CRANFIELD UNIVERSITY

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Digitalised Solutions of Organizational Learning Capability to Enhance Performances of Public Service Organizations

SCHOOL OF AEROSPACE, TRANSPORT AND MANUFACTURING

PhD
Academic Year: 2018 - 2021

Supervisor: Dr. Ahmed Al-Ashaab and
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ABSTRACT

Public organizations provide training to enhance their employee's capabilities to provide better services. Public organizations should use different learning methods to enhance their employee's skills and service offering. Therefore, public organizations are considering using different learning programs such as classroom training, coaching, mentoring, internship, visiting fellows and other new and innovative learning programs. For the organizations to be effective in providing the learning programs to their employees, there is a need to have an approach to support these efforts. This research suggests that Organizational Learning Capability (OLC) is the right approach to do that. The OLC is defined as the facilitation of a process to ensure that the organization is learning from its operations and experiences of different projects and initiatives. This learning process is influenced by certain factors that are directly related to the performance of both employees and service provision. The research starts by performing an extensive literature review of organisational learning capability and the enabling digital technologies. Based on the findings of the literature review, a semi-structured questionnaire was developed to capture the sector perspective by interviewing employees in public service organizations within United Arab Emirates, United Kingdom, France, Poland, Spain, Norway, and Finland. This research proposes an OLC model consisting of the 3 key elements that represent the definition of OLC; the learning processes, enablers, and influential factors. The OLC model helps public service organizations to improve their learning activities and bridge the gap between investments in learning initiatives and improvement in service provision in public organizations. The OLC model helps to define all other learning programs where the coaching, Gemba-Walk and design thinking learning programs are presented in this thesis as OLC sub-models. These are new and innovative learning programs whose potentials are being explored in this research, for their ability to enhance employees and service provision within public service organizations. Moreover, two digitalised software demonstrators for the coaching and design thinking learning programs are presented in this research to reflect how digital enabling technologies could facilitate the implementation of learning programs in public services organizations. Furthermore, to validate the OLC model and sub-models, two case study validations (concerning the implementation of coaching and design thinking learning programs in a public service organization), as well as two experts' evaluations are presented in this research. The key contribution to knowledge from this research is a comprehensive OLC model that helps public service organizations introduce and implement OLC in an effective manner using enabling technologies.

Keywords: Organizational learning capability, learning programs, public service organizations, design thinking, coaching, gemba-walk, enabling digital learning technologies.

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LIST OF PUBLICATIONS

1. Alkaraeen, Mohamed & Al-Ashaab, Ahmed. (2021). Toward the Digitalisation of the Organisational Learning Capability to Enhance Organisational Performance. WSEAS TRANSACTIONS ON BUSINESS AND ECONOMICS. 18. 444-454. 10.37394/23207.2021.18.45.

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Chapter 1: Introduction

1.1 Introduction

The advent of new digital technologies presents an opportunity for revisiting the way learning programs are conducted. Organizations invest massively in learning programs to upskill human talent and improve service offering. In 2016, $359 billion was spent globally on training programs (Borzykowski, 2017). However, these investments usually lack the expected impact on service provision; three quarters of managers and employees are dissatisfied and lack the required skill to do their jobs (Glaveski 2019). Organizations are considering digital technologies to address these challenges, but, without the right deployment strategy, they risk committing the same mistakes and using technology for waste automation (Holweg et al., 2018). Thus, adopting digital technologies to deliver impactful and cost-effective learning programs requires an aligned deployment framework that accounts for the challenges digital technologies pose to learning, including employee's difficulty to undertake and complete training (Edmondson, 2012).

This research explores how organizations can bridge the gap between investments in learning programs and service provision in public sector organizations. The author adopts an organizational learning capability (OLC) perspective to study what strategic enablers and influential factors affect the link between digital technologies and organizational learning. OLC emphasises on the ability of organizations to acquire and translate knowledge from external sources, operations, experiences and initiatives into improvement changes (Leonard Barton 1992, Popper and Lipshitz 1998). OLC addresses the individual, group and organizational levels to realise the management goals (Crossan, Lane, and White 1999, Goh 2003, Lawrence et al. 2005). Exploring OLC has the potential to highlight a distinctive framework that promotes technological investments in learning.

The purpose of this research is to develop an OLC model which support the creation of a set of learning programs in public service organizations. Public service organizations have been chosen in this research as they are non-profit organization, where measuring the performance is based on the quality of the service while other commercial organizations measuring mainly on the financial gains and quality of services. The authors built a

qualitative method field study focusing on learning programs in public service organizations. Data were collected and analyzed during four phases. First, the theoretical foundations of OLC were reviewed, recording different key factors. Second, semi-structured interviews were conducted with multiple experienced participants across industrial sectors in Europe and the United Arab Emirates to capture their perspectives of the organizational learning program enablers and challenges. Third, findings from the previous two phases were reconciled to produce an OLC model which includes a detailed analysis of the role that digital technologies play in enabling the organizational learning. Also, as an outcome from the OLC model, three learning programs were developed as sub-models with two digitalised software demonstrators. Fourth, validating the proposed OLC model and sub-models through two case study validations and experts' judgments evaluations.

1.2 Research Questions

The following are the research questions that will be addressed in this study: -

1. Is the organizational learning capability a suitable approach to enhance performance and services of public service organizations?
2. What are the current implementation challenges of typical organizational learning capability approaches?
3. What is the methodology that will take OLC to the next level to enhance several major organizational performances in one approach?
4. Would the Organizational Learning Capability approach be significantly enhanced when it is employed as a digital solution to provide an integrated approach to enhance the performances and services of public service organizations?

1.3 The Aim:

The aim is to develop an organizational learning capability model that encourages learning activities in public service organizations utilising digital technology. This is to enhance the employee's skills and services offering of the public organization.

1.4 Research Objectives

To achieve the research aim, the following are the research objectives:

1. To synthesise the best practices of the OLC approaches and their applications by conducting state-of-the-art literature review.
2. To capture, via field study, the good practices and applications of OLC within public service organizations and their impact on enhancing the skill capabilities of their employees to improve service provisions.
3. To investigate how digital enabling technologies could be used to represent the solutions of different learning programs.
4. To develop an OLC model based on digital enabling technologies to enhance organizational performance and service offering in public service organizations.
5. To validate the OLC model using case studies and evaluations through expert judgment.

1.5 Structure of the Thesis

This section summaries the chapters included in this thesis. The chapters are as follows:

1. Chapter one - Introduction: This chapter introduces the reader to the research background. Also, it highlights the aims of the research, the research questions and the research objectives.
2. Chapter two - Research Methodology: This chapter presents the adopted methodology used in this research. The chosen research paradigm for this research is explained.
3. Chapter three - Literature Review: This chapter represents an extensive literature review. The main objective of this chapter is to investigate the best practices of organizational learning capability and its digital enablers. Additionally, research gaps are identified in this chapter.
4. Chapter four - Field Study: This chapter presents the current practices in public service organizations that have been captured via field study. The data were collected based on a semi-structured questionnaire developed from the outcomes of the literature review.

5. Chapter five - The OLC model: In this chapter the OLC model is proposed based on the literature review and the field study. All the elements of the OLC model is presented in this chapter.
6. Chapter six – Learning programs; OLC sub-models: This chapter presents three learning programs (coaching, gemba-walk and design thinking learning programs) as sub-models of the OLC model.
7. Chapter seven - Digitalised software demonstrator of the OLC learning program: Two digitalised software demonstrators for the coaching and design thinking learning program are presented in this chapter.
8. Chapter eight - Case study validations of coaching and design thinking learning programs and expert's judgment evaluations: this chapter presents two case studies about performing coaching and design thinking learning programs using the digitalised software demonstrators. Moreover, the expert's judgment evaluation is covered in this chapter to validate the OLC model and sub-models.
9. Chapter nine - Discussion of the results and conclusions: This chapter covers discussion, contribution to the knowledge, conclusions and future work.

Chapter 2: Research Methodology

This chapter presents the research methodology that was employed in this thesis. The research methodology was set based on the aim and objectives of this thesis. First the research paradigm is explained in section 2.1. Then the research methodology is explained in section 2.2. The research methodology consists of four phases where each phase contains several tasks.

2.1 Research Paradigm

2.1.1 Ontology

To set the stage for discussing this research methodology, this section first lays out the philosophical foundations that informed downstream decisions about research design, approach, and methods. Particularly, this section presents the ontological and epistemological assumptions that guide this dissertation. Ontology is concerned with understanding reality; what exists, what entities are real, and what is the nature of these entities (Bricker, 2014). Four main ontologies are widely discussed in management and organizations theory: post-positivism, constructivism, transformative and pragmatism (Creswell & Creswell, 2017). These paradigms dictate the assumptions about reality and so, research validity. Post-positivism researchers adopt a deterministic philosophy of reality, and so they study phenomena in a reductionist way looking for causal effects (Creswell & Creswell, 2017). Constructivist scholars assume that reality is subjective, and so they investigate how individuals develop the meaning of things based on experiences and sense-making. Transformative researchers assume reality needs to be studied considering politics to fight oppression, and so research designs provide a voice to unprivileged actors (Mertens, 2010). Pragmatist researchers are concerned with the research problem, applications, solutions, and consequences, and so, they use pluralistic data methods.

This investigation adopts a post-positivist paradigm as it has been one of the main philosophies for understanding operations management and learning. Particularly, post-positivism was selected because it focuses on external research objectivity, which is central to dealing with the internal biases inherent in the study of social phenomena. Compared to positivism, for example, post-positivism acknowledges that knowledge, hypothesis, and

theories are influenced by the researcher's bias and observation's bias; that is, all observations are fallible. Thus, this investigation adopts a post-positivist epistemology, rather than a positivist one to the study of learning in public organisations.

