficiency levels (e-1 to e-5) of each e-competence, which correspond to levels 3 to 8 in the European Qualification Framework (EQF). *Dimension 4* provides examples of knowledge and skills that relate to the specific e-competences defined in dimension 2. Figure 5 shows the entry point for the e-Competence Framework 3.0 developed by the European Commission (CEPIS, 2016)

| Dimension 1                  | Dimension 2                                    | Dimension 3                                                            |     |     |     |     |
|------------------------------|------------------------------------------------|------------------------------------------------------------------------|-----|-----|-----|-----|
| 5 e-competence areas (A - E) | 40 e-competences identified                    | e-competence proficiency levels e-1 to e-5 (related to EQF levels 3-8) |     |     |     |     |
|                              |                                                | e-CF levels identified for each competence                             |     |     |     |     |
|                              |                                                | e-1                                                                    | e-2 | e-3 | e-4 | e-5 |
| A. PLAN                      | A.1. IS and Business Strategy Alignment        |                                                                        |     |     |     |     |
|                              | A.2. Service Level Management                  |                                                                        |     |     |     |     |
|                              | A.3. Business Plan Development                 |                                                                        |     |     |     |     |
|                              | A.4. Product/ Service Planning                 |                                                                        |     |     |     |     |
|                              | A.5. Architecture Design                       |                                                                        |     |     |     |     |
|                              | A.6. Application Design                        |                                                                        |     |     |     |     |
|                              | A.7. Technology Trend Monitoring               |                                                                        |     |     |     |     |
|                              | A.8. Sustainable Development                   |                                                                        |     |     |     |     |
|                              | A.9. Innovating                                |                                                                        |     |     |     |     |
| B. BUILD                     | B.1. Application Development                   |                                                                        |     |     |     |     |
|                              | B.2. Component Integration                     |                                                                        |     |     |     |     |
|                              | B.3. Testing                                   |                                                                        |     |     |     |     |
|                              | B.4. Solution Deployment                       |                                                                        |     |     |     |     |
|                              | B.5. Documentation Production                  |                                                                        |     |     |     |     |
|                              | B.6. Systems Engineering                       |                                                                        |     |     |     |     |
| C. RUN                       | C.1. User Support                              |                                                                        |     |     |     |     |
|                              | C.2. Change Support                            |                                                                        |     |     |     |     |
|                              | C.3. Service Delivery                          |                                                                        |     |     |     |     |
|                              | C.4. Problem Management                        |                                                                        |     |     |     |     |
| D. ENABLE                    | D.1. Information Security Strategy Development |                                                                        |     |     |     |     |
|                              | D.2. ICT Quality Strategy Development          |                                                                        |     |     |     |     |
|                              | D.3. Education and Training Provision          |                                                                        |     |     |     |     |
|                              | D.4. Purchasing                                |                                                                        |     |     |     |     |
|                              | D.5. Sales Proposal Development                |                                                                        |     |     |     |     |
|                              | D.6. Channel Management                        |                                                                        |     |     |     |     |
|                              | D.7. Sales Management                          |                                                                        |     |     |     |     |
|                              | D.8. Contract Management                       |                                                                        |     |     |     |     |
|                              | D.9. Personnel Development                     |                                                                        |     |     |     |     |
|                              | D.10. Information and Knowledge Management     |                                                                        |     |     |     |     |
|                              | D.11. Needs Identification                     |                                                                        |     |     |     |     |
|                              | D.12. Digital Marketing                        |                                                                        |     |     |     |     |
| E. MANAGE                    | E.1. Forecast Development                      |                                                                        |     |     |     |     |
|                              | E.2. Project and Portfolio Management          |                                                                        |     |     |     |     |
|                              | E.3. Risk Management                           |                                                                        |     |     |     |     |
|                              | E.4. Relationship Management                   |                                                                        |     |     |     |     |
|                              | E.5. Process Improvement                       |                                                                        |     |     |     |     |
|                              | E.6. ICT Quality Management                    |                                                                        |     |     |     |     |
|                              | E.7. Business Change Management                |                                                                        |     |     |     |     |
|                              | E.8. Information Security Management           |                                                                        |     |     |     |     |
|                              | E.9. IS Governance                             |                                                                        |     |     |     |     |

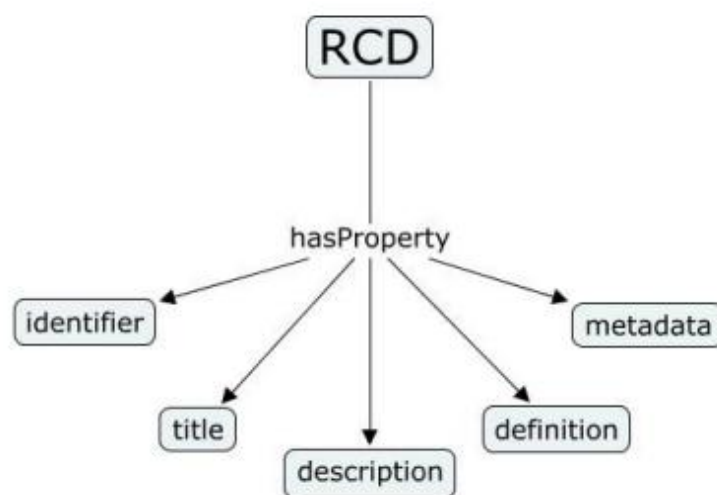
**Figure 2.5:** e-Competence Framework 3.0 developed by the European Commission, Source: European e-Competence Framework, 2013

### 2.3.3 E-learning Competency Based Initiatives

In the recent years, attempts to integrate competency-based learning models with e-learning have been growing tremendously. The fact that competencies have strong strategic properties had made many corporates explore the topic closely.

Ostyn (2005) had published a white paper about the automation of competency tracking and management in the context of performance support and training. He proposed a framework that used standard formats to simplify the process of collecting and adapting individual and group competencies, the proposed framework did not rely on automated system completely, instead the author proposed that human common sense, policies with full understanding of the surrounding organization environment should be also employed to get most efficient results.

Building on the work of Ostyn, the concept of reusable competency definition (RCD) was born. The idea behind the reusable competency definition is that a competency has a definition (usually a generic one) that is may be reused for different individuals in one or several contexts (Ostyn, 2005)



**Figure 2.6:** RCD structure. Source: IEEE (2007)

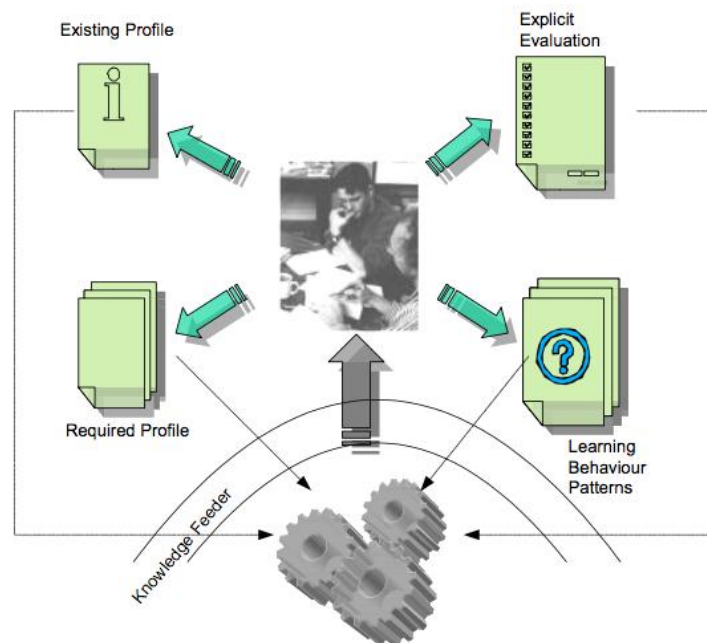
This concept was adopted by the (LTSC, 2007). The RCD standard shown in Figure 2.6 has five main properties: identifier, title, description, definition and metadata. There had been some criticism for the RCD model that it does not hold other competency-related information such as context, evidence or dimension (Lundqvist et al., 2011).

Practitioners categorized competencies in order to reduce management complexity and bring some sort of standard as well as making the study and managing the frameworks easier. Kaur and Kumar (2013) have categorized competencies into three main categories, technical, managerial and human attributes. Ostyn (2005) has proposed the Reusable Competency Mapping concept (RCM) which was defined as “a competency map that represents a particular way to define a structured competency model, that uses a collection of RCDs”.

The integration between e-learning and CBL had gained more attention recently, researchers went after investigating other aspects of this integration. Cheng et al. (2011) discussed the acceptance of competency-based workplace e-learning system, more specifically they explored the learners perception and reactions towards CBL in business environment; A conceptual model was proposed to examine the perceived individual and social learning support on employees' acceptance of competency-based e-learning systems. The results have shown the positive effects of perceived individual learning support and perceived support for promoting a norm of cooperation on employees' intention to use the competency-based e-learning system, Also, it was noted that there was a negative effect on

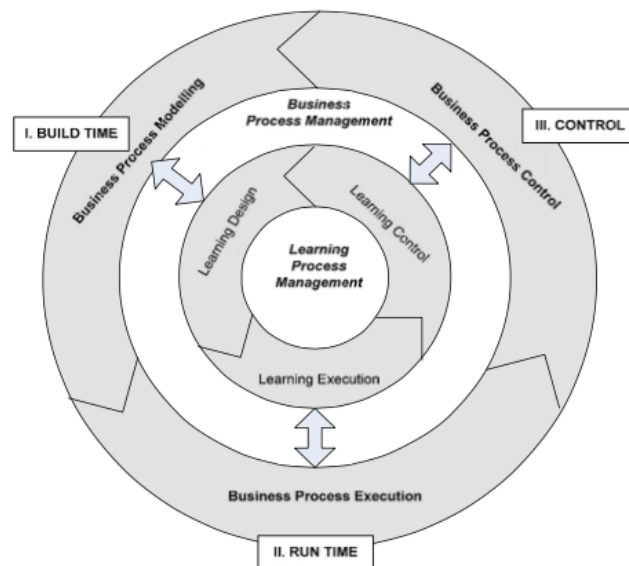
employees' behavioral intention caused by the perceived support for enhancing social ties. The gender, age, and prior experience differences had been also subject to their study.

Xini and Petropoulos (2004) explored the design of competency based e-Learning initiatives. They investigated the issues accompanying the process. They also proposed theoretical tools for supporting and tracking personal competencies facilitating the capture of individual, informal knowledge and evaluation. They proposed a dynamic method for suggesting learning paths and programs, the study presented a learner centric approach that is composed of four main blocks, these blocks were used in the evaluation processes: learner profile, required profile, explicate evaluation and learning behavior patterns, as described in Figure 2.7.



**Figure 2.7:** Conceptual model of Xini and Petropoulos (2004)

Leyking et al. (2007) have explored the competency and process-driven e-learning. They suggested that business processes to form the context for competency driven learning. Business processes performance is tightly coupled with knowledge and competencies of the employee involved. It was mentioned that the output of the business processes should form the feedback of the knowledge and competencies required. A processes-driven learning lifecycle was proposed to integrate both business processes with learning processes.



**Figure 2.8:** Integrated business and learning process lifecycles. Source: Leyking et al. (2007)

George et al. (2007) presented the work of The United States Air Force Research Laboratory (AFRL) flight training program. The program focused on the rational integration of networked flying, flying-related, and command and control simulators into current training via distributed mission operations (DMO). A new concept was developed, the Mission Essential Competencies (MEC). The MECs were used to determine the

training requirements as well as allowing the mix of live operation and virtual trainings required.

MEC by itself is a brief statement, with clarifying text as appropriate. It also has a stipulated start, end, and purpose statement.

**Table 2.3: MEC Example to multi-roles. Source: George et al. (2007)**

| <i>MEC</i>                                               | AST | ST | ASO | DST | EPT | WD | SD | MCC | ICT | BC | BSC | OC |
|----------------------------------------------------------|-----|----|-----|-----|-----|----|----|-----|-----|----|-----|----|
| 5. Establishes, maintains and adjusts radar picture      | P   | S  | P   | S   | P   |    | S  | S   |     |    |     |    |
| 6. Detects entities in Area of Interest                  | P   | P  | P   |     | P   | S  | S  | S   |     |    |     |    |
| 7. Identifies entities in Area of Interest per ID matrix | P   | P  | P   |     | S   | S  | S  | S   |     |    |     |    |
| 8. Updates/tracks entities in Area of Interest           | P   | P  | P   |     | P   | S  | S  | S   |     |    |     |    |
| 9. Conducts decentralized command and control            | S   | S  | S   |     |     | P  | P  | P   |     | P  | S   | S  |

**Note:** P = Primary duty  
S = Secondary duty  
Blank = Not applicable

AST = Air Surveillance Technician  
ST = Surveillance Technician  
ASO = Air Surveillance Officer  
DST = Data Systems Technician  
ICT = Interface Control Technician  
BSC = Battle Staff Coordinator

EPT = Electronic Protection Technician  
WD = Weapons Director  
SD = Senior Director  
MCC = Mission Crew Commander  
BC = Battle Commander  
OC = Operations Coordinator

Table 2.3 shows an example of assigning different MECs to different roles. The boxes with letters P, S and blank boxes are used to describe the priority/applicability of the MEC to specific role.

Supporting competencies (SC) described the lower level competencies that supports the MECs. An example of supporting competency would be “*Multi-Tasking*” or “*Internal Team Work*“. Knowledge and skills were also at a lower level of analysis of MEC’s or SC which formed an important part of the system and were elicited at the level of natural language.

### **2.3.4 People Capability Maturity Model**

The people capability and maturity model is a quality framework which was developed by Curtis et al. (2009). The framework focuses on improving the human talent in the organization and assess its maturity. Its build on ideas from the famous capability and maturity model CMM. Its comprised of twenty-two practice groups managing different aspects of the modern organization human resource departments. Several practice groups focus on building both the individual workgroup competencies. The framework has been used by several organizations worldwide and considered an important reference for practical human resources management.

## **2.4 Summary**

In this chapter, a literature review was conducted about two major topics related to this study: e-learning and competency based approaches. The first section of this chapter presented several e-learning related topics. The chapter explored difficulties that corporates faced through their implementation journeys. Different e-learning dimensions and theories were reviewed. Also, e-learning models related to content and evaluation were explored. The second section of this chapter explored the Competency based approaches. Literature about its origins and usage in multiple scales were explored. Different models that combine learning and CPL were also presented.

## **Chapter 3**

### **Research Methodology**

#### **3.1 Overview**

In the previous chapter, the literature of e-learning and competency based learning was reviewed. As mentioned in Chapter 1 the aim of this research is to explore the difficulties that modern organizations face while implementing e-learning in a competency based setup (CBeL). This chapter describes the research methodology, research design, data collection, and data analysis techniques used. Generalizability and collected data validation techniques is also discussed.

#### **3.2 Research Methodology**

Our focus in this chapter turns to find the most appropriate research methodology that answers the research questions. A case study with a *mixed methodology* was followed in this research.

Generally, research methodologies are classified into three main categories: Qualitative, Quantitative and Mixed methods research. A quantitative research enforces top-down approach, the theory is first identified then it is followed by hypothesis generation, data is then collected and analyzed to falsify or support the hypothesis. This approach is known to be deductive. In contrast to the quantitative approach, the Qualitative approach tends to be a bottom-up approach and is more described to be inductive (Creswell & Plano Clark, 2007). In the quantitative approach, rich data is first collected and analyzed then used to engender new potential theories. The mixed

methods combines both the qualitative and quantitative techniques. The mixed research methodology allows a better understanding of research problems and helps the researcher to think outside the box (Brannen, 2008).

There are several reasons for choosing mixed methods approach. First, the contextual aspect of the research which cannot be captured easily using the quantitative approach alone. Ignoring the contexts would lead to incomplete and less accurate conclusions. The mixed methodology allows a better understanding of the case problem, it also helps seeking convergence among both qualitative and quantitative data sources which highly increases the study validity and reliability (Jick, 1979).

However, some critics of the mixed methods approach tend to dismiss it as a methodological fad. For instance, Bergman (2008) points out that quantitative researchers feel that they must always include an element of qualitative research into their design to improve the marketability of their studies. Bryman (2008) also builds on this point, and claims that the use of mixed methods is “often insufficiently justified” (p. 87). In order to avoid such criticisms in relation to this study, a rationale supporting the use of mixed methods are provided below.

There are several rationales described by researchers that justify the use of mixed methodology designs within a single case study. Bryman (2008) suggested 16 possible justifications for using a mixed methodology design: completeness, process, different research questions, explanation,

unexpected results, triangulation, instrument illustration, utility, confirm and discover, diversity of views, enhancement, development, offset, sampling, credibility and context. (Bryman, 2008). In this thesis, the rationale behind the implementation of case study with a mixed methodology is justified by three rationales: instrument development, context, and triangulation. The *first* rationale is the use of mixed methodology design in order to develop an instrument that assists in qualitative data collection. Bryman (2006) suggested that a mixed methodology can be used in developing an instrument and scaled items in order for some comprehensive closed answers to be generated. Myers and Oetzel's (2003) used mixed methodology to study organizational assimilation, they explored the subject quantitatively first; the themes emerged from their quantitative data were then used to develop an instrument that was used to collect data in a later phase of their study.

The *second* rationale behind using a mixed methodology design is the complex context of the research area which required a detailed understanding of the several aspects of the research surroundings. Mixed methodology can be used when the broad relationships among variables are uncovered through an ordinary survey (Bryman, 2008). The *third* rationale for using a mixed methodology case study design is the triangulation. Using multiple methods for data collection and analysis will help increasing the research validity and reliability (Patton, 2002).

### 3.3 Research Design and Strategy

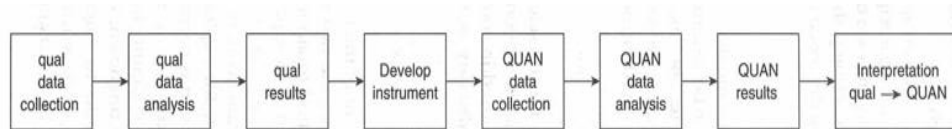
In this research, an exploratory holistic single case study has been followed. Yin (2009) has introduced four case study design types: 1) Single case (Holistic), 2) Single case (embedded) 3) Multiple case (holistic) 4) Multiple case (Embedded). Each of the four design types are suitable for investigating contextual conditions related to the case. On the other hand, the four design types differ in the number of cases studied and also the relations between these cases.

In general, case studies are known to be efficient when the research requires a “close examination of people, topics, issues, or programs”, (Hays, 2004). Yin (1994) has mentioned that case studies are best suited in the situations where the “*Boundaries between phenomenon and context are not clearly evident*”.

Yin (2009) stated four rationales for using single case design based on the case or the phenomena subject to the study: critical case, extreme or unique case, representative (typical case), revelatory, longitudinal cases. (refer to Yin (2009)). In this research, the rationale behind the selection of a single case study refers to Yin’s first rational; *The extreme and unique case of the case*. The “case” of this study is considered extreme in terms of maturity, organization size, complexity and the use of competency based approaches. In terms of complexity, Company A had several competency models that was different from one branch to another, even though there were many common competency groups, the models were not identical. The

organization roles, experience level required (scale) weren't identical. So you would see different organizational roles in different branches. The competency models were translated in 18 different languages that reflected the multinational nature of their employees. The same applies for the e-learning content. Training materials were presented in several different languages and flavor that reflected the country branch philosophy and technique.

The case study used a *sequential* mixed methods design described by many researchers (Creswell and Plano, 2006; Brannen, 2008). The exploratory case study research design described by Creswell and Plano (2006) is shown in Figure 3.1, the figure shows the use of mixed methods in developing an instrument that is used in successive phases of the design.

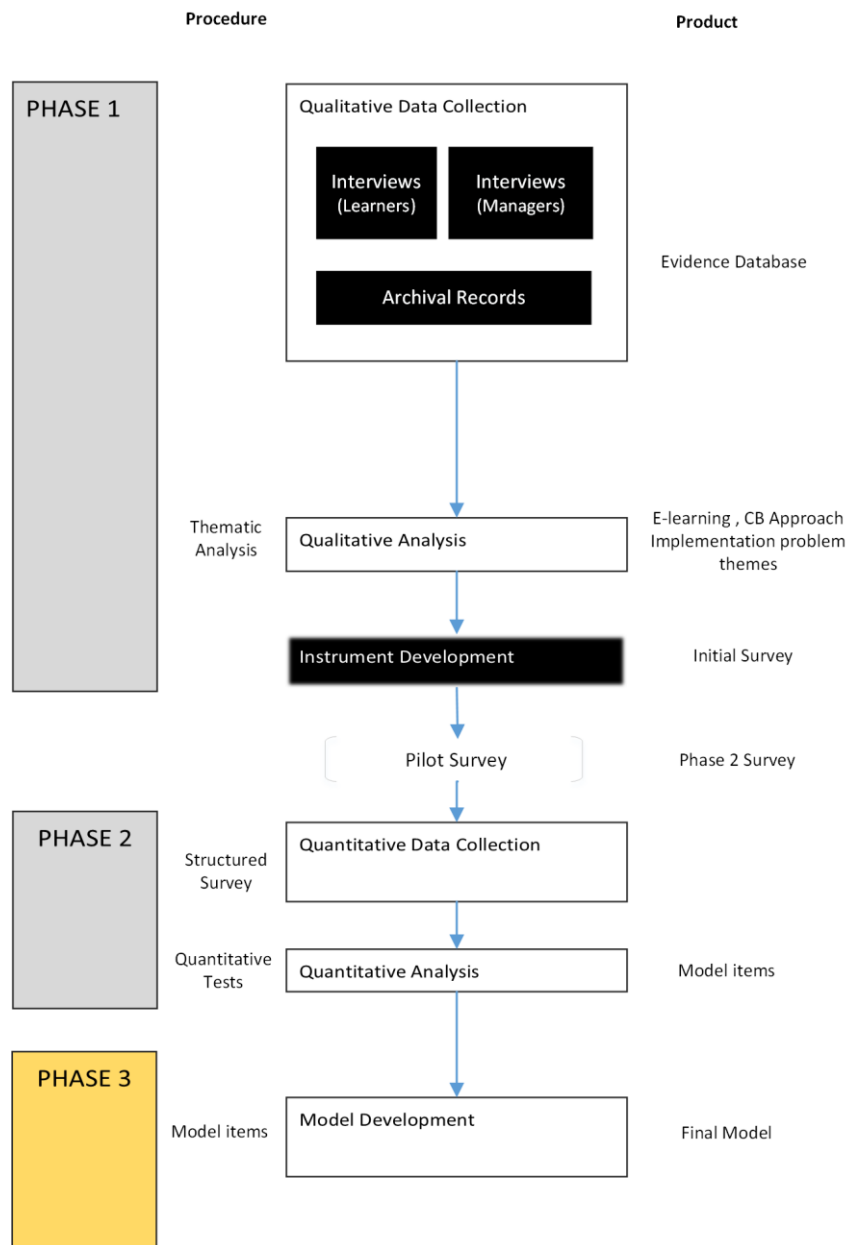


**Figure 3.1:** Exploratory design instrument development model by (Creswell and Plano, 2006).

The design shows both qualitative and quantitative methods are used in a single (mixed) design. The design starts with the qualitative data collection and analysis, then an instrument is developed in order to be used in successive phases of the study, finally the quantitative data collection, data analysis and interpretation is performed.

The research strategy was to divide the work into three main phases: in the first phase, Implementation problems for the e-learning program were collected extensively. Interviews, documentation, and archival records were used to achieve this purpose. Based on the problems noticed in the learning program over the last years combined with literature, a set of possible best practices for e-learning implementation are to be developed. These best practices will set the stage for the survey instrument which will help collecting more quantitative data that is used in the second phase. In the third phase a framework will then be developed based on the results of the two previous phases.

Building on Creswell and Plano (2006) designs, Figure 3.2 shows the complete design for this research. The design is divided into three main phases: Qualitative data collection and analysis (Phase I), Quantitative data collection and analysis (Phase II), e-learning implementation model development (Phase III). In *Phase I*, the qualitative data was collected and analyzed, two main data sources were used in this phase including interviews and archival records. *Phase II* of the design includes the collection and analysis of quantitative data. Survey instrument developed (explained later in this chapter) in order to collect opinions on possible practices which might help overcome e-learning implementation problems. The last design part shows Phase III where a competency based e-learning (CBeL) framework is developed based on the data analysis of the previous phases.



**Figure 3.2:** Research Design Phases

### 3.4 Case Study Design Components

Yin (2009) has defined *five* components for the case study research design; the case study questions, the study propositions, unit of analysis, logic linking the data to propositions and finally the criteria for interpreting the findings.

### *Case Study Questions*

The *case study questions* have been defined as “What are the main factors affecting a successful implementation of e-learning in corporations”, also to “Explore the recent difficulties that accompanying the implementation of e-learning in corporations”.

### *Case Study Propositions*

The second component of case study research is the study propositions. The study propositions grab the attention to what exactly should be studied, propositions were not clear until Phase I of the research was complete. Yin (2009) has explained that for exploratory case studies, proposition might not be clear in the early stages of the study, on the other hand, the purpose of this study was defined clearly as: identifying the main problems affecting successful implementation of competency based e-learning in corporations.

### *Case Study Unit*

The third component of a case study is the unit of analysis. For confidentiality reasons, we will refer to the company subject to the study as “Company A”. Company A is an international multi-branch company which has more than three thousand employees located in multiple branches worldwide. It is considered one of the leading food manufacturers in market with employees coming from thirty-five nationalities and locations around the world including Asia, Europe, North America,

Australia, and Latin America. The company has several innovations and patents translated into products distributed all over the world. Selection of the case for this research has been done carefully. For this research, we needed to study an organization which has implemented e-learning in the past years, also followed a Competency based approaches as a human resources professional development strategy. Table 3.1 highlights the company's main

**Table 3.1: Case study Company profile summary.**

|                                                 |                                  |
|-------------------------------------------------|----------------------------------|
| <b>Organization type</b>                        | International                    |
| <b>Establishment</b>                            | Early 1900's                     |
| <b>Branches count</b>                           | 40 Branch distributed world wide |
| <b>Number of employees</b>                      | 4320                             |
| <b>Implementing e-learning</b>                  | Since 2008                       |
| <b>Implementing Competency based e-learning</b> | Since 2010                       |

The research case unit was the “Company A’s e-learning program”. This case study unit has been selected for several reasons:

- *The maturity of the e-learning program: The e-learning program has been active for several years (since 2010), this fact insured that the program was mature enough for study.*
- *The diversity of the employees engaged in this program: The Company has adopted the e-learning program for several branches in several geographical regions. Learners (Company employees) were coming from different nationalities, departments, backgrounds and cultures. The*

managers sample described later had also the same properties. This second reason insured that cultural context observation is possible.

- *Company A has been using competency based strategies* for a long period, this applies to online and Offline training activities that the Human resources department were implementing. This was also a critical reason, otherwise possible integration of e-learning and competency based approaches could not have been studied.

- *The Connection with the company vendors and managers:* The familiarity of the researcher with the organization managers and vendors have simplified the communication and reduced time required for data collection, keeping within the thesis time limits.

### *Linking Data to Propositions*

The fourth component of case study research is the logic linking the data to propositions. The researcher should have a clear vision on the analytical choices of linking the data collected with the case proposition (Yin, 2009). The design of this case study (described later in this chapter) has explained in details the collection and relations of the data collected in the different study phases.

### *Criteria for Interpreting the Findings*

Defining the criteria for interpreting case study findings is an important component of case study design. Identification to rival theories and frameworks are an important task performed in this stage (Yin, 2008).

eMM Framework is considered as one rival which our study will be compared with when interpreting our findings.

### 3.5 Case Study Protocol

The case study is considered a major way for increasing the case study reliability, the research protocol is a set of guidelines that govern the case study operations before, during and after the research project (Yin, 1994; Mambo, 2003). Table 3.2 shows the case study protocol developed for this research.

**Table 3.2: Case study protocol**

| Topic                   | Description                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Research Questions      | - What are the problems that face organizations in their effort to implement a CBeL program.                                             |
| Design                  | Exploratory Single Holistic Case Study with Mixed Methodology.                                                                           |
| <b>Case Unit</b>        |                                                                                                                                          |
| Case Study Unit         | e-Learning Program of Company A                                                                                                          |
| Case Selection Criteria | e-Learning Program which is implemented in corporates with an HR department following a competency based approaches.                     |
| <b>Data Collection</b>  |                                                                                                                                          |
| Procedure               | - Prepare list of sources<br>- Getting approvals<br>- Conduct Phase I<br>- Conduct Phase II                                              |
| <b>Data Collection</b>  |                                                                                                                                          |
| Data Collection methods | - Interviews, Documents, archival records<br>- Survey for collecting Opinion of possible solutions.                                      |
| Communication means     | - Skype for interviews<br>- Online survey for survey distribution.                                                                       |
| Data collection Plan    | - Data collected and analyzed in two phases. Qualitative → quantitative<br>- Database will be generated to store all collected findings. |
| <b>Analysis</b>         |                                                                                                                                          |
| Findings interpretation | Phase I: compare to rival theories or frameworks (i.e. eMM).                                                                             |

|                               |                                                                                                                                                         |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Answers to research Questions | Phase I (Qualitative data) → Q1<br>Phase II result → Q2                                                                                                 |
| <b>Validity</b>               |                                                                                                                                                         |
| Construct validity            | <ul style="list-style-type: none"> <li>- Multiple sources of information</li> <li>- Establishing chain of evidence</li> <li>- Expert reviews</li> </ul> |
| Internal validity             | - Internal validity is understood to be most effectively used in causal relationship studies.                                                           |
| External validity             | - Study is generalized to corporates which implements e-learning and using competency based approaches. With a similar size and context.                |

### 3.6 Phase I: Qualitative Data Collection and Analysis

#### 3.6.1 Phase I - Data Collection

In the first phase of this study, both structured and semi-structured interviews were conducted with managers, trainers and learners respectively. Also, documents and archival records were reviewed carefully for potential evidences of implementation problems.

##### 3.6.1.1 Interviews

Researchers have been using interviews in order to collect detailed data about persons, cases or programs. There are three types of interviews: unstructured, structured and semi-structured interviews. The three types vary in the amount of control the researcher has over the interview (Margaret et al., 2009).

Both structured and semi-structured interviews were used in data collection process of Phase I. Semi-structured interviews with program managers were conducted. One reason for using semi-structured interviews is their suitability for exploratory case studies, they allow the capture of

respondent's experience, thoughts and feelings, it also gives a better overview about the case (Hove et al., 2005). Also, semi-structured interviews allow researcher to capture feelings, perspectives, and attitudes comparing to the quantitative collection methods. Open-ended questions were used throughout the interviews in order to encourage participants to respond freely to queries (Kvale, 1996; Bogdan & Biklen, 2003). Probing and/or follow-up questions were used, when necessary, to encourage participants to elaborate on or clarify a response (Denzin & Lincoln, 2000).

It was important to capture experiences from different e-learning perspectives and also different dimensions. In the beginning of the interview an explanation about the study was done. Interviews were held over Skype (voice) and the interview time varied between 25 minutes to 1 hour. During interviews, notes were taken, once the interview was finished, a complete summary of the interview was written using interviewee same words as much as possible.

#### *Interviews participants*

Purposeful sampling in conjunction with criterion sampling was used to select the interviewees of Phase I. Sample size of twenty employees was selected, eight managers from different disciplines and twelve learners. Ritchie et al. (2003) suggest that within qualitative studies the sample size is usually of a small size, this was explained as the phenomena is only required to appear once to be part of the analytical map. Guest et al. (2006) suggested that data saturation usually occurs within the first twelve

interviews and after that very few new phenomena would possibly appear. Creswell (2011) also commented that in relation to sample size it is normal for a qualitative research “to study a few individuals or a few cases” (pg. 209).

Purposeful sampling is a powerful sampling method for selecting small samples purposefully. Purposefully means that the samples selected represent an information-rich cases (Patton, 2015). Yin (2011) defines purposeful sampling as “The selection of participants or sources of data to be used in a study, based on their anticipated richness and relevance of information in relation to the study’s research questions” (p. 311). The selection of interviewees was based on their strong relation with the e-learning program as well as their managerial role and familiarity with different aspects of this program. Two main categories for the interviewees: Managers and learners (regular employees).

Criterion sampling was used as the method to select a purposeful sample of information-rich cases. Criterion sampling is a quality assurance approach which requires a pre-determined criterion of importance to exist in the selected samples. Specific criteria have been established for interview participants: First, the selected managers have been involved in managing the e-learning program for at least four years. Second, the managers need to represent different areas of program management including: Human resources, Technical support and Content authoring, which correspond to different dimensions of e-learning. Third, in order to keep multiple realities and improve reliability, selection of managers included several branches in

different geographical regions. This allowed us to collect the experience of managers which represented different training philosophies.

For the second category of interviewees (Learners/regular employees) The selection was done randomly from the global employee database. The table 3.3 shows a list of participant categories, count per category and list of topics discussed.

**Table 3.3 Interviewee categories and topics discussed**

| <b>Interviewee<br/>(Category)</b> | <b>count</b> | <b>Topics</b>                                                                                                                                                                                                                                                                               |
|-----------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>HR Manager</b>                 | 4            | <ul style="list-style-type: none"> <li>- Training &amp; business process relation</li> <li>- E-learning effectiveness.</li> <li>- Content evaluation.</li> <li>- Employee evaluation</li> <li>- Competency based training topics.</li> <li>- Process Management and Optimization</li> </ul> |
| <b>Instructional Designers</b>    | 1            | <ul style="list-style-type: none"> <li>- Content authoring support</li> <li>- Content Standards</li> <li>- Content objectives and relation to competencies.</li> <li>- Pedagogy.</li> </ul>                                                                                                 |
| <b>Support</b>                    | 2            | <ul style="list-style-type: none"> <li>- End user support</li> <li>- Trainers support</li> <li>- Communication challenges</li> <li>- Technology</li> </ul>                                                                                                                                  |
| <b>Technical</b>                  | 1            | <ul style="list-style-type: none"> <li>- Standards</li> <li>- Systems and integration</li> <li>- Technical challenges</li> </ul>                                                                                                                                                            |
| <b>Learners</b>                   | 12           | <ul style="list-style-type: none"> <li>- General problems and difficulties facing e-learning users.</li> </ul>                                                                                                                                                                              |

### **3.6.1.2 Documents & Archival records**

Documents and archival records were also used in the data collection process of Phase I. Although interviews were the main method of data collection, documents review was performed in order to support or

substantiate participants' statements (Glaser & Strauss, 1967). Documents and archival records helped thickening the description of the case (Esterberg, 2002; Merriam, 2002), also they formed a stable source of information for the case study. Documents and archival records contained exact names, references, dates and fine details of events which formed a very valuable source of information (Holtzhausen, 2001; Yin, 2008). There was many electronic documents and archival records available for the e-learning program, a list of used documents is summarized in Table 3.4:

**Table 3.4 List of documents and archival records of the e-learning program.**

| <b>Document</b>                        | <b>Purpose / Content</b>                                                                |
|----------------------------------------|-----------------------------------------------------------------------------------------|
| Competency Frameworks<br>References    | Description of Role / Competencies for company roles.                                   |
| Courses                                | Training courses materials, content                                                     |
| Course evaluation transcripts          |                                                                                         |
| Training system manuals and references |                                                                                         |
| Support Tracking system                | Collect information about problems the users were facing                                |
| System statistics                      | Information about system usage in general, devices used, countries, access methods etc. |
| Courses statistics                     | Course usage, interactions, content                                                     |
| Learning Management System log records | Wide variety of data about users and content.                                           |
| Course surveys                         | Previously held surveys for collecting opinion about course and its contents.           |

### **3.6.2 Phase I - Data Analysis**

In Phase I the qualitative data collected from the interviews was analyzed using *Thematic analysis* (Guest, 2012; Braun et al., 2012). The purpose of thematic analysis is to discover problem patterns from the data collected

(Lapadat, 2010). Participants responses were coded, the procedure performed for conducting thematic analysis was as follow: Response data were first examined, and main codes and central themes were generated inductively. The responses within the central themes were then re-examined, coding was then refined accordingly when necessary. This process was repeated until final group of central themes were achieved - More about Thematic analysis can be found in the next chapter- Documents and archival records were then reviewed and information that supported or contradicted the data in interviews was also connected and analyzed.