The Post-positivist ontology entails a set of key assumptions about what is real in the world, which guided key methodological considerations later on in this research.

1. Post-positivist researchers are reductionists, in that they focus on breaking down reality into a set of discrete set of testable variables (Creswell & Creswell, 2017). This assumption highlights the need for defining *a priori* a theory to test, and a set of key variables that affect the phenomena under investigation. For this research, such theory is organizational learning, and its variables are extracted from a careful investigation of its state of the art.
2. Knowledge emerges from a meticulous observation and measurement of what is out there (Creswell & Creswell, 2017). While this implies a preference for quantitative methods, qualitative data collocation methods are also possible. For one, qualitative data collection (i.e., interviews) allow for capturing the subjectivity of the reality – an essential condition for understanding organizational learning. Then, knowledge results from developing numeric measures of observations.
3. Researchers start by making claims about an established theory, and then refining or abandoning it for observations that better explain the phenomena. Thus, the author starts with a theory testing approach, and include an open-ended section in my research design to validate and refine the observations.
4. Objectivity is key. Thus, the researcher needs to acknowledge and address biases that emerge along the research.
5. Data informs knowledge. The researcher collects information on instruments and measures designed to assess observations and data from the real world.

2.1.2 Epistemology

Ontology and epistemology go hand in hand. While ontology concerns with objects that exists, epistemology concerns itself with knowledge - how ideas in the mind can be 'known to mirror the objects outside the mind' (Cruickshank, 2017). This involves questions such as what is knowledge? How is it acquired? What is possible to know? Defined as justified true

belief, knowledge, provides the link to understand the world, its individuals, and phenomena. For beliefs to be considered knowledge, they shall emerge from sources that we consider reliable, including perception, introspection, memory, reason and testimony (Steup & Neta, 2020). Specifically, this research uses reason and testimony as main sources for creating knowledge about organizational learning capability.

2.2 Research methodology

The research methodology adopted for this research consists of four phases where each phase contains several tasks. Table 2.1 presents the research methodology used in this research.

Table 2. 1: Summary of the four phases considered in this dissertation methodology.

Phase	Key Tasks	Deliverables
Phase 1. Theoretical Framework	1.1 Conduct an extensive literature review about organizational learning. 1.2 Synthesise organizational learning best practices and applications. 1.3 Develop a questionnaire for the field study.	• Research gaps • Questionnaire
Phase 2. Field study	2.1 Approach public organizations and invite them to participate in the study. 2.2 Conduct interviews with actors responsible for learning in public organizations (Europe and UAE). 2.3 Analyse collected data.	• Industrial 'best practices'
Phase 3. Model Development	3.1 Analyse technologies that can facilitate organizational learning capability. 3.2 Develop an OLC model and corresponding sub-models for learning programs. 3.3 Develop a technology-based solution based on the previous two tasks to promote OLC in public organizations.	• OLC models

Phase 4. Validation and Evaluation	4.1 Validate models using an in-depth case study. 4.2 Validate models with a panel of experts on organizational learning and digitalisation.	• Validated models

2.2.1 Phase 1: Theoretical framework

This phase aimed to create a theoretical framework for understanding the process of building an OLC. This phase involved the following tasks:

1.1 Conduct an extensive literature review about organizational learning.

1.2 Synthesise organizational learning best practices and applications.

1.3 Develop a questionnaire for the field study.

In this phase, a systematic review of the literature was conducted, to be able to comprehensively cover the various topics that this dissertation is concerned with (i.e., organizational learning organization, digitalisation, and performance management). This phase focused on understanding the state-of-the-art organizational learning capabilities from both a private and public services perspective. Also, it focused on understanding digital enabling technologies and its link to organizational learning.

To complete this phase, this dissertation used databases available at the University of Cranfield, including Scopus, Emerald and Web of Science. The following key words were used: 'Organizational Learning' or 'Organizational Learning Capability' and 'public services' or 'public organizations' or 'public sector'. Wildcards were further used to capture differences in spelling between American and British English, and to capture variations for the key words (e.g., 'Organi?ation* learn* capababilit*'). Similarly, the following keywords have been used to investigate the digital enabling technologies: 'Digital Transformation', 'Digitalisation' or 'Digitisation' or 'Digital Learning'. Wildcards were also used in this phase. Then, the results of this search were filtered by selecting only peer-reviewed articles, books, chapter and case studies. Further filtering was applied by language (only English),

date (1980 - 2021), and domain of expertise (everything unrelated to business, management and learning was excluded)

Once all documents were collected and filtered, abstracts were read and further excluded those which did not relate to this research. Then, in-depth reading of all documents was performed and captured organizational learning 'best practices', 'steps' and 'facilitating factors' identified in the literature. Similarly, after capturing the needed data, the author proceeded to identify key themes for the questionnaire, and proposed example questions to drive the interview section.

2.2.2 Phase 2: Field study

This phase included the following tasks:

2.1 Approach public organizations and invite them to participate in the study.

2.2 Conduct interviews with actors responsible for learning in public organizations (Europe and UAE).

2.3 Analyse collected data

The researcher completed a field study in Europe and the UAE. A questionnaire was designed to investigate and gain better understanding about the learning provided by public organizations to their employees. A semi-structured interview protocol was used to collect data from face-to-face conversations and video conferencing calls. The protocol covered key aspects mentioned in the literature including learning processes, enablers, influential factors, and digital technologies. The study interviewed 37 employees from 30 public sector organizations from seven countries: U.A.E., U.K., France, Poland, Norway, Spain, and Finland. The author collaborated with an MSc group project whom its member help to arrange several interviews in Europe. The sample representatives include managers in healthcare, education, social care, local authorities, and law enforcement sectors. The details of the interviewees and their organizations are in Chapter 4 Section 4.2 Table 4.2. The collected data was analysed to obtain the sectors' perspective of OLC to be used in developing different OLC models based on the digital enablers technologies.

Interviews are a qualitative data collection method that uses conversation for insights and in-depth exploration of the phenomena studied (Lofland & Lofland, 1984; Charmaz,

2000). Three types of interviews are possible: Structured, unstructured and semi-structured interviews. During structured interviews, questions are defined *a priori* and are particularly useful for validating constructs. Instead, during unstructured interviews, questions emerge as the conversation progresses and so are more useful for theory building and exploration. Finally, during semi-structure interviews, the researcher *a priori* defines topics to explore, but the specific question emerges from the conversation. For this dissertation, a combination between semi-structured and structured interviews was adopted. For one, this allows the researcher to validate constructs discussed in the literature review about organizational learning capabilities, while the open questions ensure discussion of topics the interviewee thinks may affect the research but have not yet been considered in the literature.

To accomplish this goal, the researcher used theoretical sampling, i.e., interviewees were selected based on their position and knowledge of learning in public organizations. They are a small, yet diverse group (n = 37) from multiple public service organizations, privileged with insights, external or insider experience about learning programs and their digitalisation. For supporting semi-structured interviews, the researcher developed a topic guide with key themes and potential questions. Furthermore, for each theme considered in the interview, Likert-scale (Likert, 1932) type questions were included to facilitate the comparison of answers. These questions facilitated the evaluation of responses by translating verbal responses to numerical scales.

When possible, interviews were conducted face-to-face as it allows for capturing non-verbal communication that may give hints of what a person does not want to say due to politics or because it is not perceived as appropriate responses (Charmaz, 2000). Nevertheless, in some other instances, it was necessary to conduct remote interviews. This was the case particularly for those interviewees who had a tight agenda or work in very remote areas, where access might be problematic. For conducting remote interviews, synchronous mediated interviews methods were used, including zoom and skype video calls. Emails and other asynchronous interviews methods were avoided as they may affect the quality of the information collected (Tracy, 2010); in these scenarios, participants are subject to distractions, biases, and world-related pressures that decreases the quality of the data collected.

Since conducting and analysing interviews was a time-consuming process, this investigation followed a critical incident technique (Flanagan, 1954) and used the Likert scale question to isolate key factors associated with learning programs implementation, capabilities building and digitalisation. This facilitated keeping a focus on the phenomena under investigation and prevented gathering noise and data that did not correlate to the topic.

The author rated organization using a 1-5 Likert scale where higher scores indicate greater effectiveness and/or adoption on 4 areas: learning processes, enablers, facilitating factors, and challenges in adopting digitally enabled learning processes. The same measurement applied to the frequency wherever it occurred. Data were filtered to include only inputs with an average effectiveness above 3.

2.2.3 Phase 3: Model Development

To develop the process model, the following key tasks were completed:

3.1 Analyse technologies that can facilitate organizational learning capability.

3.2 Develop an Organizational Learning Capability model and corresponding sub-models for learning programs.

3.3 Develop sub-models based on the previous two tasks.

The proposed OLC model is developed based on the findings of the literature review and field study. The OLC model consists of the learning processes, the enablers, the influential factors, and the enabling digitalised technologies. First, the learning process was detailed adapting continuous improvement process (Plan-Design-Deliver-Evaluate) (Moskowitz, 2008). The process was tailored to learning programs by adding an additional initial stage called “knowledge gap identification”. This stage covers the identification of skills and competences required for the organisation to deliver products services and meet its strategy; bridge the gap between the current and future performance. Second, the enablers were selected based on the literature on organizational learning and the learning organization – refer to Section 3.3.3. Using thematic analysis, this study identified a set of learning enablers in organisations including supportive leadership, learning in communities, altruism, relationship with universities, visualisation, and new technologies among others. Third, similarly to the enablers, the influential factors were distilled based on analysing different organisational learning capability frameworks presented in Section 3.3.4. As means to

validate and refine these elements, a field study was conducted within public service organizations. This help to capture the sector perspective on the main elements of OLC. Then, these three components where integrated into the final OLC model shown in Figure 5.1. Finally, this study proposed a model for digitalised learning. The decision to focus on a digital learning aims to leverage the benefits of new digital technologies for organizations. In this context, some benefits include increased speed of learning delivery, reduced cost copies of learning programs at marginal zero cost, and increased access to learning programs by allowing individuals access content independently of the location and time. As the author believe that any learning programs can be implemented within the OLC model, three sub-models have been identified as example of implementing learning programs within the OLC model. The three learning programs has been chosen based on the following:

- Coaching: As an outcome of the field study where the sector perspective shows that coaching learning program is one of the most effective learning methods.
- Gemba-Walk: In order to introduce a new learning program in public service organizations which is based on group problem solving between the senior management and the employees within the organization and leads to get the senior management closer to the service provision and the employees and enhance the service provision in the organization.
- Design thinking: In order to introduce a new learning program in public service organizations which increase the innovation within the organizations and introduce more innovative solutions.