### **3.6.3 Phase I - Survey Instrument Development**

As a result of the Phase I a Survey instrument was developed. The survey was used to assess practices of e-learning implementation in corporations. The survey instrument was designed using a five-points Likert scale. Participants were asked to choose their agreement to the proposed practices based on their perception.

The development survey instrument relied on three main sources of data: a) data collected in Phase I of this study, b) eMM Framework, c) people-CMM Framework. The qualitative data analyzed as a part of *Phase I* was the driving guide for the survey development, the central themes resulted from doing thematic analysis for the interview data have formed the main structure and categories of the survey. The second source of inspiration for

the developed instrument was the eMM Framework developed by Marshall (2010).

The eMM Framework is a quality improvement framework that was developed to address the e-learning maturity in educational institutions (Marshall, 2010). The framework is based on ideas from the famous capability and maturity model (CMM) (Paulk et al., 1993) which was developed to provide a framework for software process benchmarking.

The second framework that was used to form the survey instrument is the “people Capability and Maturity Model” (p-CMM). The p-CMM is a framework that provide best practices in human capital management, it draws a roadmap for continuous improvement for the capability of an organization’s workforce (Curtis et el., 2009). The framework was also built considering several ideas from the CMM Framework.

The survey had fifty questions, questions were categorized in eight groups (Preparation, Content, Support, Management, Pedagogy, Technical, Evaluation and Optimization) these groups were formed by analyzing the problem themes of data collected in Phase I. Each one of the practice groups has 4-10 practices for e-learning implementation in CBT environment as shown in Table 3.5, The survey instrument can be found in Appendix 1.

**Table 3.5 Phase II survey question categories**

| Group                 | Sub-Group  | Question code |
|-----------------------|------------|---------------|
| <b>Preparation</b>    |            | P1-P4         |
| <b>Implementation</b> | Content    | D1-D7         |
|                       | Pedagogy   | L1-L10        |
|                       | Support    | S1-S8         |
|                       | Evaluation | E1-E7         |
|                       | Technical  | T1- T3        |
|                       | Management | O1-O4         |
| <b>Optimization</b>   |            | N1-N5         |

### 3.6.3.1 Phase I - Pilot Study

Pilot surveys are used to address technical, logistics, and other problems that might exist in the main survey (De Vaus, 1993; Edwin et al., 2002). Performing a pilot study is considered an important step in doing case study. Conducting a pilot study would help rising any warnings about inappropriate method or tools used in the research and thus minimizing the failure risks. Performing a pilot survey was important step in this research that increased the validity and reliability of the developed survey instrument (De Vaus, 2001). An external pilot survey was administered to three experts in technical and pedagogical implementation in both educational organizations and corporates. Experts (Listed in Appendix 2) were asked to review and fill the survey and give their comments, each of the three experts has at least 10 years of experience in implementing e-learning programs in multinational organizations worldwide. Notes were then recorded and corrective measures prior the distribution of the survey

for Phase II were taken. The following are notes mentioned by the three experts:

- 1- Some practice sentences were reported to be ambiguous, such sentences were then rephrased in order to better reflect the practice aim.
- 2- It was not clear for the pilot respondents that the survey was intended to collect opinion based on perception, an explicit sentence was shown in bold in the welcoming screen indicated that the survey is collecting data based on “perception” and work experience.

### **3.7 Phase II: Quantitative data collection and analysis**

#### **3.7.1 Phase II - Data Collection**

In Phase II, the quantitative data was collected, the survey instrument developed in (Phase I) was used as an input for this second phase. Surveys have been one of the most popular methods for collecting quantitative data over years. Many reasons for its popularity; surveys are known to have a strong ability to collect big amounts of data at low costs and short times compared to other methods like Observation (Muijs, 2005). In this research, survey was used to collect opinions about best practices used for implementing e-learning in organizations. The survey was distributed electronically for country managers who use the e-learning program as a part of their employees training strategy. A note was printed on the cover page of the survey explaining its purpose, the survey asked users to provide opinions about the suggested e-learning practices and their agreement to these practices based on their *perception* and day to day working life

experience. Results were then exported and analyzed as data analysis section explains.

### *Survey participants*

A purposeful sampling was used to identify respondents for the Phase II survey. A sample size of thirty was collected, the sample included all possible Human resources department managers and trainers who were involved in the program over the past few years. Despite of the small sample size, it was sufficient for performing our analysis as explained in chapter 4.

### **3.7.2 Phase II - Data Analysis**

*In the second phase*, data collected from the best practice survey was quantitatively analyzed, a descriptive analysis was first performed. The Mean, Variance and Ranks were calculated and compared for each of the practices and their corresponding categories. SPSS was used to analyze the survey responses. Survey data was analyzed and normality check was performed. Mann-Whitney U test was used to test opinion differences based on different variables. Also, correlation between different dimensions were analyzed using Pearson Correlation test.

### **3.8 Validity and Reliability of the Collected Data**

Researchers have mentioned three main principles for increasing case study validity and reliability (Yin, 2009; Creswell, 1998), the *first principle* is data triangulation, Patton and Jick (Patton, 2002; Jick, 1979) discussed four

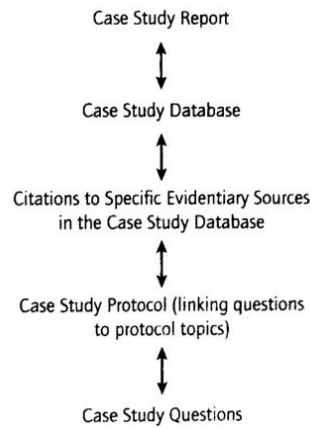
types of data triangulation that improves validity and reliability of data: data triangulation, investigator triangulation, theory triangulation and finally the methodological triangulation. For data triangulation, multiple data sources were recommended to increase validity of data (Carter et al. 2014). In this research, several data sources in different phases were collected, including interviews, surveys, documents and archival records. Having different sources to identify specific problem was an important strategy during our data collection process which has increased the validity of our data and reduced our research bias.

*Cronbach Alpha* test was performed in order to check the validity of the survey questions. The result returned (.749) confirming the validity of the survey questions.

Data was collected from two different populations that represent two perspectives: learner's perspective and trainer/manager perspective, this helped understanding the problem from several sides and also helped emphasizing on some issues and excluded others.

Arranging collected data systematically was crucial in our case, creating a case study database was an important task. This is another important principle emphasized by Yin that said to improve the case study validity. The database included: data source, category, frequency of occurrence, this helped in linking common issues and categorizing them efficiently. The *third principle* that improves the case study reliability is maintaining chain of evidences. Maintaining chain of evidences means that the reader should

be able to follow the path starting from research questions to the data collection process and its relation to research question to the final findings report as shown in Figure 3.3.



**Figure 3.3:** Maintaining chain of evidences (Yin, 2009).

### 3.9 Case Study Generalizability

Single case studies have been criticized for their limited ability for generalizability (Kennedy, 1979; Yin, 2009). Flyvbjerg (2006) has considered this as pure misunderstanding about single case studies. He asserted that one can generalize on the base of single case; the author believes that formal generalization is overvalued as a source of scientific development and that the example power is always underestimated. He also mentioned that strategic selection of the single case plays an important role supporting its generalizability.

Kennedy (1979) mentioned that not even in group studies one can generalize evidences. The fact that generalization of evidence is subject to judgment of some degree rather than being a binary activity. Moreover, the

generalization is not a function of the observed units, but more important is the nature of units observed. That is; the context as well as the range of characteristics of the units investigated increases the range of characteristics of the population to which generalization is possible. Finally, the analogy of comparing samples and universes is not valid when it comes to case studies considering the fact that survey research relies on statistical generalization where case studies relies primarily on analytical generalization.

### **3.10 Ethical Considerations**

The researcher followed a step by step procedure to get acceptance from the participating organization to perform this case study. First a letter for request to research was submitted to the company headquarter human resource management with detailed description of the study topic and its scope. Two weeks later, acceptance was granted with explicit condition that organization should be anonymous. The next step was communicating with the participating HR representative in different country branches about the study and possible expected participation nature in the following months. It is important to mention that the researcher prior experience with the organization and previous connections with the key decision makers in the HR department has dramatically reduced the communication time required to get the acceptance for performing this case study. Access to sample courses and other data was then requested and received in later stage of the research.

The researcher followed a strict ethical principle and specifically adhered to the following.

1. Research objectives were explained in details in order to eliminate any ambiguity.
2. In interviews, respondents consent had been sought.
3. During interviews, purpose of the study was explained and questions were repeated and clarified when required.
4. Identity of the respondents has not been revealed throughout the study.
5. Data collected from learning systems did not have any names or identification numbers of learners or managers.

Appendix 1 includes a letter for the human resources management sent and the response received. For confidentiality reasons, names of connection to the organization were blurred.

### **3.11 Summary**

In this chapter, the research methodology, design, data collection and analysis techniques was discussed. An exploratory single case study with a mixed methodology was described. The research incorporated two main phases conducted sequentially, a qualitative and quantitative respectively. As a result of the first phase a survey tool was developed and used for the data collection process in the second phase. The data analysis techniques and participants sample for each phase were also presented in this chapter.

## **Chapter 4**

### **Data Analysis & Discussion**

#### **4.1 Overview**

This chapter presents both the qualitative and quantitative results from different research phases. Both qualitative and quantitative results are described. Qualitative data was collected by conducting both a structured and semi-structured interview. Also, different data sources such as archival records, LMS logs and course statistics were used to match results of the interviews. On the other hand, survey was used to collect data from managers to check their perception on the possible solutions proposed. Next, we present the results of data analysis for both the qualitative and quantitative parts.

#### **4.2 Qualitative Analysis (Phase I)**

Thematic analysis was used to analyze the interviews data in this phase, evidences from different sources were also investigated and matched to interviewees answers when possible.

The used data sources included: LMS system statistics and logs, infrastructure statistics and usage meters, course statistics and support system data.

### 4.2.1 Thematic Analysis (Learners and Managers)

Six main themes have emerged from analyzing the responses of the program managers and trainers. These themes are summarized as follows (Content, Management, Pedagogy, Technical, Support and Evaluation). Table 4.1 summarizes codes, issues discussed and the themes emerged from these interviews.

**Table 4.1 Themes table**

| Code                                                                                                                                                                                                                         | Issues discussed                                     | Central Theme            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------|
| <ul style="list-style-type: none"> <li>- Interactivity</li> <li>- More Multimedia</li> <li>- Less text</li> <li>- Embedded questions</li> <li>- Boring</li> <li>- Short e-sessions</li> <li>- Activities per user</li> </ul> | Interactivity                                        | Content Related Problems |
|                                                                                                                                                                                                                              | Localization                                         |                          |
|                                                                                                                                                                                                                              |                                                      |                          |
|                                                                                                                                                                                                                              | Motivation and engagement                            |                          |
| <ul style="list-style-type: none"> <li>- Completion</li> <li>- ROI</li> <li>- Time</li> <li>- Budget</li> <li>- Resources</li> </ul>                                                                                         | Completion / Progress                                | Management Problems      |
|                                                                                                                                                                                                                              | Budget constraints                                   |                          |
|                                                                                                                                                                                                                              | Skills Management difficulty                         |                          |
|                                                                                                                                                                                                                              | ROI identification                                   |                          |
|                                                                                                                                                                                                                              | Time related issues                                  |                          |
|                                                                                                                                                                                                                              | Gamification                                         |                          |
|                                                                                                                                                                                                                              |                                                      |                          |
| <ul style="list-style-type: none"> <li>- Skills</li> <li>- Learning path</li> <li>- Completion</li> <li>- Coaching</li> <li>- Learning activities</li> <li>- Learning paths</li> </ul>                                       | Integration with Role Competencies                   | Pedagogy Problems        |
|                                                                                                                                                                                                                              | Users skills variations                              |                          |
|                                                                                                                                                                                                                              | User completion tracking Regular instructing methods |                          |
|                                                                                                                                                                                                                              |                                                      |                          |
| <ul style="list-style-type: none"> <li>- User technical experience</li> <li>- Devices</li> <li>- IT Policies</li> <li>- Communication</li> </ul>                                                                             | Varied technical experience of employees             | Technical Problems       |
|                                                                                                                                                                                                                              | Different platforms/devices issues                   |                          |

|                                                                                                                                                           |                                          |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------|
| <ul style="list-style-type: none"> <li>- Content technologies</li> <li>- Software Upgrade</li> <li>- Infrastructure</li> <li>- Content support</li> </ul> | Content & infrastructure Standardization |                  |
|                                                                                                                                                           |                                          |                  |
| <ul style="list-style-type: none"> <li>- HR Guidance</li> <li>- Procedures</li> <li>- Multi-layer support</li> <li>- Support language</li> </ul>          | Content authoring support                | Support Problems |
|                                                                                                                                                           | Technical support                        |                  |
|                                                                                                                                                           | HR Support                               |                  |

#### 4.2.1.1 Theme1: Content Related Problems

The content problems have been identified by interviewing the learners of the program, four different sub-themes were identified which have bugged the learners of the e-learning program. The following are the details of each of these subdomains:

##### *Interactivity and Gamification*

Although many learners have reported that the learning content has achieved its objectives, they demanded a higher level of interactivity embedded within the course contents; a higher level of interactivity includes more videos, images and quick embedded questions with less text. One respondent has reported:

“We want to see different ways of presenting the info, like video/pictures/text”

Another trainer has also commented on the same topic:

“We need new game designs for learning purposes, it will help deliver the message and increase retention time.”

It is important to note that having interactive content was one of the most frequent demands reported by the interviewees. The word (interactive, game like) has appeared twenty two times during the interviews.

### *Localization*

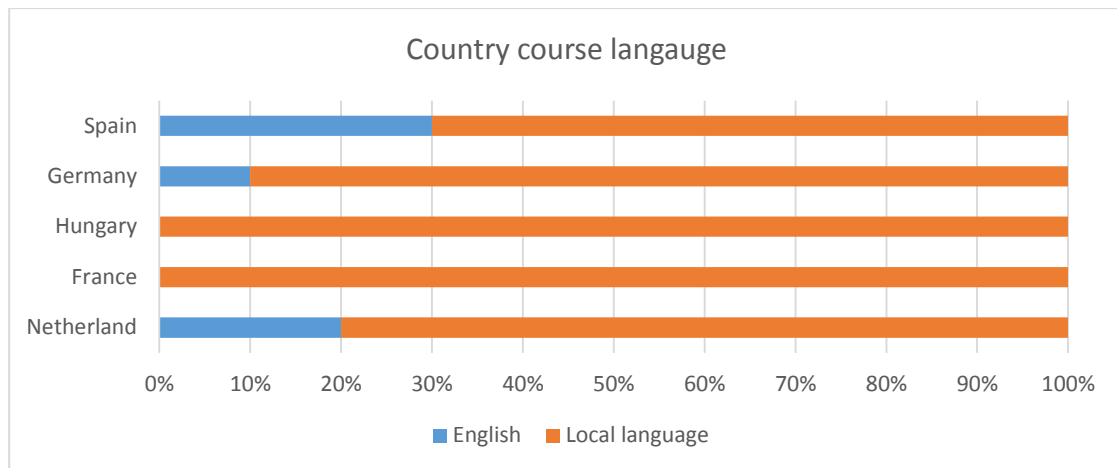
As mentioned earlier, “Company A” is well known as an international organization, employees were coming from different countries speaking several languages including English, French, German etc. Even though English is considered the main language used, several learners have reported problems having learning content not tolerated to their local language.

Learners reported that having online learning courses developed in different language has reduced their learning motivation and made learning new things less enjoyable.

John has reported:

“Some courses are in Dutch, not easy for us...”

On the other hand, the course statistics pulled from the archival records of the LMS -described in Figure 4.1- shows that over seventy percent of the e-learning courses developed were in the country’s local language.



**Figure 4.1:** Country course language.

#### 4.2.1.2 Theme 2: Management Problems

The second theme categorizes problems related to management procedure, processes and strategic considerations that cause efficiency problems for the e-learning program.

##### *Completion / Progress Tracking*

In spite of the vast techniques of completion tracking the LMS provided for tracking courses, several managers have expressed their need for a better overview of employees' achievements connected to the human resources professional development plans. Limited tracking was done through excel exports and manual analysis for individual courses which consume a lot of time and hindered the process efficiency. One Manager mentioned:

“In order to have a better planning for the program, we would like to have an easier way to maintain a global overview about the current learner, department and branch learning activity progress”.

### *Budgets constraints*

Through the interviews the word “budget” has appeared in several occasions, i.e. one internal content author reported that she spends long time developing the online courses and she couldn’t use external support due to budget constraints.