Those three sub-models are proposed to present the applications of different learning programs within an OLC environment.

Evaluating digital enabling technologies to enhance OLC applications is done by analysing various best practices found whilst reviewing the literature. Furthermore, two digitalised software demonstrators of coaching and design thinking learning programs were developed to reflect how digital enabling technologies could facilitate the implementation of learning programs in public services organizations and to be used in the case study validations.

2.2.4 Phase 4: Validation & Evaluation

This phase included the following key tasks:

4.1 Validate models using in-depth case studies.

4.2 Validate models with a panel of experts on organizational learning and digitalisation.

A two-step validation was conducted. Two practical case studies (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Ketokivi & Choi, 2014) were conducted at a public service organization in UAE to validate the proposed OLC model. These cases included the performing coaching and design thinking learning programs. These cases lasted seven and four weeks respectively. In addition, the model was validated by a panel of experts on the field of organizational learning. The OLC model was updated according to the feedback from the expert judges.

Chapter 3: Literature Review

3.1 Introduction

The aim of this literature review is to examine current approaches to organizational learning capability, and to identify the limitations within it. In order to achieve this, it is necessary to examine contemporary research on the field. This involves understanding what organizational learning capability is, and also the manner in which researchers believe the organizational learning capability to be utilised to improve performance at public service organizations. As a result of the need to investigate this, the current chapter contains three main parts. The first introduces the public service sector and its unique characteristics in comparison to other continents, whilst the second examines the principal concepts related to organizational learning capability. The third investigates the use of digital enabling technologies in OLC.

The basis of this review is literature found from searching databases that were believed to contain abstracts from scientific papers on organizational learning capability. The search focused on papers and research published between 1980 and 2021. The searches were conducted both at the beginning and at the conclusion of this research thesis, to allow the identification and inclusion of relevant research findings that had arisen during the production of this research. Figure 3.1 presents the literature review map.

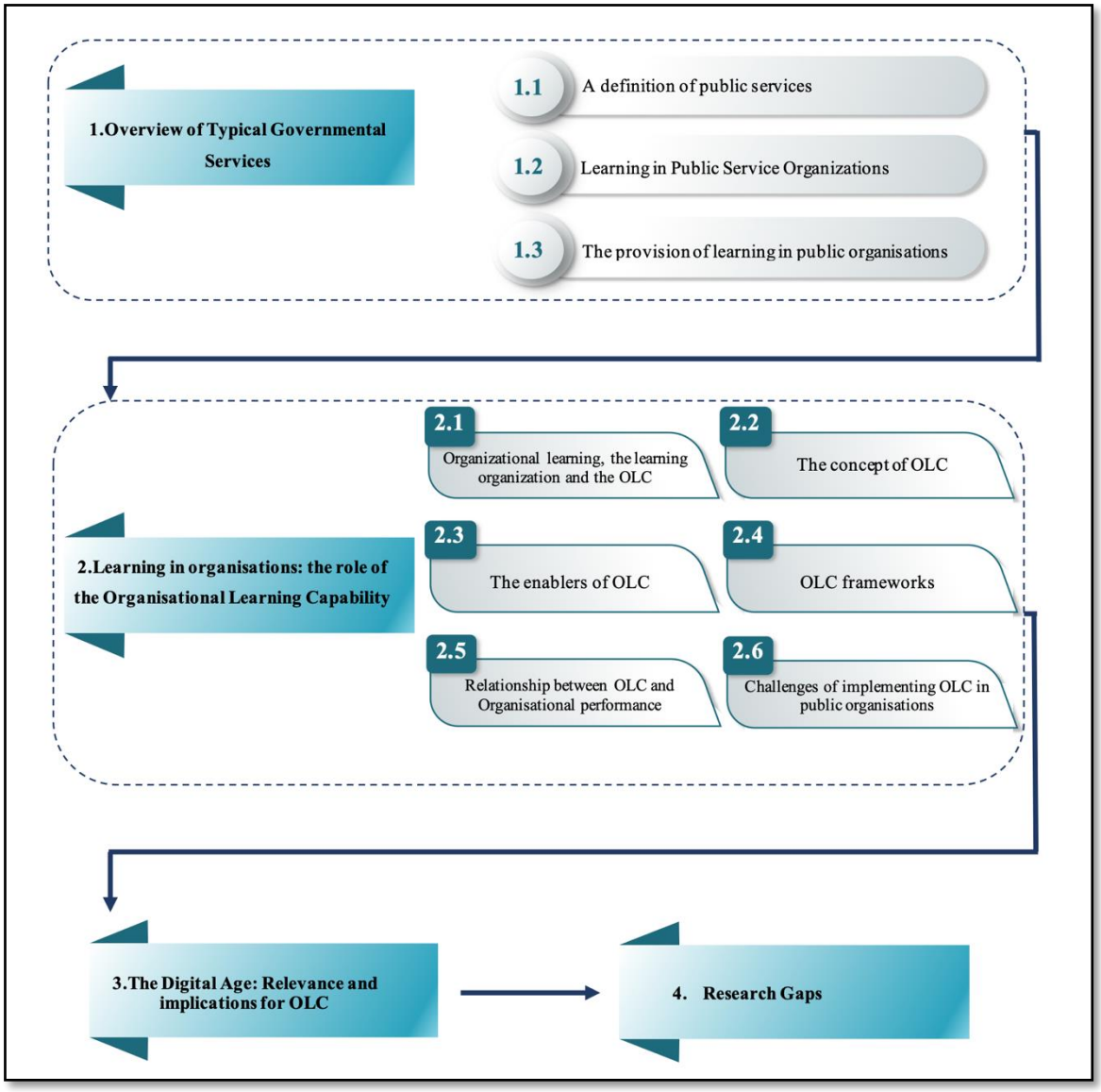

Figure 3. 1: The literature review map.

3.2 Overview of Typical Governmental services

3.2.1 A definition of public services

"Public services" are services provided by the government in general to the society living in its jurisdiction, either directly (through the public sector) or by commissioning. These services are not for profit and are provided to all, regardless of income, physical ability or mental acuity. Four functions of public services are derived: "The national defence function; establishing an administration of justice which provides for law and order in society; the duty

of establishing public institutions and necessary public works that private firms could not profitably supply (Smith, 2010); and the duty of meeting expenses necessary for the support of the sovereign". A comprehensive list of public services in modern societies includes justice, education (e.g. public schools, universities, etc...), utilities, emergency services (e.g., police, firefighter, paramedics), healthcare, public health, public order/security, competition & consumer protection, immigrations & customs, global affairs, economic development, transportation, infrastructure, urban planning, social services, postal system, public broadcasting, arts and culture, natural resources, recreation, and environmental protection among others (Spacey, 2019).

Since public service organizations are not for profit, public services are not measured only by their efficiency, but also by their capabilities to meet the community needs. Albury (2005, p. 51) highlights that these services should be "responsive to the needs and aspirations of individuals and communities, threat users with respect and dignity, and enable greater individual and collective engagement". This brings into focus the need for having performance assessment metrics that allow public services to support its institutionalisation. In this matter, scholars have proposed to use legislative and process conformance, fiscal health, responsiveness and accountability as key assessment metrics for designing and improving public services (Andrews and Shah, 2003).

3.2.2 Learning in Public Service Organizations: Training and Development

Learning in a public service organization is significant for public organizations around the globe. Historically, practice shows a focus on training and development initiatives. Le Grange (2004), Fraser (2005) and Webb (1996) maintain that the vision of staff development extends well beyond the mere improvement of skills. Staff development is usually understood in terms of processes, structures and programs that are aimed at harmonising individual and institutional interests towards mutual growth.

According to the "2017 Training Industry Report" conducted by the "Training Magazine 2017", the US spends a total of $90.6 billion dollars on training and development programs for its employees. Such programs utilise different training methods including leadership and management skills trainings, communication and presentation skills, in

addition to mentoring and coaching etc. Face to face as well as virtual trainings had been conducted and utilised.

Despite the fact that training is the most common learning program, its effectiveness to enhance the quality of service provision is questionable (Glaveski 2019). Therefore, there is a need to consider more learning programs to support the service provision.

3.2.3 The provision of learning in public service organizations

Most public organizations follow the steps and the international trend in training, utilising the methods (Borisova, et al. 2016). Particularly, in UAE, there has been a serious adoption of smart learning. The government set various platforms for smart learning to support the classic or traditional learning methods. For example, The Federal Authority for Government Human Resources has developed a smart platform to train the federal government employees (see https://www.fahr.gov.ae/Portal/en/legislations-and-guides/systems/training-and-development-system.aspx). Table 3.1 presents different learning programs in use in organizations.

Table 3. 1: Definition of the most common learning programs.