“I spend a lot of time on the development of the training program, unfortunately it was not possible to outsource some of the work outside due to high costs and budget constraints”

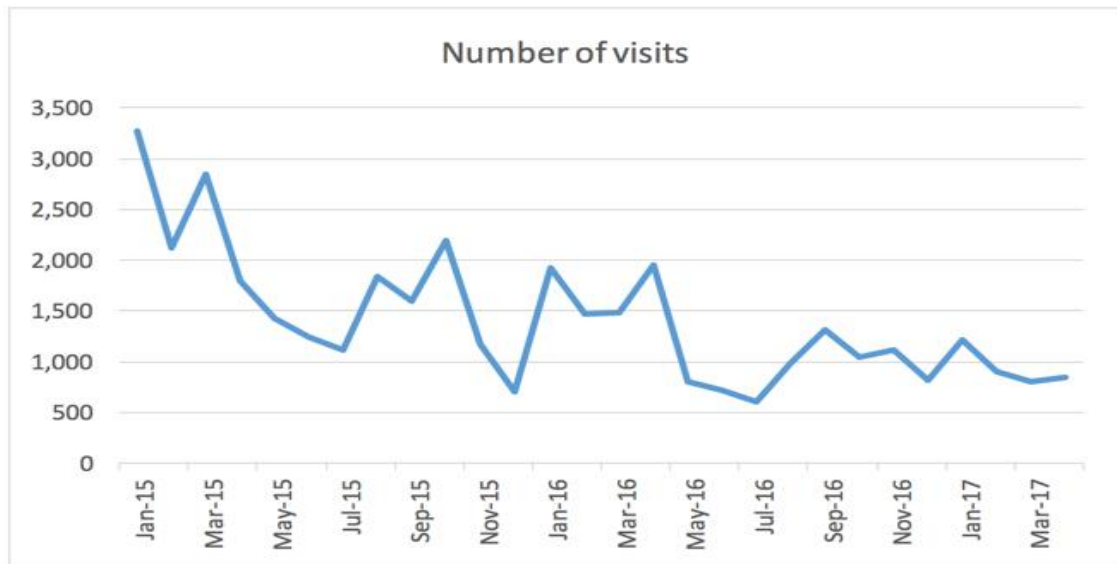
Also, as an observation, there have been plans on improving the LMS. This included the optimization of the graphical user interface, building better reporting tools and modules that integrates better with the current HR software. some of the plans were delayed to next year due to insufficient budget.

### *Motivation and engagement*

Interviews for learners and managers have revealed issues related to the learner motivation. Some of the learners commented that they are bored of taking some of the courses. One respondent mentioned:

“A bit boring - could have been more interactive”

Figure 4.2 shows the number of visits to the LMS over period of 27 months. The figure shows a clear deterioration in the number of courses visits. This comes aligned with several interviews testimonies.



**Figure 4.2:** e-Learning system number of visits over 27-month period.

## ROI

One manager reported a difficulty in identifying return on investment (ROI) of the e-learning program, he mentioned:

“We believe we need to have more KPIs in order to make decision about the ROI of our program, and this should be investigated in the near future”.

### 4.2.1.3 Theme 3: Pedagogy Problems

In spite of the fact that the company was using competency based approaches to manage the learning and development of their employees, interviewees have reported some issues related to clarity of connection between the published e-learning courses and relation to their role

competencies. Even though the course evaluation activity results were shown instantly, the respondents have shown a discomfort about the clarity of their learning paths.

These varying experiences among the learners were raising a discomfort among users caused by the level diversity of the training material. A trainer has mentioned:

“Diversity of the group is considered a difficulty (some will feel the material is basic, while others will find it very challenging)”.

Also, one learner commented uncomfortably:

“Since I am a scientist, I already understand and know most of the topics presented but it was very useful to revise the knowledge gained in years effectively in a couple of hours...”

#### **4.2.1.4 Theme 4: Technical Problems**

The fourth theme revealed concerns related to technology used in implementing e-learning, since 2010, several technologies have dominated how the e-learning training materials were designed and presented. The interviewees mentioned difficulties related to adapting old learning materials to meet the fast advances in web and smart phone technologies. Courses designed in the first period of e-learning program needed to be rebuilt to meet the new web standards evolving over 5 years' time span, as an example is the use of Adobe flash components within the training materials, using Adobe Flash did not integrate well on many mobile

devices, this has raised several technical and financial issues. One course content author mentioned: “We had to rebuild many courses to meet the new HTML5 technology in order to allow courses to be viewable on smart phones and tablets.”

Archival records for LMS statistics have shown a variety of devices and operating systems used to browse the courses from both inside and outside the company. Table 4.2 shows the variety of devices and their usage percentage.

**Table 4.2 PC and Mobile browsers usage percentage**

| <b>PC Browser</b>        | <b>Usage %</b> | <b>Mobile Device browser</b>                  | <b>Usage %</b> |
|--------------------------|----------------|-----------------------------------------------|----------------|
| <b>Internet Explorer</b> | 74.64%         | Apple iPhone                                  | 34.29%         |
| <b>Chrome</b>            | 16.00%         | Microsoft Windows RT Tablet Windows RT Tablet | 29.17%         |
| <b>Safari</b>            | 4.45%          | (not set)                                     | 19.23%         |
| <b>Firefox</b>           | 3.05%          | Apple iPad                                    | 9.94%          |
| <b>Edge</b>              | 1.64%          | Microsoft Xbox One                            | 3.21%          |
| <b>Others</b>            | 0.15%          | others                                        | 1.60%          |

This variety of devices and technologies used to browse the learning content presented a big challenge for the technical staff to keep all learning contents working, up to date and well aligned with those technologies.

During the interviews, it was mentioned that the company has invested in cutting edge e-learning technologies. Monitoring system records showed a remarkable high level of availability (99.8%) over three-year time span for all branches.

#### 4.2.1.5 Theme 5: Support Problems

This fifth theme describes support related difficulties faced by the support team. Difficulties were related to varying technical experiences among the employees, some issues were trivial, on the other hand, the support team took longer time to investigate possible causes due to insufficient information from the user.

Language issue was also reported, one of the branches trainers commented on support:

“Support is currently given in English, not all our employees prefer using English language in communication”

Reviewing the support tracker system records, the issues received could be categorized into four categories as shown in table 4.3

**Table 4.3 Support Ticket / Issue categories**

| <b>Topic</b>                                | <b>Tickets percentage</b> |
|---------------------------------------------|---------------------------|
| Content related questions                   | 37.3%                     |
| Registration and login questions            | 12.1%                     |
| Technical issues (sound, video .. etc)      | 35.4%                     |
| Others (forwarded to different departments) | 15.2%                     |

For the technical related problems, external technical support team was handling the issues, which forwarded the non-technical problems to the course creator by default. In some cases, this process was not optimal, as the course creator might have left the company or may have changed to

different positions. Finding the exact support person for that content increased the ticket response time dramatically.

### **4.3 Quantitative analysis (Phase II)**

#### **4.3.1 Demographic Analysis**

Data collected in Phase II survey was analyzed, the following are the main characteristics of the participants of this survey.

##### **4.3.1.1 Organization Role**

Survey respondents were categorized into two main organizational roles: Trainers and HR Managers; the managers formed (51.7%) of the respondents, where the rest (48.3%) were trainers. Table 4.4 summarizes these results.

**Table 4.4 Respondents distribution based on their role**

| <b>Respondent Role</b> | <b>Percentage %</b> |
|------------------------|---------------------|
| <b>Managers</b>        | 51.7%               |
| <b>Trainers</b>        | 48.3%               |

##### **4.3.1.2 Years of Experience**

The survey respondents have varying years of experience. (44.8%) of respondents had (3-5) years of experience, (24.1%) with (6-10) years, (31%) of respondents mentioned higher years of experience (more than 10 years). Table 4.5 summarizes these results.

**Table 4.5 Respondents distribution based on their experience**

| <b>Years of experience</b> | <b>Percentage %</b> |
|----------------------------|---------------------|
| <b>3 – 5</b>               | 44.8%               |
| <b>6 – 10</b>              | 24.1%               |
| <b>More than 10 years</b>  | 31 %                |

#### **4.3.1.3 Country**

Survey respondents were reflecting several nationalities and cultures, they were coming from six different company branches: Germany (31%), Netherland (20.7%), UK (13.8%), Hungary (6.9%), France (17.2%), Spain (10.3%). As summarized in Table 4.6.

**Table 4.6: Respondents distribution based on their country.**

| <b>Country / Branch</b> | <b>Percentage %</b> |
|-------------------------|---------------------|
| <b>Germany</b>          | 31%                 |
| <b>Netherland</b>       | 20.7%               |
| <b>UK</b>               | 13.8%               |
| <b>Hungary</b>          | 6.9%                |
| <b>France</b>           | 17.2%               |
| <b>Spain</b>            | 10.3%               |

#### **4.3.1.4 Implementation Practices**

The developed survey tool had 50 questions divided into eight main groups: preparation, content, pedagogy, support, evaluation, technical, management and optimization. Each group has assessed a set of practices required for e-learning competency based implementation. Generally speaking, respondents have shown a high percentage of agreement for most

group practices. Although some practices got varying results as described in the next section. Next, we go over the results for each of the survey practice groups:

#### 4.3.1.4.1 Preparation

The *Preparation* practices have four main questions. The practices assessed whether the organization should have a documented business process objectives and defined performance indicators would help improve the e-learning implementation process, respondents answered positively with a mean of (4.27) showing a high level of acceptance. Having an up to date competency framework as a driver for the learning activities got a very high acceptance level among respondents with a mean of (4.53). Complete results are summarized in Table 4.7.

**Table 4.7: Preparation practices group**

| Practice                                                                                                        | Mean | Rank | Std. Deviation | Level     |
|-----------------------------------------------------------------------------------------------------------------|------|------|----------------|-----------|
| <b>P1.</b> Organization should have an up to date competency framework in order to drive learning activities    | 4.53 | 1    | .507           | Very High |
| <b>P2.</b> Organization should have a documented business process objectives and defined performance indicators | 4.27 | 2    | 0.64           | High      |
| <b>P3.</b> Institutional learning and strategy should explicitly address competency driven e-learning           | 3.93 | 3    | .74            | High      |
| <b>P4.</b> A Team should be formed to manage both the implementation and the optimization processes             | 3.9  | 3    | .481           | High      |

Also in this group, the respondents were asked if explicitly addressing competency driven e-learning as a strategy for institution learning would improve the implementation process of e-learning, the respondents have highly agreed with a mean of (3.93). Almost similar agreement level was also reported on the importance of having a team to drive the implementation process of e-learning.

#### 4.3.1.4.2 Content

This practice group investigates the content-related practices which might assist a better implementation of e-learning in corporations.

**Table 4.8 Content practices group**

| Practice                                                                                                                                               | Mean  | Rank | Std. Deviation | Level     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|----------------|-----------|
| <b>D1.</b> Courses should be designed with disabled employees needs taken in considerations.                                                           | 4.633 | 1    | .4901          | Very High |
| <b>D2.</b> E-learning resources designed should be explicitly linked to the corresponding business competencies.                                       | 4.167 | 2    | .712           | High      |
| <b>D3.</b> Designed courses and training materials should support as much devices and operating systems as possible (Mobile ,PC, etc) .                | 4.07  | 3    | .785           | High      |
| <b>D4.</b> An explicit plan should link e-learning technology, pedagogy and content used in courses.                                                   | 3.97  | 4    | .556           | High      |
| <b>D5.</b> E-learning resources should be designed and managed to maximize reuse and resource sharing.                                                 | 3.9   | 5    | .712           | High      |
| <b>D6.</b> Course development, design and delivery should be guided by e-learning procedures and standards.                                            | 3.87  | 6    | .346           | High      |
| <b>D7.</b> Learner profile competencies levels should be updated periodically manually or by an automatic trigger on training material accomplishment. | 3.77  | 7    | 1.006          | High      |

The top practice which got the highest mean of (4.633) is the importance of designing e-learning courses with disabled employee in consideration. Connecting e-learning resources explicitly with corresponding business competency has achieved an acceptance mean of (4.167). Respondents also emphasized on the importance of designing the training material to support as much devices as possible which come on the third place of importance in this group. Maximizing the use of training resources (content) has also been reported of a big importance with an acceptance mean of (3.90). Using explicit standards and procedures for designing content materials was also remarked as an important practice that would improve the implementation overall process. Finally, the respondents agreed that the level of user experience should be updated automatically or manually to reflect the user improved experience level and learning accomplishments. ). Complete results are summarized in Table 4.8

#### **4.3.1.4.3 Pedagogy**

The pedagogy practice group had questions about pedagogical practices which may lead to better implementation of e-learning. agreement with a mean of (4.17) was achieved on the necessity of deriving learning objectives from system objectives in the design and implementation phase of the courses. Having a mean for trainees interaction with training staff has got a very high percentage of agreement with a mean of (4.27). Also, several other questions got a considerably high level of agreement including the question whether the employees should be provided with an e-learning skill development, in-course communication response time

(when communicating with trainers and support), and performance feedback for each course. The question about whether courses should be designed to increase the interactivity and engagement to users have got also a very high level of acceptance among the respondents.

The respondents were also asked whether learning plans should be subject to timetables, the results also have shown a high level of agreement with a mean of (4.1). Having course designed to support diverse levels of learning styles and learner capabilities was also marked as one of the highest ranks of this questions group. Complete results are summarized in Table 4.9.

**Table 4.9 Pedagogy practices group**

| Practice                                                                                                                  | Mean | Rank | Std. Deviation | Level     |
|---------------------------------------------------------------------------------------------------------------------------|------|------|----------------|-----------|
| L1. Courses design needs to support diverse learning styles and learner capabilities.                                     | 4.37 | 1    | .49            | Very High |
| L2. Learning designs and activities should actively engage employees                                                      | 4.37 | 1    | .556           | Very High |
| L3. Employees need to be provided with mechanisms for interaction with training staff and other Employees.                | 4.27 | 2    | .434           | Very High |
| L4. Learning objectives derived from business processes objectives should guide the design and implementation of courses. | 4.17 | 3    | .379           | High      |
| L5. Learning plans should be subject to specified timetables and deadlines.                                               | 4.1  | 4    | .759           | High      |
| L6. Employees should receive feedback on their performance within courses.                                                | 4.07 | 5    | .64            | High      |
| L7. Employees need to be provided with e-learning skill development.                                                      | 3.97 | 6    | .765           | High      |
| L8. Preliminary assessments should be performed to reveal possible competency gaps and form the basis for learning plans. | 3.97 | 7    | .556           | High      |
| L9. Assessment should be designed to progressively build learner competence.                                              | 3.87 | 8    | .507           | High      |
| L10. Employees need to be provided with expected staff response times to employee communications.                         | 3.87 | 9    | .434           | High      |

#### 4.3.1.4.4 Support

The Support group practices investigated support activities from different perspectives, respondents emphasized with a mean of (4.37) that human resources should be providing assistance for learners in their current and future learning paths. Managers and learners also confirmed with a very high acceptance level that learners' questions should be collected and documented formally. On the other hand, importance of providing human resource support for content authors was among the highest three practices which found high acceptance in this group.

Personal support to learners, content authors, technical support and providing technical support to learners had a matching mean and rank of (5). Providing pedagogical and professional development support for the training staff was also remarked with a high importance. Finally, providing employees with library facility didn't find high acceptance among the participants.. Complete results are summarized in Table 4.10

**Table 4.10: Support practices group**

| Practice                                                                                                                          | Mean | Rank | Std. Deviation | Level     |
|-----------------------------------------------------------------------------------------------------------------------------------|------|------|----------------|-----------|
| S7. Employees should be provided with periodic HR support on their current and future learning paths                              | 4.37 | 1    | .49            | Very High |
| S3. Employees enquiries, questions and complaints should be collected and managed formally.                                       | 4.20 | 2    | .484           | Very High |
| S8. Content authors need to be provided with HR support to ensure that the courses developed fits the required competency levels. | 4.13 | 3    | .507           | High      |

|                                                                                                                              |      |   |      |          |
|------------------------------------------------------------------------------------------------------------------------------|------|---|------|----------|
| S1. Employees need to be provided with technical assistance when engaging in e-learning.                                     | 4.03 | 4 | .615 | High     |
| S4. Employees need to be provided with personal and learning support services when engaging in e-learning.                   | 4    | 5 | 0    | High     |
| S6. Local content authors staff should be provided with technical support in using digital information created by Employees. | 4    | 5 | 0    | High     |
| S5. Training staff has to be provided with e-learning pedagogical support and professional development.                      | 3.8  | 6 | .407 | High     |
| S2. Employees need to be provided with library facilities when engaging in e-learning.                                       | 3.2  | 7 | .805 | Moderate |

#### 4.3.1.4.5 Evaluation

The evaluation group have assessed the acceptance of respondents to courses, process and learner evaluation practices. Providing a feedback from learners to content has the highest rank in this group with a mean of (4.33). The practice of performing regular reviews on e-learning courses has got a very high mutual agreement with rank of (2). Collecting learners, trainers and manager's feedback regularly was ranked in the third, fourth and sixth places of this group. Providing employees regular overview about their current and expected competency levels has also got high acceptance with a mean of (4.20). Respondents also highly agreed that embedding measurements within the training material would highly determine the performance of the training and development activities. Complete results are summarized in Table 4.11

**Table 4.11: Evaluation practices group.**

| Practice                                                                                                                                        | Mean | Rank | Std. Deviation | Level     |
|-------------------------------------------------------------------------------------------------------------------------------------------------|------|------|----------------|-----------|
| E1. Employees should be able to provide feedback about their experience on the quality of content in improving their competencies.              | 4.33 | 1    | .379           | Very High |
| E2. Regular reviews of the e-learning aspects of courses need to conducted.                                                                     | 4.23 | 2    | .679           | Very High |
| E3. Employees should be provided with mechanism to have an overview about their current competency level and expected standard.                 | 4.20 | 3    | .407           | High      |
| E4. Employees should be able to provide regular feedback on the quality and effectiveness of their e-learning experience.                       | 4.17 | 3    | .479           | High      |
| E5. Training staff should be able to provide regular feedback on quality and effectiveness of their e-learning experience.                      | 4.10 | 4    | .305           | High      |
| E6. Measurements should be embedded within a training materials to determine the status and performance of Training and Development activities. | 4    | 5    | .525           | High      |
| E7. Managers should be able to provide feedback about their experience on the quality of content in improving their followers competencies.     | 3.77 | 6    | .935           | High      |

#### 4.3.1.4.6 Management

Management practices investigated the possibilities of improving the implementation process of e-learning. Defining formal resource allocation criteria for e-learning activities was reported as an important factor for a successful e-learning implementation, it has been ranked as number one factor in this group. Explicitly addressing e-learning as part of organization strategy has also got a high agreement with a mean of (3.90). Importance of explicit planning for e-learning has achieved the third position with rank of

(4) in this category. Stating explicit plans to drive e-learning in organization got also relatively high mean of (3.63).

**Table 4.12: Management practices group.**

| Practice                                                                                                             | Mean | Rank | Std. Deviation | Level |
|----------------------------------------------------------------------------------------------------------------------|------|------|----------------|-------|
| <b>O1.</b> Formal criteria should guide the allocation of resources for e-learning design, development and delivery. | 4.13 | 1    | .346           | High  |
| <b>O3.</b> Digital information use has to be guided by an institutional information integrity plan.                  | 3.93 | 2    | .450           | High  |
| <b>O2.</b> Institutional learning and training policy and strategy needs to explicitly address e-learning.           | 3.90 | 3    | .403           | High  |
| <b>O4.</b> E-learning initiatives should be guided by explicit development plans.                                    | 3.63 | 4    | 1.066          | High  |

#### 4.3.1.4.7 Technical

The technical practices assessed the agreement on four main practices. Infrastructure reliability and robustness and integration standards importance has got the highest rank in this category with a mean of (4.365). Explicit planning for e-learning technology as a mean of making technology decision has got a mean of (3.93) in this group.

**Table 4.13: Technical practices group**

| Practice                                                                                                          | Mean  | Rank | Std. Deviation | Level     |
|-------------------------------------------------------------------------------------------------------------------|-------|------|----------------|-----------|
| <b>T1.</b> All elements of the physical e-learning infrastructure should be reliable, robust and sufficient.      | 4.365 | 1    | .5561          | Very High |
| <b>T2.</b> All elements of the physical e-learning infrastructure needs to be integrated using defined standards. | 4.365 | 1    | .4901          | Very High |
| <b>T3.</b> E-learning technology decisions has to be guided by an explicit plan.                                  | 3.93  | 2    | .365           | High      |

#### 4.3.1.4.8 Optimization

The last group assessed by the survey is the optimization practices. These practices assess the optimization practices required to maintain a dynamic implementation of e-learning.

Regular review for business objectives and performance indicators practice has got the highest rank in this group with a mean of (4.31). Reviewing measurements on multiple levels of the organization have got also a high acceptance of this group. Reflecting the change in business objectives on the content material have got an agreement level with a mean of (3.66) which is considered high. Finally, reviewing new e-learning technologies used regularly and keeping up to date with new technologies was ranked as number (5) with a relatively high acceptance.

**Table 4.14: Optimization practices group.**

| Practice                                                                                                                                                         | Mean | Rank | Std. Deviation | Level     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|----------------|-----------|
| <b>N1.</b> Business Objectives and Performance Indicators are to be regularly reviewed and necessary changes to corresponding competencies should be reflected . | 4.31 | 1    | .466           | Very High |
| <b>N5.</b> Measurements embedded in content should be aggregated and data should be reviewed on both unit and organization levels.                               | 3.83 | 2    | .434           | High      |
| <b>N4.</b> Remarkable improvement in competencies should be automatically notified and possibly rewarded.                                                        | 3.79 | 3    | .626           | High      |
| <b>N2.</b> Business Objectives and Performance Indicators are to be regularly reviewed and                                                                       | 3.66 | 4    | .466           | High      |

|                                                                                                                                                                   |      |   |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---|------|------|
| necessary changes to corresponding Training material and should be reflected .                                                                                    |      |   |      |      |
| <b>N3.</b> New e-learning technologies and tools that would enhance employee learning should be identified regularly and action should be taken to provide them . | 3.45 | 5 | .572 | High |

#### 4.3.2 Comparing Manager and Trainer's opinions

Analysis was performed to explore if there are any significant differences in the opinions of these practices based on respondent position. First a normality check was conducted. Setting Alpha  $\alpha$  as (.05), **Kolmogorov-Smirnov** Test for normality revealed p value is less than .05 for each of the survey questions. This indicates that the data is not normally distributed. Complete test results of normality can be found in **Appendix1**.

Considering the non-parametric nature of the data, **Kruskal Wallis** U test was applied to reveal if there was any significant difference in opinions between managers and trainer. The complete results of U-Test can be found in Appendix 1.

It worth mentioning that despite the small sample size it was sufficient to perform the tests. Several researchers have justified the use of minimum sample size of thirty while analyzing non-parametric data. (Corder,2009; Pett, 1997; Salkind, 2004)

**H0:** There is a significant difference between the opinion of managers and trainers on the presented practices.

Using SPSS to analyze the data, the significance value ( $p > 0.05$ ) for each of the survey practices, this would reject our null hypothesis for this test, thus, we can conclude that there is no significant difference between the managers and trainer's opinions on any of the described practices.

#### **4.3.3 Correlation between different CBeL dimensions**

Different relations between CBeL dimensions were analyzed, Table 4.17 shows Pearson Correlation results for correlation between different dimensions, the table shows clearly that there is strong correlation between different dimensions of the CBeL implementation process.

Table 4.16 shows the result of Pearson correlation between different implementation dimensions, the results shows the Significant values for several pairs ( $p < 0.05$ ) and ( $p < 0.01$ ) for several dimensional pairs. This comes to emphasize that the implementation dimensions are highly correlated.

**Table 4.17 Correlations between different CBeL dimensions**

|                                                              |                 | Content | Pedagogy | Support | Evaluation | Management | Technology |
|--------------------------------------------------------------|-----------------|---------|----------|---------|------------|------------|------------|
| Content                                                      | Correlation     | 1       | -.094    | .738**  | .890**     | -.346      | .366*      |
|                                                              | Sig. (2-tailed) |         | .622     | .000    | .000       | .061       | .047       |
|                                                              | N               | 30      | 30       | 30      | 30         | 30         | 30         |
| Pedagogy                                                     | Correlation     | -.094   | 1        | -.061   | .119       | .321       | .534**     |
|                                                              | Sig. (2-tailed) | .622    |          | .750    | .531       | .084       | .002       |
|                                                              | N               | 30      | 30       | 30      | 30         | 30         | 30         |
| Support                                                      | Correlation     | .738**  | -.061    | 1       | .691**     | -.306      | .281       |
|                                                              | Sig. (2-tailed) | .000    | .750     |         | .000       | .101       | .133       |
|                                                              | N               | 30      | 30       | 30      | 30         | 30         | 30         |
| Evaluation                                                   | Correlation     | .890**  | .119     | .691**  | 1          | -.149      | .538**     |
|                                                              | Sig. (2-tailed) | .000    | .531     | .000    |            | .433       | .002       |
|                                                              | N               | 30      | 30       | 30      | 30         | 30         | 30         |
| Management                                                   | Correlation     | -.346   | .321     | -.306   | -.149      | 1          | .202       |
|                                                              | Sig. (2-tailed) | .061    | .084     | .101    | .433       |            | .285       |
|                                                              | N               | 30      | 30       | 30      | 30         | 30         | 30         |
| Technology                                                   | Correlation     | .366*   | .534**   | .281    | .538**     | .202       | 1          |
|                                                              | Sig. (2-tailed) | .047    | .002     | .133    | .002       | .285       |            |
|                                                              | N               | 30      | 30       | 30      | 30         | 30         | 30         |
| **. Correlation is significant at the 0.01 level (2-tailed). |                 |         |          |         |            |            |            |
| *. Correlation is significant at the 0.05 level (2-tailed).  |                 |         |          |         |            |            |            |

## **4.4 Discussion**

The data collected from different data sources have revealed several interesting findings. Company A has been implementing their e-learning program for 8 years, several impressions were collected from the interviews with managers, trainers and regular learners (Employees). The data collected from the learning management system (LMS) and the support system allowed a deeper investigation for issues and difficulties faced the company in their implementation journey. In this section, a brief review of the research questions is firstly done, then results related to the research questions are discussed. Finally, the chapter is closed by presenting the Competency e-Learning Framework for corporates (CBeL) as a result of our discussion.

The data analysis process has revealed several factors that both supported and hindered a successful implementation of e-learning in the company. The findings are categorized into eight main sections (Preparation, Content, Management, Pedagogy, Technical, Evaluation, Support and Optimization). Next, each one of the findings categories are discussed:

### **4.4.1 Preparation**

This first section discusses findings of corporates prerequisite for having a successful e-learning implementation over a competency based approaches (CBeL). The implementation of CBeL can be complex and time-consuming process. Introducing e-learning as a professional training tool requires the organization strategic support and should be part of the corporate HR

strategic planning. Survey respondents have positively agreed that organization top management support for e-learning is a crucial factor that would highly boost or diminish the success of the e-learning implementation. They stressed the importance of having a dedicated team to manage this dynamic process and was considered one important factor that would have a global effect on this process.

On the other hand, several managers have mentioned that getting top management support and promoting the program internally would play an important role in speeding up the implementation process and reduces the resistance.

This comes aligned with (Marshal and Mitchell, 2002) who also emphasized on the importance of having a clear organization vision and strategy for driving the e-learning planning process.

Corporates capability to implement a successful e-learning program is highly connected to its maturity and more specifically the maturity of its HR department. Integrating HR and e-learning assumes good deal of preparation on the Human resources side. In order to achieve a good integration of e-learning with a competency based framework, organization must have at least reached to maturity level where the corporate competency framework and the business processes are well defined and documented.

In step to investigate further, the correlations between the preparation practices (P1-P4) and different implementation practices were analyzed (See table 4.17). The results have shown that many of the implementation practices are strongly correlated with different e-learning implementation practices. This gives another reason to emphasize on the importance of having a preparation step before getting into any implementation activities. In literature, several corporate maturity frameworks and models were suggested, most of these frameworks suggests different levels of organization maturity that reflects the complexity and certain view of organization growth and evolution. These frameworks and models have one thing in common: they all confirmed that organization maturity plays an important role in predicting its performance and drawing the road towards its development and improvement (Curtis et.al, 2009; Haney, 2002). These studies come aligned with our research finding that: *Certain level of corporate maturity and serious planning is crucial for a good e-learning implementation.*

Throughout the research, it was observed that e-learning implementation is far from just deploying an LMS and discretely publishing content. The amount of staff involved in the program from managers to trainers, internal and external vendors demonstrated that e-learning implementation is a highly engaged process that requires explicit plans and continuous monitoring and improvement. These plans lived side by side with the internal organization strategies and policies. Company A's e-learning program has shifted in parallel along with the organization business

objectives. The interviewees testimonies along with the LMS logs describe several changes in HR manager's strategies during the program timespan, these shifts in strategy have affected both the focus and magnitude of the delivered e-learning content. These observations come to support our finding about the *importance of corporate internal managerial and strategic support on the success of the CBeL process.*

#### **4.4.2 Content related factors**

In this section, content related factors which has an effect on the experience of CBeL implementation are discussed. The interviews held with users revealed that learners have increasingly preferred the interactive contents over rigid textual contents. Learners have described some content as boring as it lacked interactivity. Moreover, the trainers have encouraged the production of more interactive content to increase learner motivation and increase the retention time. The importance of training material interactivity was mentioned in several previous studies, Zhang et al. (2006) have studied the effect of interactive content on learners, it was found that embedding interactive videos have increased both learner performance and satisfaction comparing to non-interactive training contents. Content gamification enables learners to have personalized learning, in sense that each learner will have his own unique experience and still achieve same learning objectives (Kapp, 2016; Muntean, 2011; Pavlus, 2010). Gamification was also described to improve the feeling of ownership and purpose when engaging in learning tasks and thus improving the learner motivation. The study findings come to confirm that *gamification and*

*content interactivity is still a preference for e-learning content designed for corporate learners.* This comes aligned with results of other researchers discussed the topic in both the educational and corporate learning contexts.

### *Motivation and engagement*

Employees motivation was raised several times during interviews, Trainers and managers have highlighted a big challenge in finding ways for keeping employees motivated. In spite of these efforts, the the archival records statistics in Figure 4.2 have shown a degradation in learner's motivation over 27-month period. Several factors could affect the employee's motivation in using the organization's e-learning system, one reason could be lack of interactivity as described by participants, further investigation is required to collect more on this issue, this unfortunately was out of the scope of this study.

### *Content standardization*

Content standardization was also reported by managers and instructional designers as an annoying issue that disturbed content sharing and utilization.

In an international company with multi-language speaking employees -as in our case- the process of managing e-learning content is considered a challenging process, having content authored, distributed and maintained required long term planning and technical expertise.

The interviews with the technical employees has shed the light over an issue related to heterogeneous methods and technologies used in developing content. In spite the fact that more than 90% of designed courses was packaged as SCORM, it was not possible to integrate industry specific metadata or related company competencies in these packages, this was one barrier to content sharing and evaluation.

Researchers have discussed *content standardization* as an important prerequisite for content sharing (Bamidis, 2009). Although, there is very little research that integrates the industry specific metadata integration within e-learning content. The IMS Global Learning Consortium have published the Reusable Definition of Competency and Educational Objective (RDCEO). The RDCEO model is designed for describing, referencing, and exchanging definitions of competencies, primarily in the context of online and distributed learning (Ims, 2002). Despite the fact that this standard was proposed in 2002, few authoring tools are adopting its implementation, making it less visible even for corporates.

#### **4.4.3 Pedagogical factors**

As a result of the thematic analysis performed, couple of important pedagogical factors have been reported, the first is related to the *diversity of learner capabilities*, some employees found certain training materials hard, where others found it easy, this is due to the fact that employees are mainly coming from varying backgrounds, designing the course to be as

simple as possible and providing extra references for intermediate and advanced users was an observed strategy throughout the provided courses.

Published online courses were also observed to *embed a preliminary assessment* quiz Along with feedback from employees on course this formed a good overall feedback for the training course efficiency. These pedagogical factors are highly interrelated with both content and evaluation factors which is explained in the next section.

#### **4.4.4 Evaluation**

The data collected from survey questions (E1-E6) emphasized the need for a better evaluation process on several levels: Training performance, individual performance, and overall business performance. Interviews with managers have emphasized on the need for better overview about the overall learning progress.

The LMS offered the trainers and managers vast tools for generating course and usage reports allowing activity progress tracking. On the other hand, managers and trainer interviews have revealed that there is a lack global learning progress overview on *multiple organization levels* that reduced the efficiency of overall program planning. Also, trainers have described difficulties on mapping organization performance to the training courses given. The lack of performance measures on the published courses made some managers feel that the training didn't contribute to the business performance in spite of the budget allocated. It was clear that there was a

gap in performance evaluation on business level which the organization tried to solve by developing in-house mini solutions.

Researchers have realized this issue in the past, Xini and Petropoulos (2004) for example, proposed theoretical tools for supporting and tracking personal competencies facilitating the capture of individual and informal knowledge, the tool was composed of four main blocks used in evaluation process: learner profile, required profile, explicate evaluation and learning behavior patterns. Also (Loos et al., 2007) have proposed a theoretical model that map competencies to business process.

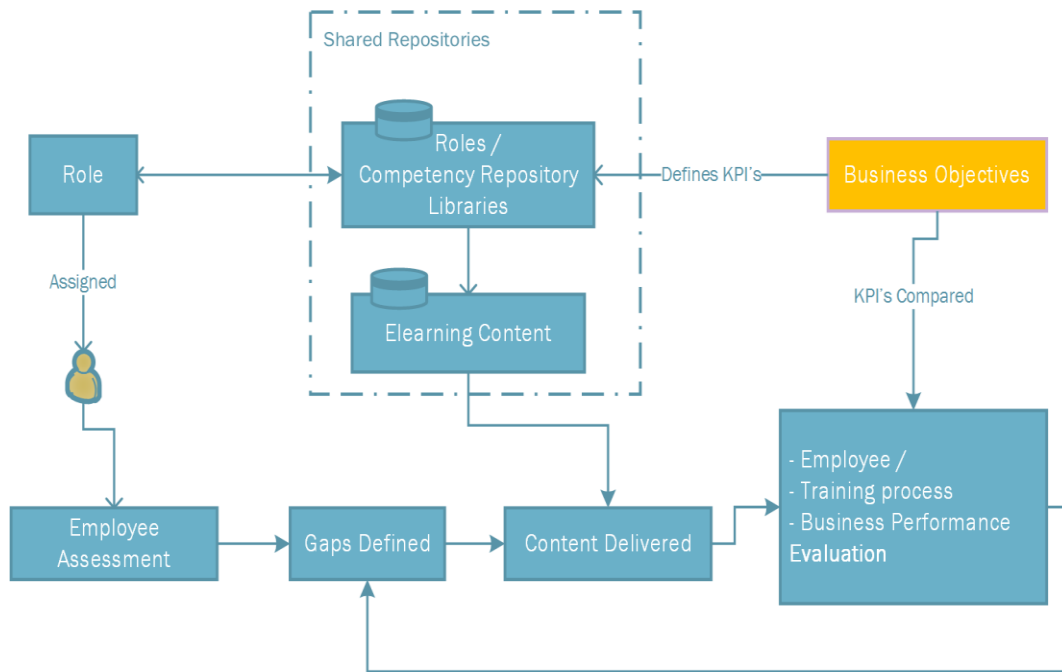
Performing personal competency evaluation in big organizations is not a trivial process. For example, reviewing the competency model for “Key Account Manager” role for Company A, the role had at least 76 different competencies describing different aspects of the account manager job, tracking these competencies manually on personal level for thousands of employees is an impossible job. An automated evaluation process is becoming very important.