	The learning program	Definition	References
1	Traditional training	Usually exemplified by classroom learning, traditional training refers to a dynamic and social experience where teachers and students work together to meet the objectives of an established curriculum.	(Shuell, 2001)
2	Apprenticeship	An apprenticeship is a type of formal training usually deployed for blue-collar industries, yet it is becoming more popular in white-collar sector. Traditionally, apprenticeship last for one or two years.	(Wolter and Ryan, 2011)
3	Internship	An internship is a short-term training that provide interns with some exposure to a particular area. This opportunity is usually offered to students while they are still studying. Since an internship last from a few weeks to a couple of months, this form of training does not lead to any source of qualification.	(Sweitzer and King, 2013)
4	Graduate Program	Graduate programmes are programmes designed to bring graduates with excellent academic results but minimal experience to the company. These programmes are a fast track to leadership roles and are usually complemented by coaching and mentorship.	(Al-Hawamdeh, 2005)

5	Pilot project initiative	Pilot projects are initiatives designed to allow the organisation to conduct experiments in a controlled way. Pilots are considered a learning program as employees learn through the implementation and testing of pilot in a more hands-on manner. This program does not normally involve training but rather is focused on learning by experience.	(Bose, 2003; Chou et al., 2012)
6	Coaching and mentoring	This type of training involves the development skills by leveraging on-to-one relationship between one experienced and less experience person. Mentoring is a particular sort of coaching whereby executives groom more junior employees. Mentoring is a long process and usually last for several years.	(Knight, 2008; Martens, 2012)
7	Formal degree sponsorship	In this program, an institution provides a scholarship for a student to undertake undergraduate or postgraduate studies. The institution can provide full sponsorship, covering tuition fees, accommodation, transformation fees and material fees. Other times the institution provides a partial sponsorship, which covers only a portion of the total studies costs.	(Greene et al., 1997; Hall, 2013; Setiabudi et al., 2019)
8	Visiting fellow	This program allows the research to undertake research in a visiting institution. The fellowship provides the student with rewards, such as an annual stipend, allowance to cover the travel expenses, or supplemental benefits related to health insurance, housing, or cover family expenses.	(Gruppen et al., 2006)
9	Customised degree	This program refers to bespoke training usually provided to a group of individuals in the same organisation, who require developing skills and knowledge essential for the firm operations.	(Street and Lacey, 2018)

Table 3.1 listed different learning programs that could be used to support different aspects of enhancing service provision quality depends on the needs and applications within the organization. Their effectiveness it depends on the design and implementation of the different tasks of the individual learning programs. Therefore, there is a need for an environment that guide an organization to follow, implement, measure the impact of these learning programs in an effective manner using enabling technology.

3.3 Learning in organizations: the role of the Organizational Learning Capability

3.3.1 Organizational learning, the learning organization, and the organizational learning capability

Theories of organizational learning have played a fundamental role in the development of management and organization theories for a long time. For instance, the concept of organizational learning has been used in academic spheres to provide the pillars of managerial theories such as the behavioural theory of the firm (Cyert and March, 1963). Cyert and March challenge the, by the time, prevailing neo-classical economic assumptions of perfect knowledge and perfect allocation of internal resources, and instead recognises learning is necessary to overcome the asymmetry of information between organizations. Such an approach highlights improvement as a process driven by the organizational learning actions. For example, the firm's ability to develop balancing mechanisms for exploring and exploiting new resources configurations (March, 1991). Similarly, organizational learning has also been central for evolutionary models (Nelson and Winter, 2002), which built on the concept of skills to describe how organizations develop capabilities and encode expertise in routines for adaptation and change. Thus, building upon these models, researchers have theorized that organizational learning is defined as a routine-based, target-oriented and history-dependent process (Levitt and March, 1988).

Since that point, the literature on organizational learning has evolved with rather different trajectories. Some authors have explored how a group learns under the rubric of the learning organization (Senge, 2006; Örtenblad, 2007; Bak, 2012; Caldwell, 2012a, 2012b), a concept that refers to an "organization where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free and where people are continually learning how to learn together." (Senge, 2006, p. 30). While others have focused more on the theoretical aspects of learning and the management of content. Easterby-Smith and Lyles (2011) distilled four core concepts associated with the streams of research on organizational learning. They map out these concepts differentiating between theory and practice, and process and content. The four concepts are organizational learning, knowledge management,

the learning organization, and organizational knowledge. The diagram in Figure 3.2 depicts the relationship between the four core concepts:

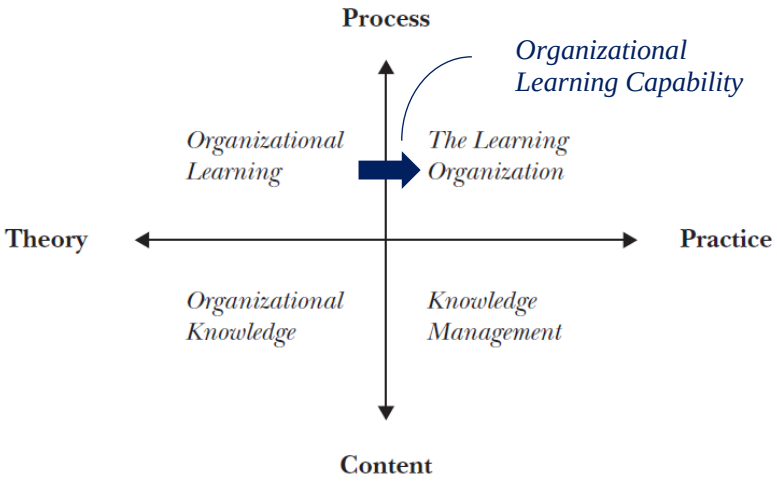

Figure 3. 2: Situating the Organizational Learning Capability based on the map of key concepts for organization learning. (Easterby-Smith and Lyles, 2011).

For this research, the author focuses on the top part of the chart and the distinction between "organizational learning" - the underlying theory – and "the learning organization" – the practice. A closer look at the figure shows a clear disconnection between the two concepts. Thus, the author modified the original figure and draw the organizational learning capability (blue arrow) as the concept that enables the application of the learning theory into an organization. This is an important concept because it affects not only the current performance of the organization but also its ability to innovate and adapt to changes in the environment (Alegre and Chiva, 2008; Jiménez-Jiménez and Sanz-Valle, 2011). This brings organizational learning capability as a strategic concept of interest for managers in both public and private organizations.

3.3.2 The concept of organizational learning capability

There are as many definitions of Organizational Learning Capability as there are studies on the field. However valuable they are, they have failed to build upon others work and integrate insights from previous research. For instance, recent scholars define Organizational Learning Capability, as "the organizational and managerial characteristics or factors that facilitate the organizational learning process or allow an organization to learn" (Moghadam, 2013).

However, such definition seems vague and does not specify the nature of the factors or managerial characteristics that facilitate organizational learning, neither comment on what is involved for an organization to learn. Thus, for that end, the author reviewed the field literature to refine our understanding of what is organizational learning capability.

Looking to ground the notion of organizational learning into actions and structures, multiple scholars have provided an alternative definition of organizational learning (Leonard-Barton, 1992; Cook and Yanow, 1993; Popper and Lipshitz, 1998; Goh and Wiegmann, 2001). The first dimension of the reviewed definitions highlight the strong link between organizational learning and realising change, underlying that the field of organizational learning needs to study 'the concrete structural and procedural arrangement through which actions by members that are understood to entail learning are followed by observable changes in the organization's pattern of activities' (Cook and Yanow, 1993, p. 375). The second dimension distilled from the literature, is that organizational learning is a multidimensional process involving individuals, groups, and organizations (Crossan, Lane and White, 1999; Goh, 2003; Lawrence et al., 2005). For instance, some definitions stressed the role of individual and team learning in achieving the firm targets "the product of individual and group learning applied to achieve the organization's vision and performance goals" (Goh, 2003). Finally, researchers have recognised the role of management practices and structures in supporting or hindering learning and thus has proposed to understand organizational learning capability as the "the ability of the organization to implement the appropriate management practices, structures and procedures that facilitate and encourage learning" (Leonard-Barton, 1992; Popper and Lipshitz, 1998).

Based on that understanding, organizational learning capability facilitates a process to learn. The OLC has been defined in this research as "the facilitation of a process to ensure that the organization is learning from its operations and experiences of different projects and initiatives. This learning process is influenced by certain factors that are directly related to the performance of both employees and service provision" (Alegre and Chiva, 2008; Moghadam et al., 2013). The ability of an organization to acquire and translate knowledge from external sources, operations, experiences and initiatives into improvement, changes at the individual, group and organizational level to realise the management goals. That ability

is achieved through practices, structures and procedures that enable four learning mechanisms to know: Intuiting, Interpreting, Integrating, and Institutionalising (Crossan, Lane and White, 1999). This mechanism happens at different levels of the organization. First, the individual learns through Intuition, “the preconscious recognition of the pattern and/or possibilities inherent in a personal stream of experience” (Crossan, Lane and White, 1999, p. 525). Intuiting is complemented by a process that involves the individual interacting with a group: Interpreting, “the explaining, through words and/or actions, of an insight or idea to one's self and others" (Crossan, Lane and White, 1999, p. 525). The third mechanism is integrating: first, that occurs at the group level. It is "the process of developing a shared understanding among individuals and of taking coordinated action through mutual adjustment" (Crossan, Lane and White, 1999, p. 525). The final mechanism is Institutionalising “systems, structures, procedures and strategy” (Crossan, Lane and White, 1999, p. 525). Figure 3.3 shows the organizational learning from individual to organization by Crossan, Lane and White (1999).

A key area that remains understudied concerns how to translate theoretical concepts into actionable learning in organisation. Previous research has focused on ‘*What’* questions about learning, such as what mechanisms are involved in organisational learning (e.g., Crossan, Lane and White, 1999), or what managerial characteristics facilitate organizational learning (Moghadam, 2013). However, with a few exceptions (c.f. Lawrence et al., 2005) research questions about ‘*how’* such mechanisms and managerial characteristics are enacted and can be reorganised to facilitate learning in organisations are largely amiss so far in the organizational learning literature. To explore how learning happens in practice, the following section layouts the learning’ enablers and influential factors.