On the other hand, accurately evaluating e-learning training courses was also raised as a difficulty in for a CBeL implementation. In the literature, there have been several models which were designed to assess corporate trainings, the most prevalent and frequently used models are: Experimental and quasi-experimental design (Shadish et al,2002), 4 levels of training (Donald, 1998), ROI Methodology (Jack, 1997), and Learning impact models (Josh, 2009). The aim of these models is to find the impact of the

training program on business and individual, in other words, we would need to answer the question: did the given course or training material cause performance improvement? Determining the causation reliably is not easy, but it's important for the course evaluation process.

Performing the analysis for regular training programs can take a lot of effort and can be expensive. Moreover, applying experimental design model on evaluating the training effect involves multiple training groups and large number of samples per each evaluated training course (Shadish, 2002). This process might not be efficient for low profile courses and possibly time consuming and expensive for high profile ones.

Luckily, e-learning courses could be coupled with external tools that automate the possibility of the evaluation process. This could simplify the process a lot and allow getting fast results on the fly. In order to facilitate this process, preliminary-assessment for learner should take place before and after the training to measure the training impact, also individual KPI's should be compared in order to evaluate the actual performance change.



**Figure 4.3:** CBeL Evaluation Model

Figure 4.3 shows the schematic for the CBeL evaluation process. The figure draws down the relation between different CBeL evaluation components. Starting from top level business objectives, Business KPI's are derived to form the inputs for both Competency models and the designed training content. The KPI's are then used to evaluate the actual business performance against the required organization KPI standards. Shared repositories (Libraries) of both competency models and e-learning content are important element of the evaluation process, they represent the data (knowledge) bank driving the training and the evaluation standards. The need for sharing both: e-Learning content and Competency models have been concluded by several researchers. Ostyn (2006) have proposed the reusable competency definition (RCD), realizing the need for sharing competency data in a unified repository. Also, the need for e-learning content sharing was translated by the born of the SCORM and other AICC

standards discussed earlier in Chapter 2. A common standard that combines both would increase the interoperability and improve the e-Learning content sharing capabilities.

When employee is assigned a role, corresponding competencies are automatically attached, a preliminary assessment is then required in order to calculate the employee knowledge gaps. Next, the gaps are covered by delivering the suitable employee with potential training materials/resources on demand. Once the training is complete, feedback about training itself is collected. The performance evaluation for both employee and business is performed against the business KPI's derived from the business objectives. Finally, this loop closes by defining the remaining gaps for a new training cycle.

#### **4.4.5 Technology related factors**

In this section, we discuss the technical findings that disturbed the implementation of e-learning for Company A. Interviews with the technical staff have revealed a continuous need to upgrade the training content to meet the advances in web and smart phone technologies. The speed at which the current web technologies evolving have made the cost of e-learning content goes higher than expected. It was clear that over eight years' time span several different breakthrough web technologies were introduced, this includes for example CSS3, HTML5, and other responsive web technologies. The technical staff have found themselves under pressure to get the current content upgraded in order to meet the new

demands for using smart phones and other mobile technologies. This required extra time and budget way more than what was initially planned.

Add to that, there was a heterogeneity in the content delivered. The fact that content was coming from external vendors and internal content authors, have dramatically increased the complexity of the content upgrade process. Fixing a standard was required. On the other hand, the company was achieving a remarkable high level of service availability and technical support response time over three-year timespan described by their infrastructure and helpdesk reports. This added to the overall employee satisfaction of their e-learning program.

#### **4.4.6 Management related factors**

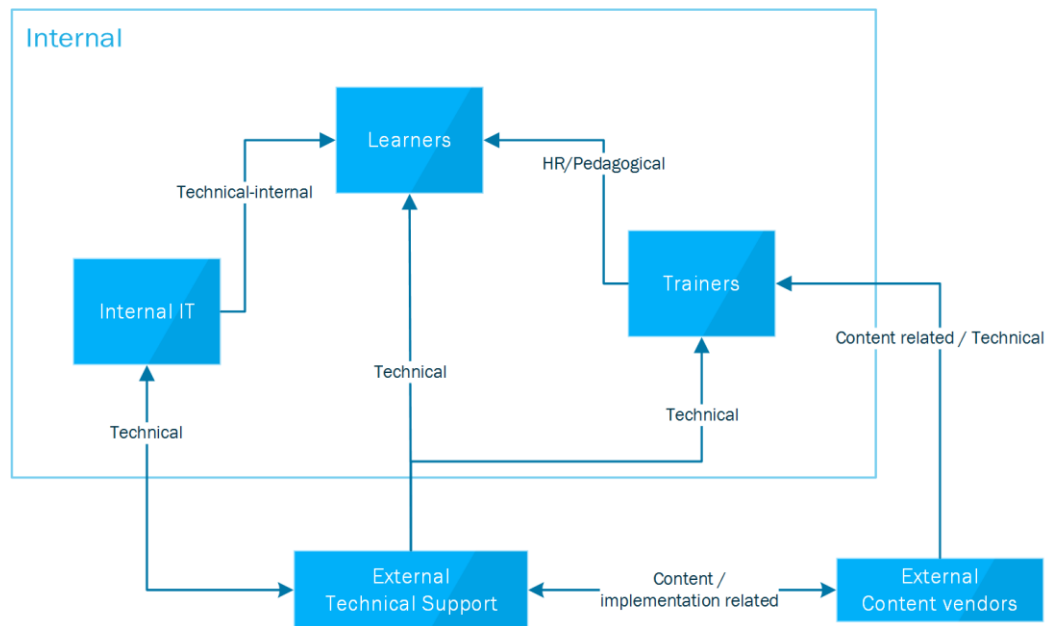
This section describes management factors that found to affect the e-learning implementation. Starting with the financial constraints, it was clear that in several occasions the e-learning program budget was extended. *The financial constraints* were sometimes not understood, was it problem in resource planning? Or due to hidden costs that were not anticipated in the first period of the program? It was not clear about the main reason for this constraint, further inputs would be possibly required to decide on these financial constraints reasons. On the other hand, researchers have identified a difficulty in calculating the full cost of an e-learning course (Sambrook, 2003), Many researches have mentioned the hidden costs and the difficulty in calculating the ROI for the e-learning programs (Bersin & Mallon, 2011) this comes also aligned with results obtained from this study.

*Internal e-learning promotion* was seen as an important factor for e-learning implementation success, several policies stated by Company A have helped speeding up the acceptance of e-learning across the company branches as observed through the LMS logs, new employees were starting their new jobs by taking an orientation online courses that got them to know about the e-learning portal and also helped them explore the different LMS features and available courses for future references. This was part of the corporate policy to get new comers to get used to the program. These practices have helped a lot in promoting for the program among employees and was reported to reduce resistance.

#### **4.4.7 e-Learning support**

The implemented e-learning support strategies was considered an important factor for e-learning implementation success, e-learning helpdesk system logs have shown a remarkable *short response times* have ranged from twenty minutes to two hours, depending on the inquiry type. This was found to leave positive effect of both learners and trainers.

On the other hand, Figure 4.4 shows the communication and support process interactions between the different e-learning program stakeholders. The figure represents the support process for one branch of the organization, the full picture of the support process incorporates several branches each having their own content, language, trainers and vendors. This indeed required the organization implement a solid support system with the help of external providers.



**Figure 4.4:** E-learning support process

*The support process was centralized*, in sense that all learners, trainers and vendors were given one support helpdesk (External), this opened one ticket per issue, then the helpdesk would dispatch and redirect the ticket to the right support queue (internal-IT, Trainers, external vendor, trainers) etc. One issue was reported in this process, the helpdesk would forward external related questions directly for content materials created externally, although the same process wasn't as smooth when the questions/issues were related to the internally created courses. In this case, the response times was dramatically increased. This is due to the fact that content author might not be available (possibly left the company or moved to different role) this left an issue on how to manage internally authored content in efficient manner which was never formally planned.

#### **4.5 Comparing opinions based on respondent roles, experience and country of origin.**

Analyzing the survey responses, it was interesting to check if there were any significant differences between the opinions of managers and trainers on the given survey practices.

Applying Kruskal Wallis u-test, and taking (role) as the grouping parameter, it resulted in having significant value (i.e.  $p > 0.05$ ) for all practices; it was evident that there is no significant difference between manager and trainer opinions in any of these practices. This commonality was somehow expected as the trainers and managers are coming from the same organization and share also the same department.

On the other hand, when comparing opinions about different CBeL dimensions based on *years of experience*, results were varying. Some practices had no significant differences where other practices have shown opinion differences as shown in Table (4.11). This opinion difference can be justified due to different experiences in realizing the importance (or unimportance) of specific practices or policies over time.

Opinion differences were also analyzed based on respondent country branch, results were not as expected as the previous two results, the Kruskal Wallis test showed varying agreement on different practices among different country branches. The researcher could not investigate further on the reason for the differences and left the topic for future research investigation.

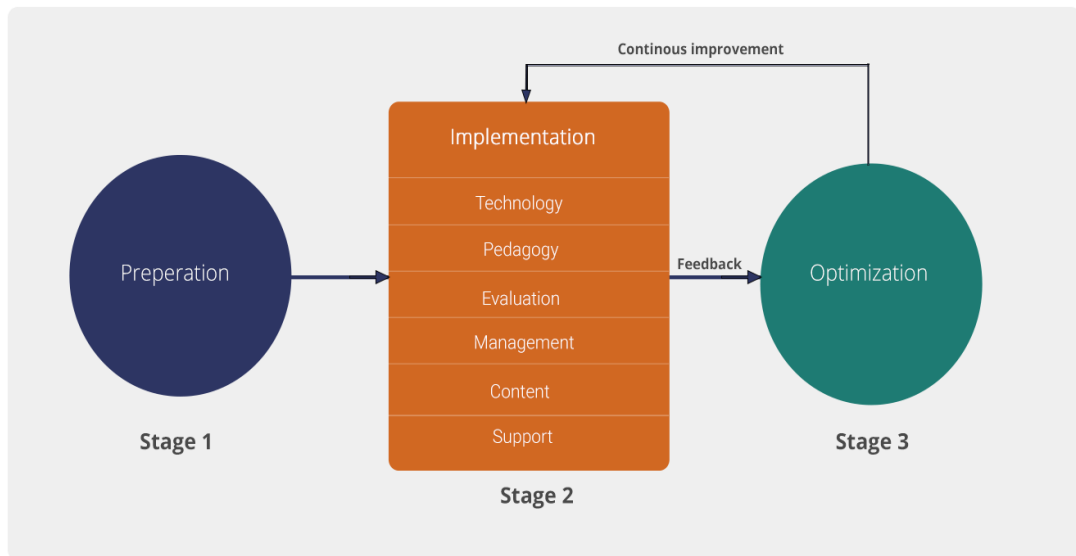
#### **4.6 Correlation between different CBeL dimensions**

The analysis of the survey has shown a strong relation between different dimensions of the CBeL process, this comes to emphasize on the importance of treating the implementation as a complete process rather than separate discrete training events. This result comes aligned with several researchers (Sun et al., 2008; Khan, 2008; Arth, 2011) who studied these dimensions in different contexts and reported their interoperability.

#### **4.7 Competency based e-Learning Framework**

On the light of previous discussions of this chapter we present the first version of our Framework for implementing competency based learning in corporations (CBeL Framework v1.0). The framework presents a set of practices for different stages of the CBeL process. It is intended to provide the corporates with guidance for planning and implement for their competency driven e-learning programs. The full Framework practices are shown in Appendix 1.

The framework describes three stages at which organization is required to go through when implementing a CBeL process: Preparation stage, Implementation stage and finally the Optimization stage. Figure 4.5 describes the relation between the different stages and their internal components. Each of the stages has a set of practices that corporate needs to take in consideration while going throw the CBeL process.

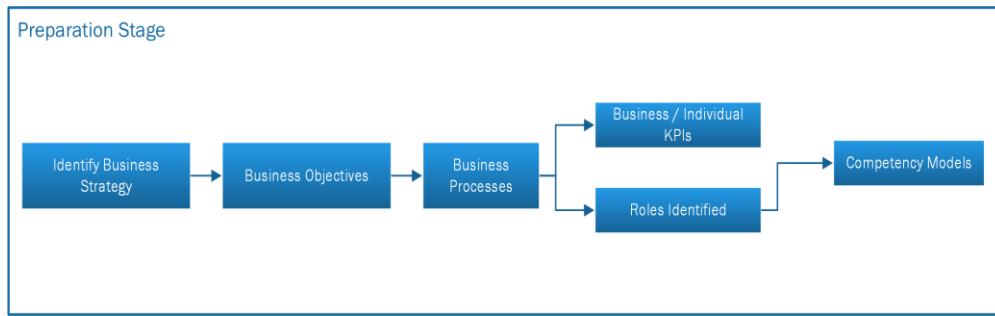


**Figure 4.5:** Competency based E-learning Framework (CBeL) v1.0

#### 4.7.1 Stage 1: Preparation

In this first stage, the set of practices that organization needs to adopt before the beginning of CBeL implementation are presented. Analyzing that organization possess a certain level of maturity is crucial for a successful implementation and maintenance of a CBeL process.

For Organization strategy, business process and competency framework are three main components that should be well defined prior the implementation of a competency based e-learning system. Figure 4.6 shows the relation of these three components.



**Figure 4.6:** CBeL Framework Preparation stage

The preparation stage starts by making sure the organization has a clear strategy that allows the derivation of clear business objectives.

Once the objectives are defined, derivation business processes become more systematic. At this stage business and individual KPI's should be then identified. KPI's identification will serve as the main inputs for the evaluation component of the implementation stage.

Next, the organization roles and competencies are identified based on skills required to achieve each of the organization processes. Defining the competency models are considered crucial for a solid implementation of CBeL.

#### 4.7.2 Stage 2: Implementation

The implementation stage of the CBeL framework requires a close case about six different aspects of e-learning: (Pedagogy, Support, Technology, Management, Content and Evaluation). In the CBeL we would like to call them “Dimensions” each dimension represents a group of detailed practices that insures a better e-learning implementation.

### 4.7.3 Stage 3: Optimization

Finally, the optimization process reflects the feedback factor of the framework, this process requires continuous monitoring and evaluation periodically, this is due to the fact that organization strategy is dynamic by nature, changes to business objectives is by default reflected to the type, and standard level of the required standards and thus the related training materials.

## 4.8 Comparing eMM, people-CMM and CBeL Frameworks

In this section, we compare the CBeL Framework with other literature related frameworks which studied both e-learning and competency based approaches. Table 4.18 shows six different criteria that used to compare these frameworks: purpose, inspiration, levels, topics discussed related, e-Learning integration and finally the target audience.

**Table 4.18 eMM, people-CMM, CBeL Frameworks comparison**

| Framework name          | eMM                               | people-CMM                                      | CBeL                                                                           |
|-------------------------|-----------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Purpose</b>          | Assess e-Learning maturity        | Assess Organization HR maturity                 | Provide guidance for a Competency based eLearning implementation in corporates |
| <b>Inspired by</b>      | CMM, SPICE                        | CMM                                             | CMM, eMM, people-CMM                                                           |
| <b>Levels</b>           | 5 – e-learning process categories | 22 Human capital process categories.            | 6 – CBeL Dimensions 3 stages.                                                  |
| <b>Discussed topics</b> | e-learning maturity               | Corporate maturity, competency based approaches | e-learning + competency based approaches                                       |
| <b>e-Learning</b>       | Yes                               | No                                              | Yes                                                                            |
| <b>Targeted for</b>     | Education                         | Corporates                                      | Corporates                                                                     |

The purpose of the eMM framework is to assess the organization capability in a e-learning processes. The main idea of the eMM is based on the famous Capability and Maturity Model (CMM) and Software Process Improvement and Capability dEtermination (SPICE). The framework describes five process categories which organizations need to consider in order to determine its capability in delivering e-learning. Each process of the eMM has five dimensions (Delivery, Planning, Definition, Management, Optimization) which decide the organization capability on that specific process. Its important to mention here that the eMM was developed in educational context, the complete concept of competency and competency framework did not exist, the main target audience was universities.

On the other hand, the people-CMM framework is an organization human resource maturity model, the people-CMM shares the same five dimensions of the eMM which both inherited from the revolutionary CMM framework. The framework has twenty-two human resource practice areas at which organization need to improve. Those areas are related to different aspects of human resources management including (staffing, workforce planning performance management ..etc ) please refer to the p-CMM (2009) for complete details. In contrast to the eMM the process categories of the p-CMM are not all evaluated for these five dimensions. Process categories does only belong to one dimension as its illustrated in Figure 4.7.

| Maturity levels         | Process Area Threads                          |                                                |                                                            |                                      |
|-------------------------|-----------------------------------------------|------------------------------------------------|------------------------------------------------------------|--------------------------------------|
|                         | Developing individual capability              | Building workgroups & culture                  | Motivating & managing performance                          | Shaping the workforce                |
| <b>5</b><br>Optimizing  | Continuous Capability Improvement             |                                                | Organizational Performance Alignment                       | Continuous Workforce Innovation      |
| <b>4</b><br>Predictable | Competency Based Assets<br>Mentoring          | Competency Integration<br>Empowered Workgroups | Quantitative Performance Management                        | Organizational Capability Management |
| <b>3</b><br>Defined     | Competency Development<br>Competency Analysis | Workgroup Development<br>Participatory Culture | Competency Based Practices<br>Career Development           | Workforce Planning                   |
| <b>2</b><br>Managed     | Training and Development                      | Communication & Coordination                   | Compensation<br>Performance Management<br>Work Environment | Staffing                             |

**Figure 4.7:** Process threads in the People CMM, people-CMM (2009).

The CBeL framework is built on ideas from both frameworks, several e-learning process categories of eMM match of what is called dimension in the CBeL work. Moreover, the practices under each of these dimensions are inspired from both the eMM and people- CMM. The CBeL follows the leveling concept of the people-CMM in sense that practices do not have any evaluation levels (or what's called a dimension in the eMM framework). This is because the CBeL framework is designed to provide guidance – check list- for a Competency based eLearning implementation in a company rather than assessing a maturity or capability.

## **4.9 Summary**

In this chapter results of the study were analyzed for both phases. For Phase I, (Qualitative) thematic analysis was conducted, resulting in six main problem themes that faces the implementation of a CBeL process (Content related, Management related, Support Issues, Evaluation, Technology related, and Pedagogical issues). The chapter then discussed the results of survey tool that was developed and distributed to the managers and trainers of e-learning program. Correlation between the different dimensions was calculated. Also opinion differences between the managers and trainers was tested. The chapter discussed the results and the CBeL framework was introduced and compared to other frameworks discussing the same topic.

## **Chapter 5**

### **Conclusions and Recommendations**

In this chapter, we draw the conclusion of this research study, we start the chapter by presenting an overview about the work performed, then we list our conclusions based on the discussion of the previous chapter, also, recommendation and study limitations and future study recommendations are presented.

#### **5.1 Overview of the work performed**

In this study, the implementation of a competency based e-learning (CBeL) was investigated, factors that affects its success were explored, a single case study was performed, our approach was to use both qualitative and quantitative methodologies to collect and investigate possible difficulties that may hinder a successful implementation of this process.

The selected case included an international company “Company A” which used Competency based approaches and have implemented e-learning for several years. Semi-structured Interviews with e-learning program key managers and trainers were held, inputs about difficulties and experiences were collected. Other resources were also used to support the notes and answers of the respondents including: Learning Management System (LMS) records, courses data, access logs and usage statistics. This process was marked as (Phase I).

On the light of the collected data in Phase I combined with extensive literature review, a survey tool was prepared. The survey was distributed to thirty respondents and trainers in different branches worldwide. The survey asked participants to give feedback about a set of competency / e-learning practices based on their perception and previous experiences.

Finally, interviews data and survey results were analyzed. Different themes have emerged as a result of the interviews thematic analysis, those themes were then compared to practices results from Phase II, survey and conclusions were drawn resulting from our first version of the Competency based e-Learning Framework as we refer to it by CBeL Framework v1.0.

## **5.2 Conclusions**

Several points have been concluded from this study resulting in the CBeL framework discussed in the previous chapter, next we go through each of the main points linking them to their corresponding discussion section:

- Based on the research findings, it can be concluded that there are three stages a company should consider when implementing competency based e-learning (CBeL) program, these stages are: Preparation stage, Implementation stage and the Optimization stage.
- Study shows that CBeL is a very dynamic process, it emerges from organization strategies and evolves as those strategies and objectives shifts over the time. It's important to realize this nature and be prepared

to assign explicit resources to handle the process life cycle. (Section 4.4.1)

- The study shows that in the preparation stage, it is required to make sure that the corporate has a well-defined and documented business processes. This is considered a crucial step for later stages and specially during the implementation stage. (Section 4.4.1)
- The competency based approaches have long history in driving the human resources professional development strategies, building and maintaining the competency models is a time-consuming task. Luckily, integrating these models with the organization e-learning process would add a great value to the whole e-learning program. In a CBeL program, Competencies can drive the e-content creation, assignment and evaluation on all organizational levels. The study shows that having a rigid competency framework is required to complete the implementation of the CBeL process. (Section 4.4.1)
- Six dimensions were found to affect the CBeL program implementation in corporations: Content, Pedagogy, Technology, Management, Support and Evaluation. These dimensions are highly correlated and require continuous review, evaluation and optimization overtime. (Sections 4.4.2 – 4.4.7 , 4.5)

- In a CBeL implementation stage, the content dimension describes training material factors which affect the process, the study concluded that content standardization, content sharing, linking content to business process and content interactivity are all common factors which affect the efficiency of CBeL process. (Section 4.4.2)
- The Pedagogy dimension describes the pedagogical factors which would affect a CBeL implementation, *preliminary assessments* were found to be important practice which helps in identifying the learning gaps and thus deciding which e-learning content should be delivered. Also, *diversity of learner capabilities is an issue on* which an integration of CBeL would solve. Linking the training content to business processes and objectives would highly increase the traceability (causal) and improve the process efficiency. (Section 4.4.3)
- The study has uncovered two support implementation areas: HR and Technical support, it was also clear that in a big organization the support can grow to very complex structures including several internal and external stakeholders. Faster support means more end user satisfaction, the study confirmed that this is also a valid sentence when implementing a CBeL process. (Section 4.4.7)
- The fact that competency based approaches and e-learning highly intersects in the evaluation dimension; makes it an important point of focus in this study. Three main evaluation areas were concluded to be most critical for a CBeL implementation: Personal Evaluation, Training

evaluation and finally the business performance evaluation. The evaluation should occur on different organizational levels and forms as an important input for the optimization stage. (Section 4.4.4)

- The technology dimension was found to an important dimension in the CBeL process, the study emphasized on the importance of infrastructure reliability and standardization in improving the efficiency of CBeL implementation. (Section 4.4.5)
- Management dimension describes a critical managerial factor which would highly impact the implementation process, the study confirmed that hidden costs of e-learning implementation can seriously affect the implementation efficiency. Also explicit planning, promoting for the program internally and assigning explicit team for planning and driving the CBeL program is a must for a successful implementation. (Section 4.4.6)
- The last stage of the CBeL process is the Optimization stage. In this stage, feedback about the e-learning implementation is evaluated and compared to the current organizations strategies and objectives. Corrective measures are then taken in order to continuously optimize this process. (Section 4.4.4)

### 5.3 Recommendations

Based on the results of this study, several recommendations can be made:

- The CBeL is a dynamic process, it's important for the implementing company to realize this fact and assign explicit resources to manage this complex process.
- Having CBeL prerequisites checked first is highly recommended, otherwise company might end up implementing discrete LMS with training courses that their efficiency is hard to trace.
- The CBeL dimensions are very correlated, having the corporate focus on dimensions and ignoring others might not lead to the optimal implementation.
- Its recommended to have solid standards for content authoring processes, these can be distributed to internal and external vendors. Having these standards would save a lot of time in future maintenance and would upgrade and save resources.
- The Study recommends having a solid support strategy when implementing CBeL, support areas include: technical and HR support. Keeping an eye on the support response time would highly affect learner's satisfaction and reduces frustration.

- Having training related performance indicators monitored on different levels would highly impact the CBeL process and increases its efficiency. Integrating a software to handle this task would simplify the process and lead to better decision-making practices.
- The optimization stage is a very important stage as it guarantees that the CBeL does not get outdated over the time, it is highly recommended to have the optimization stage as a part of the corporate strategic plan and to execute it as frequent as the organization objective changes.

#### **5.4 Study Limitations**

Although this study revealed a number of significant insights and contributions, given the nature of the exploratory case study research work presented, this research has a number of limitations:

- In spite of the vast amounts of data collected in this study, some implementation factors might not be fully covered, for example, cultural aspects and different managerial philosophies in different company branches were out of the scope of this study.
- Also, the resulting CBeL framework might better suit mature organizations rather than the SME's, as it assumes the organizations have a certain level of maturity, considerably higher resources that is required to run such implementation process.

- The study might be criticized for its weak generalizability as it was dependent only on a single case study, the research has used triangulation, and it also incorporated several country branches in order to increase the diversity and thus improves its generalizability. Also, several data sources were used including: interviews, surveys, LMS statistical data and log files. Plus, experts' opinion on the approach and survey data were collected. These factors have contributed positively to study generalizability.

### **5.5 Future research recommendations**

There are plenty of research recommendations resulted from this research study, these include:

- To Study the possibility of developing Industry based competency framework for different industries in Palestine.
- Further studies might also be considered to investigate the “Evaluation” dimension of the e-learning competency based approach.

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# Appendix 1

## 1-Phase II Survey

E-learning & Competency Based Learning Integration (2017)

This survey aims to explore the optimal process for implementing competency based e-learning system in corporates. Please answer the survey questions based on your perception .

Thank you in advance!

There are 55 questions in this survey

### General Information

[] Organization name \*

Please write your answer here:

[] Position title \*

Please write your answer here:

[] Years of experience \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ 3 - 5 Years
- ☐ 6 - 10 Years
- ☐ More than 10 years

[] Country \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ France
- ☐ Germany ☐ Netherland ☐ Norway
- ☐ UK
- ☐ United States ☐ Palestine
- ☐ Other

[] Company size (Number of Employees) \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ 1 - 250
- ☐ 250 - 500
- ☐ Greater than 500

### Preparation Stage

This questions group explores the **preparation** practices that organization should do before implementing an e-learning system that is based on organization competency framework.

[] P1. Organization should have a documented business process objectives and defined performance indicators \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree
- ☐ Agree
- ☐ Undecided ☐ Disagree
- ☐ Strongly Disagree

[]P2. Organization should have an up to date competency framework in order to drive learning activities \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]P3. Institutional learning and strategy should explicitly address competency driven e-learning \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided Disagree  
☐ Strongly Disagree

[]P4. A Team should be formed to manage both the implementation and the optimization processes \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

### Implementation Stage / Content

This questions group explores the **implementation process** of Competency based e-learning system, the implementation has 4 sub-categories and this category explores the **(content)** practices.

[]D1. Training staff should be provided with design and development support when engaging in e-learning. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D2. Course development, design and delivery should be guided by e-learning procedures and standards. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D3. An explicit plan should link e-learning technology, pedagogy and content used in courses. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree ☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D4. Courses should be designed with disabled employees needs taken in considerations. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D5. All elements of the physical e-learning infrastructure should be reliable, robust and sufficient. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D6. All elements of the physical e-learning infrastructure needs to be integrated using defined standards. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D7. E-learning resources should be designed and managed to maximise reuse and resource sharing. \*

Choose one of the following answers

Please choose **only one** of the following:

- ☐ Strongly Agree ☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D8. E-learning resources designed should be explicitly linked to the corresponding business competencies. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D9. Learner profile competencies levels should be updated periodically manually or by an automatic trigger on training material accomplishment \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]D10. Designed courses and training materials should support as much devices and operating systems as possible (Mobile ,PC, etc) . \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

### Implementation Stage / Pedagogy

This questions group explores the **implementation process** of Competency based e-learning system, the implementation has 4 sub-categories and this category explores the **(Pedagogy)** practices.

[]L1. Learning objectives derived from business processes objectives should guide the design and implementation of courses. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]L2. Employees need to be provided with mechanisms for interaction with teaching staff and other Employees.

\*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]L3. Employees need to be provided with e-learning skill development. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]L4. Employees need to be provided with expected staff response times to employee communications. \*

Choose one of the following answers Please choose **only one** of the following:

[]L5. Employees should receive feedback on their performance within courses. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]L6. Learning designs and activities should actively engage Employees \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]L7. Assessment should be designed to progressively build learner competence. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]L8. Learning plans should be subject to specified timetables and deadlines. \*

Choose one of the following answers Please choose **only one** of the following:

[]L9. Courses design needs to support diverse learning styles and learner capabilities.

\*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]L10. Preliminary assessments should be performed to reveal possible competency gaps and form the basis for learning plans. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

### Implementation Stage / Support

This questions group explores the **implementation process** of Competency based e-learning system, the implementation has 4 sub-categories and this category explores the **(Support)** practices.

[]S1. Employees need to be provided with technical assistance when engaging in e-learning. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]S2. Employees need to be provided with library facilities when engaging in e-learning. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]S3. Employees enquiries, questions and complaints should be collected and managed formally. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]S4. Employees need to be provided with personal and learning support services when engaging in e-learning.

\*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]S5. Training staff has to be provided with e-learning pedagogical support and professional development. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree

☐ Strongly Disagree

[]S6. Local content authors staff should be provided with technical support in using digital information created by Employees. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]S7. Employees should be provided with periodic HR support on their current and future learning paths. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree

- ☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[ ]S8. Content authors need to be provided with HR support to ensure courses developed fits the required competency levels. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

### Implementation Stage / Evaluation

This questions group explores the **implementation process** of Competency based e-learning system, the implementation has 4 sub-categories and this category explores the **(Evaluation)** practices.

[ ]E1. Employees should be able to provide regular feedback on the quality and effectiveness of their e- learning experience. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[ ]E2. Training staff should be able to provide regular feedback on quality and effectiveness of their e-learning experience. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[ ]E3. Regular reviews of the e-learning aspects of courses need to conducted. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[ ]E4. Employees should be able to provide feedback about their experience on the quality of content in improving their competencies. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[ ]E5. Mangers should be able to provide feedback about their experience on the quality of content in improving their fellowers competencies. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]E6. Measurements should be embeded within a training materials to determine the status and performance of Training and Development activities. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]E7. Employees should be provided with mechanism to have an overview about their current competency level and expected standard \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

### Implementation Stage / Management

This questions group explores the **implementation process** of Competency based e-learning system, the implementation has 4 sub-categories and this category explores the **(Management)** practices.

[]O1. Formal criteria should guide the allocation of resources for e-learning design, development and delivery. \*

[]O2. Institutional learning and training policy and strategy need to explicitly address e-learning. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]O3. E-learning technology decisions has to be guided by an explicit plan.\*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]O4. Digital information use has to be guided by an institutional information integrity plan. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]O5. E-learning initiatives should be guided by explicit development plans.\*

### Optimization Stage

This questions group explores the **Optimization process** (Feedback) of Competency based e-learning system.

[]N1. Business Objectives and Performance Indicators are to be regularly reviewed and necessary changes to corresponding competencies should be reflected . \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]N2. Business Objectives and Performance Indicators are to be regularly reviewed and necessary changes to corresponding Training material and should be reflected

. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]N3. New e-learning technologies and tools that would enhance employee learning should be identified regularly and action should be taken to provide them .

\*

Choose one of the following answers

Please choose **only one** of the following:

- ☐ Strongly Agree ☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]N4. Remarkable improvement in competencies should be automatically notified and possibly rewarded. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]N5. Measurements embedded in content should be aggregated and data should be reviewed on both unit and organization levels. \*

Choose one of the following answers Please choose **only one** of the following:

- ☐ Strongly Agree  
☐ Agree  
☐ Undecided ☐ Disagree  
☐ Strongly Disagree

[]Would you like to provide us with any other comments ?

Please write your answer here:

Thank you for your time filling our survey!

Submit your survey.

Thank you for completing this survey.

## 2- Letter for study participation (and sample response)

### Survey - Participation invitation letter

Greetings [REDACTED]

Hope you are doing well, I've been recently working on a study for integrating e-learning with corporate's competency framework, the study aims to highlight the optimal practices corporate should take to implement and improve online training, more specific am exploring the points of integration between the HR systems and the e-Learning systems.

As you know I've been extensively working around this topic in the last few years, also in [REDACTED] there has been great focus on the topic in first years of the program implementation, would you please share your opinion on the topic by answering questions in the survey below, your opinion is very valuable to us!

Also, is there a possibility to invite other HR Managers to participate in this survey? I would like to share the results with the new [REDACTED] team later this year when the study is complete, this will help identifying the hotspots where more care needs to be taken (from HR managers point of view) when planning any improvements to the [REDACTED] system.

No need to remind that any data collected will remain confidential and will be anonymized when presented.

Br  
Wafa Adham

 [rebeccah@hr-partner.com](mailto:rebeccah@hr-partner.com)  
to Wafa A.

Hi Wafa,

I just finished the survey.  
I will also forward it to some of my HR colleagues.