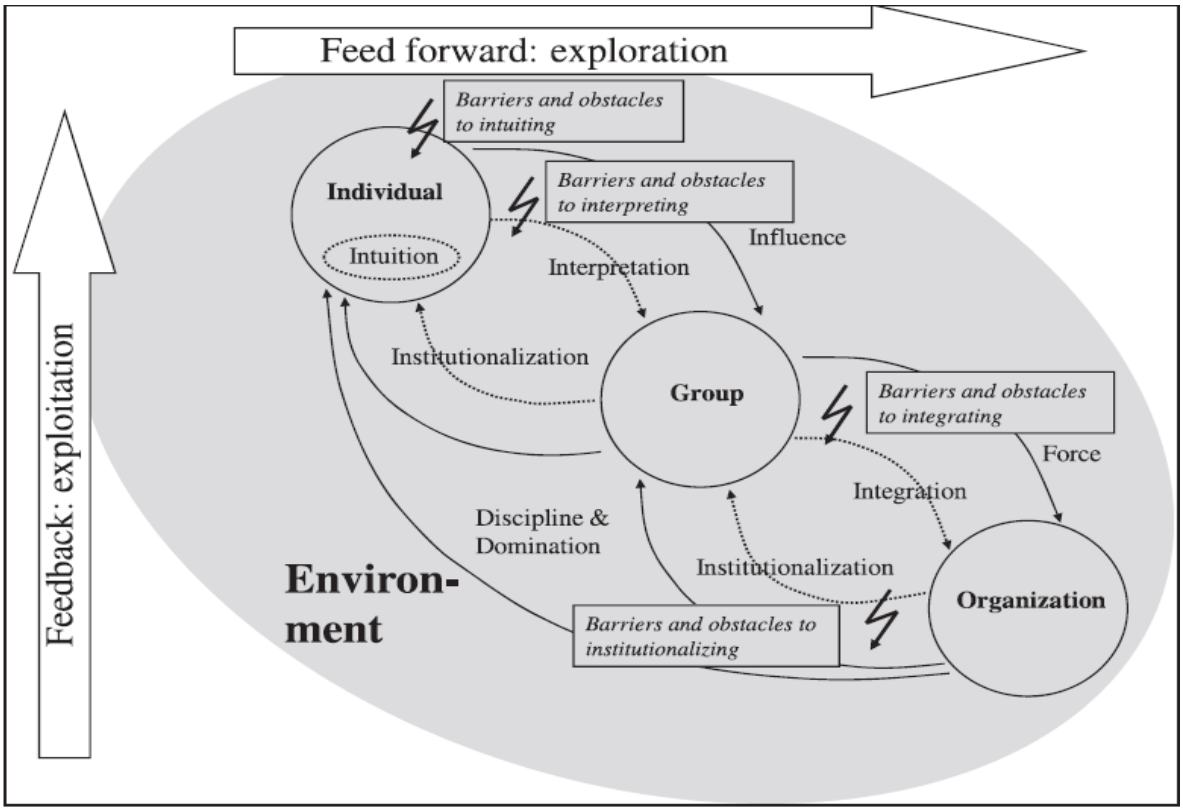

Figure 3. 3: Organizational learning from individual to organizations (Crossan, Lane and White, 1999).

3.3.3 The enablers of organizational learning capability

Based on the definition of organizational learning capability, the author classifies the enablers of Organizational Learning Capability into four themes: (1) acquire and capture knowledge, (2) translate knowledge into learning and integration, (3) realise management goals, (4) drive systemic change. First, "acquire and capture knowledge" enablers are those that allow the organization to grab learning experiences from its employees, associates, competitors and in general, from the environment. For example, practices that let the organization systematically record "best practices" and challenges that similar sectors face, and practices that allow the company to capture lessons learned in the frontline. Thus, these enablers focus on capturing the knowledge source, differentiate the product-process focus, and on establishing a mode of documentation (DiBella, Nevis and Gould, 1996)

The second theme focuses on translating knowledge into learning and integrating it into the organization (c.f. Jerez-Gómez, Céspedes-Lorente and Valle-Cabrera, 2005). By

contrasting manufacturing and service organizations, researchers have found that the development of organizational learning capabilities is context-dependent. They have distilled a set of dimensions that influence the process of developing organizational learning capabilities including the learning focus, dissemination mode, and skill development (DiBella, Nevis and Gould, 1996). These practices allow the organization to transfer knowledge effectively, improving problem-solving at the individual and group level (c.f. Goh, 2003). This theme also involves creating/updating standard procedures to incorporate the learned knowledge and enablers that institutionalise those practices.

The third theme in the literature has recognised the importance of enablers that allow the organization to realise management goals (c.f. Goh, 2003). Examples include creating and sharing a clear mission and vision that create common mental models (Senge, 2006; Goh, 2003). Furthermore, experimentation (Jerez-Gómez, Céspedes-Lorente and Valle-Cabrera, 2005) and having appropriate rewards systems are also important in this area (Goh, 2003)

The fourth theme focuses on driving systemic change in the organization. This theme recognised that change needs to follow a top-down approach. As such, it focuses on leadership support and empowerment (Goh, 2003; Jerez Gómez, Céspedes Lorente and Valle Cabrera, 2004; Jerez-Gómez, Céspedes-Lorente and Valle-Cabrera, 2005; García-Morales, Jiménez-Barrionuevo and Gutiérrez-Gutiérrez, 2012; Moghadam et al., 2013). Researchers have found that transformational leadership plays a major role in supporting organizational learning and performance (García-Morales, Jiménez-Barrionuevo and Gutiérrez-Gutiérrez, 2012). Thus, managerial commitment and following a system perspective to drive change becomes necessary to enable the learning (Jerez-Gómez, Céspedes-Lorente and Valle-Cabrera, 2005).

A summary of the enablers of the organizational learning capability is presented in Table 3.2.

Table 3. 2: Identifications of OLC enablers.

ID	Reference	Supportive Leadership/ management	Learning in Communities	New technologies	Knowledge Capture
1	Jerez Gómez, Céspedes Lorente and Valle Cabrera, (2004)				x
2	Chiva, Alegre and Lapiedra, (2007)				x
3	Bontis, Crossan and Hulland, (2002)	x			
4	Çömlek *et al.*, (2012)	x	x		x
5	Gomes and Wojahn, (2017)				x
6	Alegre and Chiva, (2008)	x			
7	Khalib, Kassim and Ghazali, (2015)				x
8	Nonaka, Toyama and Konno, (2000)		x		
9	Warhurst, (2013)			x	
10	Petiz, Ramos and Roseiro, (2015)		x		
11	Oviedo-García *et al.*, (2014)		x		x
12	Hazlett, McAdam and Beggs, (2008)		x		
13	Haho, (2014)	x	x	x	x
	TOTAL	4	6	2	7

The identified enablers of organisational learning capability shown in Table 3.2 are described as the following:

- **Supportive leadership/management**: Supportive management is central enabler for organisational learning (Alegre and Chiva, 2008; Bontis et al., 2002; Çömlek et al., 2012). It refers to the degree to which employees receive support and encouragement when presenting new ideas, so they feel encouraged to experiment and generate new knowledge (Alegre and Chiva, 2008). When management encourages experimentation, employees are incentivised to try different variations of the same problem/ routine until finding improved solutions. When management unwelcomes

learning, however, firms hamper the exploration of new, which consequently, truncates the learning process.

- **Learning in communities:** Similar to participation in the workplace, learning in communities is an enabler for the socialisation of tacit knowledge. Specifically, learning in communities enable information sharing and the dissemination of ideas across the firm (Çömlek et al., 2012). Learning in communities help individuals to find meaning in collective experiences and make sense of problems. The community facilitates the interpretation of shared experiences by providing a shared vocabulary and other tools that act as a common framework for all members to learn and share knowledge. (Crossan et al., 1999). – combine these 2 ---!!!!! Participation in the workplace (a.k.a socialisation) refers to the process whereby employees convert tacit knowledge, such as experiences, mental models and understanding of the world via socialising with peers (Nonaka et al., 2000).
- **New technologies:** New information and communication technologies can facilitate interactions with the external environment, and so, learning in the focal organisation. In that sense, new technologies that act as an interface between the internal and the external environment may enable learning. Consider for instance, the use of online courses for training employees on new skills. Technology helps to remove physical and temporal barriers by allowing the participant to access course content at any point during the day and from any location.
- **Knowledge capture:** Knowledge capture refers to the ability of the firm of acquiring knowledge from internal and external sources. Visualisation, altruism, and relationship with universities are examples of strategies to foster knowledge capture. For example, visualisation tools allow to transform tacit and complex knowledge into explicit and digestible insights. Such as insights, can be picked by management to make key decisions, which may affect the organisational performance. Similarly, cultures that promote cultures based on altruism, are more likely to share insights and collaborate to capture experiences and learning. Finally, fostering relationships with universities is central for capturing external learning. These relationships act as

alliances with actors in strategic positions inside the innovation network, which provides early access to new R&D (Azagra-Caro et al., 2006).

Later in this research, the enablers have been considered as the pillars for developing the OLC model. Because knowledge capture is quite wide in scope and in importance for organisational learning, this research further subdivided it into visualisation, altruism, and relationship with universities. Thus, in total, this research considers six enablers which are supportive leadership, learning in communities, altruism, relationship with universities, visualisation, and new technologies which have been used in the field study – refer to Figure 4.5.

3.3.4 The Organization Learning Capability Frameworks

The world changes made learning and adapting more critical competitive advantages for organizations. Researchers had been exploring and proposed various frameworks. Various papers discussed the conceptual frameworks of organizational learning capabilities and knowledge performance.

Chiva, Alegre and Lapiedra, (2007) in their research, tried to propose and validate a measurement scale capturing the organizational capability to learn, based on a comprehensive analysis of the facilitating factors for learning. Their organizational learning capability scale consists of 14 items grouped into five dimensions: experimentation, risk taking, interaction with the external environment, dialogue, and participative decision making.

Figure 3.4 presents the conceptual model of organizational learning capability (OLC) by Chiva et al, (2007)

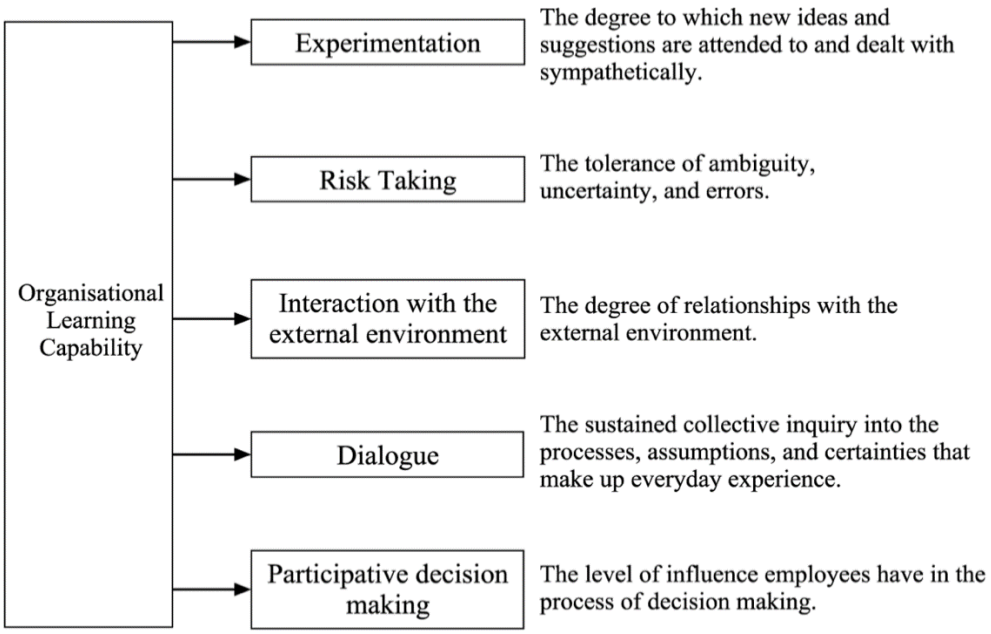

Figure 3. 4: The conceptual Model of Organizational Learning Capability (OLC) (Chiva et al, 2007).

Shamsul, Kassim and Salleh, (2011) proposed a framework that has eight dimensions. These dimensions are (1) System thinking (2) Organizational culture (3) Leadership (4) Information Communication Technology (ICT) (5) Transfer of knowledge (6) Teamwork cooperation (7) Shared vision and mission (8) Employee's skills and competencies. Five are main independent variables: shared vision and mission, organizational culture, teamwork cooperation, transfer of knowledge and ICT. The dependent variable is knowledge performance which has been adopted from the previous models and scholarly literatures. Figure 3.5 presents organizational learning capabilities model by Shoid, Kassim and Salleh (2011).

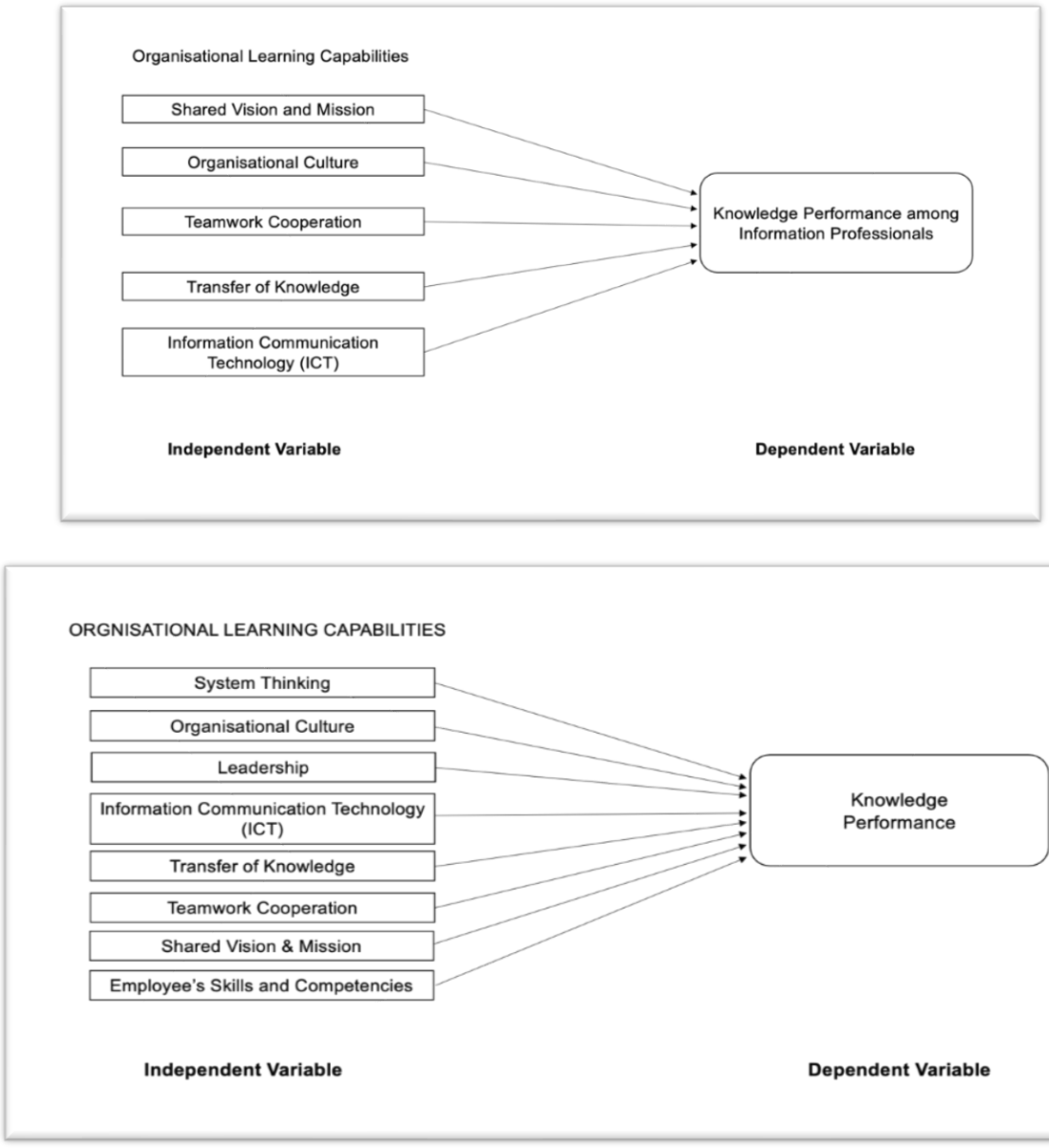

Figure 3. 5: Organizational Learning Capabilities (OLC) Research Model (Shoid, Kassim, & Salleh, 2011).

Linking OLC to job satisfaction had been investigated by Khalib et al (2015). Their research reviewed previous literature, working towards developing a conceptual framework of a study on organizational learning capabilities and job satisfaction of employees in an organization. Based on previous models and scholarly literature (Chiva, 2007; Shamsul et al, 2011) four main independent variables are identified, namely, organizational culture, leadership, dialogue, and participative decision-making, while the dependent variable is job

satisfaction. Figure 3.6 presents conceptual framework of organizational Learning Capabilities (OLC) toward Job Satisfaction by Khalib et al (2015).

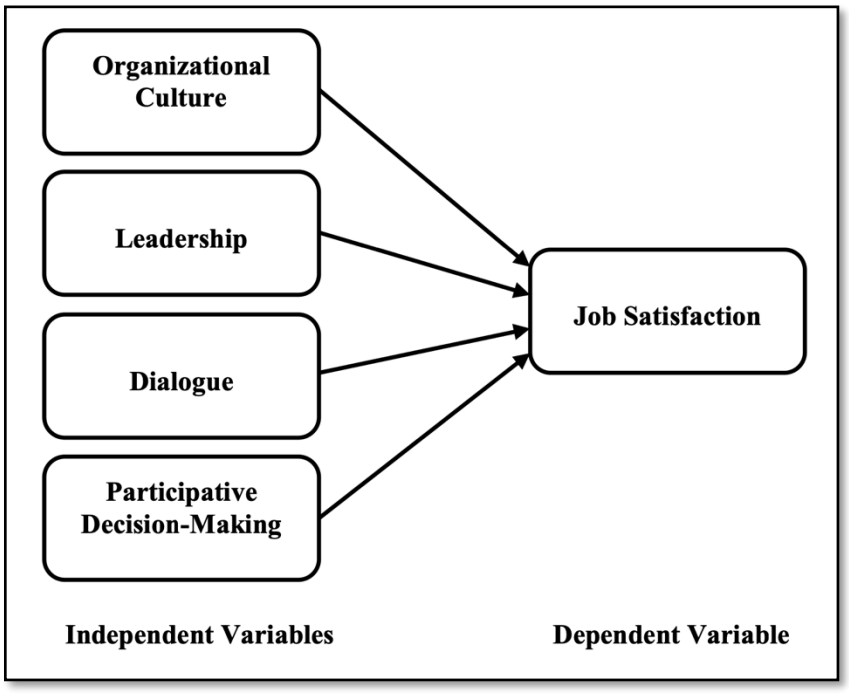

Figure 3. 6: Conceptual Framework of Organizational Learning Capabilities (OLC) toward Job Satisfaction (Khalib, Kassim et al, 2015)

Mat and Razak (2011), published a paper proposing a framework shown in Figure 3.7 to explore the relationship between organizational learning capability, knowledge complexity and their impact on technological innovation (product) implementation success. The paper aimed to investigate the framework knowledge complexity as a moderating effect on the relationship between organizational learning capability and technological innovation (product) implementation.