Best regards,  
R [REDACTED]

[REDACTED] | Junior HR Business Partner - Partner Functions | [REDACTED] GmbH  
[REDACTED] am Neuenburgerpark 11, 91062 Erlangen, Deutschland  
Telephone: + [REDACTED] | Mobil [REDACTED]  
Email: [rebeccah@hr-partner.com](mailto:rebeccah@hr-partner.com)

### 3- List of Experts

|                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p><b>Dr. Ayham Jaaron</b><br/> Expert in Institutional development and Strategic Planning consultant.<br/> Associate Professor of Industrial Engineering. Industrial Engineering Department, An-Najah National University, Palestine, April 2018-Present.<br/> Member of the Institute of Industrial Engineers (IIE) Georgia, USA</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|    | <p><b>Mr. Valery Fremaux</b><br/> French Digital Learning expert mixing a long teaching experience in Higher Education Software Engineering courses and an industry engineering experience. He has an Engineering degree in Electronics and Software computing in the ENSEA School in Cergy (France), and later has acquired a master degree in Sociology and Ethnomethodology at Paris 8 University (St Denis).</p> <p>In the last 14 years, Mr. Valery is probably one of the most active external contributor of the Moodle LMS owning around 10% of the world-wide contributions. He provides digital learning services and innovation advanced developments for the French National Education system. Mr. Valery provides and manages digital services for more than 500.000 users in secondary education across France, he also provides consulting services for higher education, corporate training and professional development programs.</p> |
|  | <p><b>Anja Schmitt AL Kabbout</b><br/> Change Consultant at AKTICON LLC<br/> Otto-Friedrich-Universität Bamberg<br/> A Specialties Growing the business through targeted competency development.</p> <p>Worked as a Global Learning &amp; Development Manager of Sales (Danone Medical Nutrition), Netherlands.<br/> Anja is currently the co-founder of Akticon LLC. Which Provides international e-learning and skill development services worldwide.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

#### 4- Normality test for survey answers

| Practice                                                                                                                                        | Kolmogorov-Smirnova |    |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----|------|
|                                                                                                                                                 | Statistic           | df | Sig. |
| P1. Organization should have a documented business process objectives and defined performance indicators                                        | 0.775               | 30 | 0    |
| P2. Organization should have an up to date competency framework in order to drive learning activities                                           | 0.637               | 30 | 0    |
| P3. Institutional learning and strategy should explicitly address competency driven e-learning                                                  | 0.755               | 30 | 0    |
| P4. A Team should be formed to manage both the implementation and the optimization processes                                                    | 0.652               | 30 | 0    |
| D1. Training staff should be provided with design and development support when engaging in e-learning.                                          | 0.638               | 30 | 0    |
| D2. Course development, design and delivery should be guided by e-learning procedures and standards.                                            | 0.404               | 30 | 0    |
| D3. An explicit plan should link e-learning technology, pedagogy and content used in courses.                                                   | 0.729               | 30 | 0    |
| D4. Courses should be designed with disabled employees needs taken in considerations.                                                           | 0.612               | 30 | 0    |
| D5. All elements of the physical e-learning infrastructure should be reliable, robust and sufficient.                                           | 0.717               | 30 | 0    |
| D6. All elements of the physical e-learning infrastructure need to be integrated using defined standards.                                       | 0.612               | 30 | 0    |
| D7. E-learning resources should be designed and managed to maximize reuse and resources sharing.                                                | 0.807               | 30 | 0    |
| D8. E-learning resources designed should be explicitly linked to the corresponding business competencies.                                       | 0.703               | 30 | 0    |
| D9. Learner profile competencies levels should be updated periodically manually or by an automatic trigger on training material accomplishment. | 0.838               | 30 | 0    |
| D10. Designed courses and training materials should support as much devices and operating systems as possible (Mobile, PC, etc) .               | 0.807               | 30 | 0    |
| L1. Learning objectives derived from business processes objectives should guide the design and implementation of courses.                       | 0.452               | 30 | 0    |
| L2. Employees need to be provided with mechanisms for interaction with teaching staff and other Employees.                                      | 0.554               | 30 | 0    |
| L3. Employees need to be provided with e-learning skill development.                                                                            | 0.811               | 30 | 0    |
| L4. Employees need to be provided with expected staff response times to employee communications.                                                | 0.586               | 30 | 0    |
| L5. Employees should receive feedback on their performance within courses.                                                                      | 0.785               | 30 | 0    |
| L6. Learning designs and activities should actively engage Employees.                                                                           | 0.717               | 30 | 0    |
| L7. Assessment should be designed to progressively build learner competence.                                                                    | 0.545               | 30 | 0    |
| L8. Learning plans should be subject to specified timetables and deadlines.                                                                     | 0.625               | 30 | 0    |
| L9. Courses design needs to support diverse learning styles and learner capabilities.                                                           | 0.612               | 30 | 0    |
| L10. Preliminary assessments should be performed to reveal possible competency gaps and form the basis for learning plans.                      | 0.729               | 30 | 0    |
| S1. Employees need to be provided with technical assistance when engaging in e-learning.                                                        | 0.772               | 30 | 0    |
| S2. Employees need to be provided with library facilities when engaging in e-learning.                                                          | 0.859               | 30 | 0    |
| S3. Employees enquiries, questions and complaints should be collected and managed formally.                                                     | 0.646               | 30 | 0    |
| S5. Training staff has to be provided with e-learning pedagogical support and professional development.                                         | 0.492               | 30 | 0    |
| S7. Employees should be provided with periodic HR support on their current and future learning paths.                                           | 0.612               | 30 | 0    |
| S8. Content authors need to be provided with HR support to ensure courses developed fits the required competency levels.                        | 0.68                | 30 | 0    |
| E1. Employees should be able to provide regular feedback on the quality and effectiveness of their e-learning experience.                       | 0.452               | 30 | 0    |
| E2. Training staff should be able to provide regular feedback on quality and effectiveness of their e-learning experience.                      | 0.347               | 30 | 0    |

|                                                                                                                                                               |       |    |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|---|
| E3. Regular reviews of the e-learning aspects of courses need to be conducted.                                                                                | 0.79  | 30 | 0 |
| E4. Employees should be able to provide feedback about their experience on the quality of content in improving their competencies.                            | 0.597 | 30 | 0 |
| E5. Managers should be able to provide feedback about their experience on the quality of content in improving their followers' competencies.                  | 0.844 | 30 | 0 |
| E6. Measurements should be embedded within training materials to determine the status and performance of Training and Development activities.                 | 0.701 | 30 | 0 |
| E7. Employees should be provided with a mechanism to have an overview about their current competency level and expected standard.                             | 0.492 | 30 | 0 |
| O1. Formal criteria should guide the allocation of resources for e-learning design, development and delivery.                                                 | 0.404 | 30 | 0 |
| O2. Institutional learning and training policy and strategy need to explicitly address e-learning.                                                            | 0.545 | 30 | 0 |
| O3. E-learning technology decisions have to be guided by an explicit plan.                                                                                    | 0.496 | 30 | 0 |
| O4. Digital information use has to be guided by an institutional information integrity plan.                                                                  | 0.616 | 30 | 0 |
| O5. E-learning initiatives should be guided by explicit development plans.                                                                                    | 0.824 | 30 | 0 |
| N1. Business Objectives and Performance Indicators are to be regularly reviewed and necessary changes to corresponding competencies should be reflected.      | 0.577 | 30 | 0 |
| N2. Business Objectives and Performance Indicators are to be regularly reviewed and necessary changes to corresponding Training material should be reflected. | 0.808 | 30 | 0 |
| N3. New e-learning technologies and tools that would enhance employee learning should be identified regularly and action should be taken to provide them.     | 0.71  | 30 | 0 |
| N4. Remarkable improvement in competencies should be automatically notified and possibly rewarded.                                                            | 0.772 | 30 | 0 |
| N5. Measurements embedded in content should be aggregated and data should be reviewed on both unit and organization levels.                                   | 0.586 | 30 | 0 |

## 5- Kruskal Wallis Test results for testing opinion differences among respondents based on their position, country and experience.

| Practice                                                                                                                                       | Position    | Country     | Experience  |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------------|
|                                                                                                                                                | Asymp. Sig. | Asymp. Sig. | Asymp. Sig. |
| P1. Organization should have a documented business process objectives and defined performance indicators                                       | 0.594       | 0.228       | 0.035       |
| P2. Organization should have an up to date competency framework in order to drive learning activities                                          | 1           | 0.001       | 0.004       |
| P3. Institutional learning and strategy should explicitly address competency driven e-learning                                                 | 0.585       | 0.779       | 0.013       |
| P4. A Team should be formed to manage both the implementation and the optimization processes                                                   | 0.694       | 0.037       | 0.002       |
| D1. Training staff should be provided with design and development support when engaging in e-learning.                                         | 0.281       | 0.026       | 0.007       |
| D2. Course development, design and delivery should be guided by e-learning procedures and standards.                                           | 0.291       | 0.448       | 0.001       |
| D3. An explicit plan should link e-learning technology, pedagogy and content used in courses.                                                  | 0.738       | 0.228       | 0.002       |
| D4. Courses should be designed with disabled employees needs taken in considerations.                                                          | 0.063       | 0.008       | 0.041       |
| D5. All elements of the physical e-learning infrastructure should be reliable, robust and sufficient.                                          | 0.364       | 0.049       | 0.002       |
| D6. All elements of the physical e-learning infrastructure needs to be integrated using defined standards.                                     | 0.71        | 0.022       | 0.166       |
| D7. E-learning resources should be designed and managed to maximize reuse and resource sharing.                                                | 0.175       | 0.865       | 0.119       |
| D8. E-learning resources designed should be explicitly linked to the corresponding business competencies.                                      | 0.278       | 0.05        | 0.035       |
| D9. Learner profile competencies levels should be updated periodically manually or by an automatic trigger on training material accomplishment | 0.111       | 0.171       | 0.006       |
| D10. Designed courses and training materials should support as much devices and operating systems as possible (Mobile ,PC, etc) .              | 0.627       | 0.062       | 0           |
| L1. Learning objectives derived from business processes objectives should guide the design and implementation of courses.                      | 0.63        | 0.524       | 0.802       |
| L2. Employees need to be provided with mechanisms for interaction with teaching staff and other Employees.                                     | 1           | 0.365       | 0.366       |
| L3. Employees need to be provided with e-learning skill development.                                                                           | 0.79        | 0.067       | 0.072       |
| L4. Employees need to be provided with expected staff response times to employee communications.                                               | 0.952       | 0.269       | 0.161       |
| L5. Employees should receive feedback on their performance within courses.                                                                     | 0.088       | 0.803       | 0.018       |
| L6. Learning designs and activities should actively engage Employees                                                                           | 0.11        | 0.461       | 0.394       |
| L7. Assessment should be designed to progressively build learner competence.                                                                   | 0.678       | 0.14        | 0.64        |
| L8. Learning plans should be subject to specified timetables and deadlines.                                                                    | 0.816       | 0.122       | 0.376       |
| L9. Courses design needs to support diverse learning styles and learner capabilities.                                                          | 0.71        | 0.022       | 0.166       |
| L10. Preliminary assessments should be performed to reveal possible competency gaps and form the basis for learning plans.                     | 0.1         | 0.037       | 0.004       |
| S1. Employees need to be provided with technical assistance when engaging in e-learning.                                                       | 0.14        | 0.004       | 0.059       |
| S2. Employees need to be provided with library facilities when engaging in e-learning.                                                         | 0.706       | 0.019       | 0.213       |
| S3. Employees enquiries, questions and complaints should be collected and managed formally.                                                    | 0.936       | 0.032       | 0.005       |
| S4. Employees need to be provided with personal and learning support services when engaging in e-learning.                                     | 1           | 1           | 1           |
| S5. Training staff has to be provided with e-learning pedagogical support and professional development.                                        | 0.369       | 0.119       | 0.007       |
| S6. Local content authors staff should be provided with technical support in using digital information created by Employees.                   | 1           | 1           | 1           |
| S7. Employees should be provided with periodic HR support on their current and future learning paths.                                          | 0.71        | 0.283       | 0.246       |

|                                                                                                                                                                    |       |       |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|
| S8. Content authors need to be provided with HR support to ensure courses developed fits the required competency levels.                                           | 0.163 | 0.166 | 0.072 |
| E1. Employees should be able to provide regular feedback on the quality and effectiveness of their e-learning experience.                                          | 0.148 | 0.303 | 0.036 |
| E2. Training staff should be able to provide regular feedback on quality and effectiveness of their e-learning experience.                                         | 0.55  | 0.017 | 0.128 |
| E3. Regular reviews of the e-learning aspects of courses need to conducted.                                                                                        | 0.185 | 0.167 | 0.003 |
| E4. Employees should be able to provide feedback about their experience on the quality of content in improving their competencies.                                 | 1     | 0.035 | 0.251 |
| E5. Mangers should be able to provide feedback about their experience on the quality of content in improving their followers competencies.                         | 0.371 | 0.04  | 0.001 |
| E6. Measurements should be embedded within a training materials to determine the status and performance of Training and Development activities.                    | 0.487 | 0.345 | 0.678 |
| E7. Employees should be provided with mechanism to have an overview about their current competency level and expected standard                                     | 0.369 | 0.203 | 0.016 |
| O1. Formal criteria should guide the allocation of resources for e-learning design, development and delivery.                                                      | 0.291 | 0.448 | 0.001 |
| O2. Institutional learning and training policy and strategy need to explicitly address e-learning.                                                                 | 0.677 | 0.585 | 0.305 |
| O3. E-learning technology decisions has to be guided by an explicit plan.                                                                                          | 0.325 | 0.401 | 0.823 |
| O4. Digital information use has to be guided by an institutional information integrity plan.                                                                       | 0.953 | 0.174 | 0.021 |
| O5. E-learning initiatives should be guided by explicit development plans.                                                                                         | 0.352 | 0.153 | 0.75  |
| N1. Business Objectives and Performance Indicators are to be regularly reviewed and necessary changes to corresponding competencies should be reflected .          | 0.695 | 0.12  | 0.043 |
| N2. Business Objectives and Performance Indicators are to be regularly reviewed and necessary changes to corresponding Training material and should be reflected . | 0.128 | 0.735 | 0.065 |
| N3. New e-learning technologies and tools that would enhance employee learning should be identified regularly and action should be taken to provide them .         | 0.868 | 0.007 | 0.004 |
| N4. Remarkable improvement in competencies should be automatically notified and possibly rewarded.                                                                 | 0.481 | 0.367 | 0.004 |
| N5. Measurements embedded in content should be aggregated and data should be reviewed on both unit and organization levels.                                        | 0.355 | 0.086 | 0.034 |

## 6- CBeL Framework for corporates v1.0

|                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Practice list                                                                                                                                                                   |
| Preparation                                                                                                                                                                     |
| FP1. Organization should have a clear strategy and well-defined business processes                                                                                              |
| FP2. Ensure having a solid competency framework describing the company roles and their related competencies.                                                                    |
| FP3. Ensure the company is prepared financially to implement e-learning as a dynamic process not as an event.                                                                   |
| FP4. Employees need to be provided with e-learning skill development.                                                                                                           |
| Implementation: Content                                                                                                                                                         |
| FC1. Course design should be driven by standard procedures for both internal and external content providers.                                                                    |
| FC2. Designed training resources need to promote for reuse and sharing among different organization levels.                                                                     |
| FC3. Designed resources should be explicitly linked to business processes under certain context.                                                                                |
| FC4. Content design should support interactivity and increase employee motivation                                                                                               |
| Implementation: Pedagogy                                                                                                                                                        |
| FG1. Preliminary assessments should be performed to reveal possible competency gaps and form the basis for learning plans.                                                      |
| FG2. Designed training materials should take in considerations the diversity of learner capabilities                                                                            |
| FG3. Courses design needs to support diverse learning styles and learner capabilities.                                                                                          |
| Implementation: Support                                                                                                                                                         |
| FS1. Employees need to be provided with technical assistance when engaging in e-learning.                                                                                       |
| FS2. Employees enquiries, questions and complaints should be collected and managed formally.                                                                                    |
| FS3. Employees need to be provided with HR support when engaging in e-learning.                                                                                                 |
| Implementation: Evaluation                                                                                                                                                      |
| FE1. Managers and learners should be able to provide regular feedback on the quality and effectiveness of courses and overall e-learning experience.                            |
| FE2. Competency and learning activity progress overview should be tracked on multiple organization levels                                                                       |
| FE3. Managers should be able to compare their follower's performance before and after training and give their feedback                                                          |
| FE4. Training material should embed preliminary assessments in order to help in training and performance evaluation.                                                            |
| Implementation: Management                                                                                                                                                      |
| FO1. Formal criteria should guide the allocation of resources for e-learning design, development and delivery.                                                                  |
| FO2. Company policies should explicitly promote e-learning as a tool for professional development                                                                               |
| FO3. Remarkable improvement in competencies should be automatically notified and possibly rewarded.                                                                             |
| Implementation: Technology                                                                                                                                                      |
| FT1. Technical standards should guide the development, delivery and maintenance of the designed e-learning content.                                                             |
| FT2. All elements of the physical e-learning infrastructure should be reliable, robust and sufficient.                                                                          |
| FT3. All elements of the physical e-learning infrastructure need to be integrated using defined standards                                                                       |
| Optimization                                                                                                                                                                    |
| FN1. Business Objectives and Performance Indicators are to be regularly reviewed and necessary changes to corresponding competencies and training material should be reflected. |
| FN2. e-learning technologies should be identified and updated regularly.                                                                                                        |
| FN3. Training and performance matrices should be aggregated and reviewed on multiple organization levels and necessary implementation changes should be performed               |

جامعة النجاح الوطنية

كلية الدراسات العليا

## إطار تكاملي لتطوير المهارات المهنية في الشركات باستخدام التعليم الإلكتروني

إعداد

وفا نبيل محمد الأدهم

إشراف

د. ايهم جعرون

قدمت هذه الأطروحة استكمالاً لمتطلبات الحصول على درجة الماجستير في الإدارة الهندسية،  
بكلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس - فلسطين.

2018

## إطار تكاملي لتطوير المهارات المهنية في الشركات باستخدام التعليم الإلكتروني

اعداد

وفا نبيل محمد الأدهم

اشراف

د. ايهم جعرون

الملخص

في هذه الدراسة تمت دراسة واستكشاف عملية تطبيق التعليم الإلكتروني في الشركات التي تعتمد نظام تطوير الكفاءات ( Competency based approaches ) في تطوير وتدريب الموظفين. اخذت الدراسة منحاً استكشافي حيث تم اختيار حالة بحثية لشركة عالمية قامت بتطبيق التعليم الإلكتروني و نظام تطوير الكفاءات ( Competency Based ) في السنوات الست الأخيرة على عدد من فروعها حول العالم.

تمت الدراسة ضمن مرحلتين، حيث تم في المرحلة الأولى عمل مقابلات مع المدراء والموظفين اللذين قاموا باستخدام التعليم الإلكتروني في الشركة، وتم جمع معلومات حول المصاعب وأهم الممارسات التي تضمنها برنامج التدريب في السنوات الست الأخيرة. لاحقاً وبناء على المعلومات التي تم جمعها ودمجها مع دراسات سابقة، تم عمل استبيان تم توزيعه لاحقاً في المرحلة الثانية من الدراسة.

تم تلخيص نتيجة البحث في نموذج تكاملي يحتوي على أهم الممارسات التي يجب على الشركات التي ترغب بتطبيق التعليم الإلكتروني في بيئة تدريبية معتمدة على نظام تطوير الكفاءات ( Competency Based ) تتلخص هذه الممارسات تحت ثلاثة أقسام رئيسية، عملية التحضير، عملية التطبيق وعملية التحسين المستمر. أظهرت الدراسة أيضاً وجود ترابط واضح بين هذه الممارسات حيث ان تطبيق نظام تعليم الكتروني في هذه البيئة يجب ان يتم من خلال عملية متكاملة ومستمرة.