Their work focused on the implementation phase of the innovation process, where innovation must be fully developed before being implemented. Identification of success or failure of innovation can be done through the implementation phase.

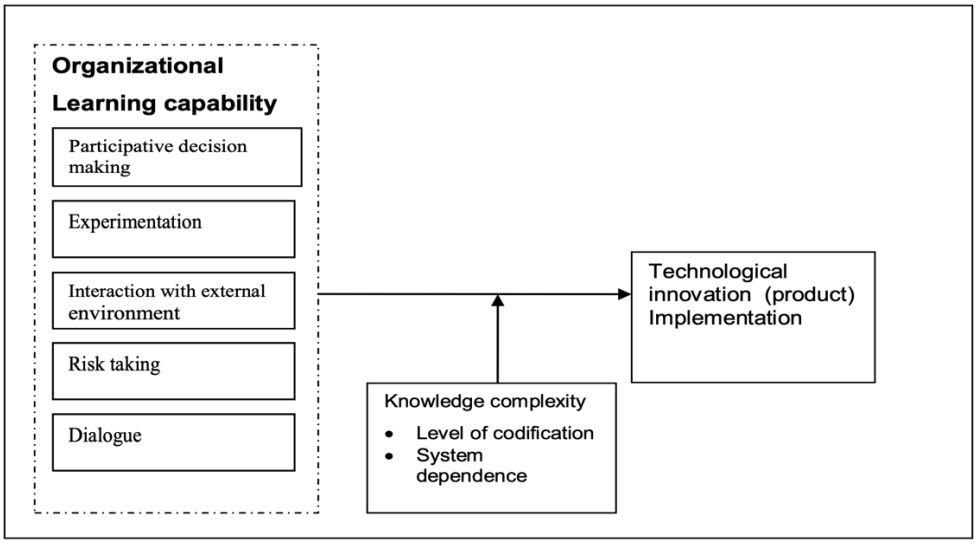

Figure 3. 7: OLC Framework by Mat and Razak (2011)

A summary of the contributions and analysis of each framework is presented in table 3.3.

Table 3. 3: The main highlight of the published OLC frameworks.

Framework	Contribution	Analysis
The Conceptual Model of (OLC) by Chiva et al, (2007)	Proposed and validated a measurement scale capturing the OLC based on a comprehensive analysis of the facilitating factors for learning. Their scale consists of 14 items grouped into five dimensions: experimentation, risk taking, interaction with the external environment, dialogue, and participative decision making.	Framework lists a good number of factors, but it does not suggest how to implement the OLC. Factors do not include technology enablers.
OLC Research Model by Shoid, Kassim and Salleh, (2011)	Proposed a framework that has eight dimensions. These dimensions are (1) System thinking (2) Organizational culture (3) Leadership (4) Information Communication Technology (ICT) (5) Transfer of knowledge (6) Teamwork cooperation (7) Shared vision and mission (8) Employee's skills and competencies. Five are	Framework suggested some enablers. There is a gap as the frameworks still did not show methods of implementing the OLC and using it to improve the organizational performance utilizing the digital enabling technologies which is the purpose of this research. Also, the

	main independent variables: shared vision and mission, organizational culture, teamwork cooperation, transfer of knowledge and ICT. The dependent variable is knowledge performance which has been adopted from the previous models and scholarly literature.	framework mentions ICT but it did not study its impact on OLC or performance.
OLC Framework Khalib, Kassim et al (2015)	Reviewed previous literature working towards developing a conceptual framework linking OLC and the job satisfaction of employees. Based on scholarly literatures (Chiva, 2007; Shamsul, et al, 2011) four main independent variables are identified, namely, organizational culture, leadership, dialogue and participative decision-making; the dependent variable is job satisfaction.	Framework was unique, as it studied employee satisfaction as one of the factors. This factor forms a key score in the balance score card while measuring organizational performance. Framework ignored technology related factors as they were not examined.
Olejniczak and Mazur, (2014)	Proposed a detailed framework which also uses independent and dependent factors (or variables), but is more detailed and divided between Contextual Knowledge, Strategic Knowledge and Operational Knowledge.	Model is highly theoretical and does not reflect the impact of its application on improving the organizational performance. Having said that, it provides a good source of factors and variables that can be further tested. The study did not consider utilising technology or digital enablers.

As an outcome from the previous frameworks, a list of influential factors is presented in table 3.4.

Table 3. 4: Influential Factors of OLC.

Influential Factors/ References		Teamwork, cooperation, and group problem solving	Knowledge sharing	Experimentation	Risk taking	Interaction with the external environment	Dialogue	Participative decision-making	Systems thinking	Leadership commitment and empowerment
1.	Chiva, Alegre and Lapiedra, (2007)			**x**	**x**	**x**	**x**	**x**		
2.	Goh and Ryan, (2002)	**x**	**x**	**x**				**x**		**x**
3.	Deniz, Cimen and Kaya, (2017)			**x**	**x**	**x**	**x**	**x**		
4.	Goh, (2003)	**x**	**x**	**x**	**x**					**x**
5.	Jerez-Gómez, Céspedes-Lorente and Valle-Cabrera, (2005)	**x**	**x**	**x**					**x**	**x**
6.	Mbengue and Sané, (2013)			**x**	**x**	**x**	**x**	**x**		
7.	Gomes and Wojahn, (2017)			**x**	**x**	**x**	**x**	**x**		
8.	Onağ, Tepeci and Başalp, (2014)	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**
9.	Shoid, Kassim and Salleh, (2011)	**x**	**x**	**x**		**x**				
10.	Jerez Gómez, Céspedes Lorente and Valle Cabrera, (2004)		**x**	**x**					**x**	**x**
11.	Leonard-Barton, (1992)	**x**		**x**		**x**			**x**	
12.	Garvin, (1993)		**x**	**x**						
13.	Senge, (2006)	**x**							**x**	**x**
14.	Templeton, Lewis and Snyder, (2002)					**x**	**x**			
Total		**7**	**7**	**12**	**6**	**8**	**6**	**6**	**5**	**6**

Below, the influential factors of the Organizational Learning Capability are described:

- **Teamwork, cooperation, and group problem solving:** Teams are increasingly more important in day-to-day key operations across different levels in the organisation. Hence, the organisations' ability to learn directly depends on the ability of the team to work together, solve problems, and learn (Edmondson, 2002; Senge, 1990). Particularly team working influence learning through three mechanisms: outcome improvement, task mastery and group processes (Edmondson et al., 2007).
- **Knowledge sharing:** By studying the factors that influence organisational learning, Onağ, Tepeci and Başalp, (2014) found that knowledge sharing - the organization's ability to diffuse knowledge - explains about 15 % of differences in learning across firms. Specifically, organisations that develop a strong knowledge sharing usually promote the socialisation of new processes to relevant employees; incentivise a culture where managers are comfortable receiving criticism without becoming overly defensive; and communicate errors and lessons learned through quality circles across multiple levels in the organisation.
- **Experimentation:** Experimentation involves a systematic method for searching and validating new knowledge. Compared to problem solving which uses systemic methods for solving challenges, experimentation is motivated by opportunities; it results from leveraging opportunities, such as new R&D, that may provide better service to customers or expand market opportunities. Experiments are usually conducted in small pilots parallel to the traditional ways of working and should be accompanied by incentives that favour risk taking (Ulrich et al., 1993).
- **Risk Taking:** Innovating and learning goes hand in hand with risk taking because uncertainty surrounds novel solutions. When risk taking is not encouraged, managers and decision makers can feel that is better to maintain the status quo. The 'if it works don't touch it' aphorism illustrate the problem. Yet, without taking risks and embracing the possibility of controlled failure, organisations are unable to learn and hence may be prone to lose performance in the long term (Robert, 2013).
- **Interaction with the external environment:** While employees within a focal organisation create and socialise knowledge, logic dictates that most radical knowledge changes are likely to come from the environment the organisation is in, for example from competitors, governments, or venture capital firms. Consequently, the interaction with the external

environment – or the factors that are beyond the organisational control and influence (Chiva et al., 2007) – is a central influential factor for organisational learning.

- **Dialogue:** Defined as an on-going communication activity to build narratives about the processes, cues, assumptions and experiences of the actors within an organisation (Isaacs, 1993; Schein, 1993), dialogue is a tenet of organisational learning. People enact their daily experiences as they speak and construct narratives to understand what they think. These narratives are socialised and generate action through collective agreement. Furthermore, dialogue also allow the audience (including the speaker) to build mental frameworks to solve problems, which hence affect the diffusion of learning and performance.
- **Participative decision making:** This refers to the level to which employees are involved in decision-making processes (Cotton et al., 1988). The principle behind participative decision making is that when more people are involved in making decisions, the organisation benefit from diminishing information asymmetries that may exist across those taking decisions. That is, everyone brings additional information which help to make decisions as fast and accurate as possible.
- **Systems thinking:** Systems thinking refers to the degree to which the firm is perceived as a system composed of different parts that exchange information and services (Senge, 1990). System thinking requires stablishing common goals and a a common identity to guide the behaviour of the members. It also highlights that the members of an organisation, independently of what area are they in, should collaborate and share knowledge among them.
- **Leadership commitment and empowerment:** Leadership commitment and empowerment refers to the degree to which the mangers of an organisation encourage employees to experiment, share information, take risks, dialogue, and cooperate to launch initiatives and create new knowledge. Furthermore, management, is responsible for articulating the learning strategy, and remove obstacles to ensure long term results (Hult and Ferrell, 1997; Ulrich et al., 1993). Consequently, the level of management commitment affects both directly and indirectly the ability of the organisation to learn.

3.3.5 Relationship between OLC and Organizational Performance; OLC Effect

The significance of training on the organizational learning process is pointed out in numerous studies (e.g., McGill and Slocum, 1993; Ulrich et al., 1993; Nonaka and Takeuchi, 1995; DiBella

et al., 1996). Training programs should not be conceived solely in terms of skills construction that imply immediate improvements in the carrying out of tasks but should rather be contemplated from a wider viewpoint. Training can reinforce the individual's commitment to the organization and its objectives (Huselid, 1995; Ichniowski et al., 1997). Kamoche and Mueller (1998) consider that training should be orientated towards developing a culture of commitment to learning. Thus, training will be able to encourage the constant generation of competences based on knowledge and its dissemination throughout the organization.

From a quality perspective, continuous improvement methods can help design training programs to maximise organisational learning and performance (Antony, 2001, 2006; Kumar et al., 2006). Using continuous improvement methods involves assuming that employees training is not a one-off situation, but rather an ongoing process to achieve both incremental and breakthrough improvements. A continuous improvement approach to training is important because the skills and knowledge to do work shift in response to environmental changes. And so, training programs depreciates, as knowledge becomes less applicable to current scenarios.

Organisations usually overcome this problem by adopting continuous improvement techniques that break training and development into a systematic and iterative learning process. Most common techniques adopted are based on the Assess Design Deliver Evaluate (Moskowitz, 2008), Plan Do Check Act (PDCA), Observe Plan Do Check Act (OPDCA), Define Measure Analyse Improve Control (DMAIC), and Design for Six Sigma (DFSS) (Sokovic et al., 2010). Despite the differences in naming, all these iterative design processes exhibit some commonalities. First, they leverage the scientific method to test hypothesis according to specified performance criteria. Second, they refine and repeat the scientific method multiple times to create small changes and maximise performance (Moen and Norman, 2006; Taylor et al., 2014). Such processes – or meta routines in the behaviouralist parlance - help organisations to curate goals in response to past performance, and adapt to the environment (Cyert and March, 1963). Thus, may has argued that adopting an iterative design process may help organisations to outperform competitors both in the short and long term. Literature exploring the adoption in practice of such methodologies, however, document that while the PDCA model is widely used, in practice, there is a lack of adherence to small scale changes, and organisations fail at tracking the evolution of such changes – a situation that difficult the realisation of the PDCA benefits in practice (Taylor et al., 2014). Nevertheless, digital technologies present an opportunity to bridge the gap between the concept and adoption;

those organisations leveraging digital platforms can capture micro interactions across the improvement process, track progress and correct the course accordingly.

Researchers have begun to concentrate on the definition of organizational learning, the dimensions of organizational learning and how to develop the organizational learning capacity, because recent studies have found organizational learning to be a key factor in firm performance. (Jerez Gómez 2004), Most of these researchers have defined organizational learning as detecting error and fixing processes. In addition, organizational learning capacity has been described as the improvement of firm performance over time.

The impact of the knowledge economy on today's businesses has prompted a growing recognition among the companies' top management about the need to cultivate organizational learning and innovative properties. Hence, both innovations have been considered as a critical issue for company performance and survival in the competitive environment and learning became a key activity for organization development and innovation. In the literature, it is accepted that organizational learning has been linked to innovation and firm performance. For example, Fang et al (2011) argue that *"organizational learning capabilities are positively and significantly related to organizational innovation"*. This notion is supported by the literature on absorptive capacity, which argue that the firm's ability to recognise value in internal and external information is core to innovation. (Cohen and Levinthal, 1990; Naqshbandi and Tabche, 2018; Todorova and Durisin, 2007). Müller et al (2021), for example, document that the acquisition and assimilation of knowledge from the environment enable both SME and large organisations to pursue exploration and exploitation strategies, which benefit short and long term performance respectively.

Akgun et al, (2014), explores the relationship between OLC and firm performance organizations that embrace strategies consistent with the learning organization which are thought to achieve improved firm performance. Ellinger et al (2002) and Calantone et al (2002), argued that OLC establishes a mechanism through which coordination and combination of resources and capabilities is achieved, decreasing time and cost of identifying market needs, satisfying customer requirements and responding to changes in the environment by added value (Prieto and Revilla, 2006).

According to Baker and Sinkula (1999) the direct influences of organizational learning can be listed as; (1) the promotion of generative learning as a core competency as a result of knowledge creation, (2) the questioning of long held assumptions such as to always follow market-oriented strategy, instead of trying to lead the market with new product development strategy for instance,

(3) the realization that customer satisfaction cannot always be maximized with customer feedback mechanisms but innovative disruptions are needed.

Also, OLC promotes managers to focus on specific interventions required to develop learning such as training, seminars, weekly meetings, team works, collaborative projects to clearly articulate the mission, vision and goals of the organization (Goh, 2003). This way, OLC encourages the creation of a shared vision among employees and facilitates the understanding of the gap between the current stage and vision of the organization, hence it leads to an increased effort for productivity.

In a nutshell, the OLC contributes to:

- Detecting errors by learning from experience.
- Fixing and standardising processes.
- Saving time using a common model in order to transmit knowledge.
- Through encouraging the creation of a shared vision among employees, thereby increasing effort put into productivity.
- Job satisfaction.
- Reinforces commitment of individuals to the organization and its objectives.

3.3.6 The current challenges of implementing OLC in public service organizations

Mosiane-Lentsoe (2000) in a DAdmin thesis entitled "Effecting organization change in Eskom by creating a learning environment" stated that "often organizations fail to make the connection between learning and training". Three critical issues should exist to have a learning environment: individual, team and organizational learning. Having listed the five elements of a learning organization (personal mastery, systems thinking, shared vision, team learning and mental models), Mosiane-Lentsoe stressed that these elements represent basic requirements to have a learning organization. On the other hand, the author highlighted the relationship between "change" and between "learning", and stated that difficulties for achieving the learning organization include: "the absence of immediate tangible benefits that organizational learning can provide. The other difficulty could be in translating the theory into practice in the absence of explaining the process sequentially".

The US Army Corps Engineers (2003), in their publication "Learning Organization Doctrine: Roadmap for Transformation" also highlighted the relationship between learning as a base for the need to change and between their critical role across time "Organizations that endure

over time adapt by preparing for the future. The Corps of Engineers is over 225 years old, and to adapt for our future, we must continuously learn from our work today. We have done this in our past. Yet today the rate of change is greater than ever. Accordingly, we must learn faster than ever before. We must develop a new cultural approach to our business and to learning. In this way, we will evolve with the needs of the nation, and we will improve our competence as an organization".

Table 3.5 reflects some of the key studies discussed the obstacles and challenges of implementing OLC in organizations.

Table 3. 5: Current challenges of implementing OLC in organizations.

	Reference/Challenges in implementing OLC	Lack of leadership support/ Lack of management support and commitment	Lack of Org culture of learning	Organizational amnesia	Bureaucracy
1	Jerez-Gómez, Céspedes-Lorente and Valle-Cabrera, (2005)	**x**			
2	Jones and George, (1998)			**x**	
3	Imamoglu *et al.*, (2016)	**x**			
4	(Gonzalez and de Melo, 2018)	**x**	**x**		
5	Garvin, (1993)	**x**			
6	Pemberton and Stonehouse, (2000)		**x**		
7	Song, Joo and Chermack, (2009)		**x**		
8	Watkins and Marsick, (1993)		**x**		
9	Argyris and Schön, (1978)		**x**		
10	(Orth and Schuldis, 2021)		**x**		
11	Guinot, Chiva and Mallén, (2015)	**x**			
12	Kransdorff, (1998)			**x**	
13	Senge, (2006)				**x**
14	Lin and Kunnathur, (2019)		**x**	**x**	
15	Jamali et al., (2006).				**x**
	Total	**5**	**7**	**3**	**2**

- **Lack of Leadership support/ lack of management support and commitment:** Theory on process improvement and organisational change highlights that organisational learning must follow a top-down approach and should be sponsored by a top manager. Realising this in practice, however, remains a key challenge for organisational learning (Mallén et al., 2015). The lack of managerial support may result from the organisation's exclusive focus on financial results, which promote the exploitation of current systems and so, hinder the exploration of new solutions. Managers thus inhibit learning and change fearing that

new initiatives may backslash and jeopardises quarterly results. – High cost of learning programs and allocating money to the program

- **Lack of organisational culture of learning:** A learning culture is defined by the values that shape the behaviours and thoughts of employees regarding how to innovate, create new knowledge and learn (Naqshbandi and Tabche, 2018). The learning culture remain a key challenge for organisational learning (Islam et al., 2014; Naqshbandi and Tabche, 2018). For while many organisations describe their cultures with values that promote learning in theory, there is a disconnection between the values in the paper and the values by which employees behave and think at work. Such challenge highlights the need for mechanisms that change the cognitive structures of those working within and organisation (Corfield and Paton, 2016). Finally, a key dimension that characterise the lack of organisational learning culture is the lack of willingness to share – in this context, to share knowledge, experience, triumphs, and lessons learnt. Such lack of willingness to share diminishes the likelihood of activating Crossan et al., (1999) mechanisms, and so deteriorates organizational learning.
- **Organisational Amnesia:** Described as the inability to remember what a company did, why it did it and what where the outcomes, organisational amnesia poses a challenge to organisational learning (Kransdorf, 1998). Organisational amnesia occurs when the firm is unable make the necessary changes for learning to take place. Particularly, building upon Crossan et al (1999) work that describe learning in terms of four mechanisms (i.e., intuiting, interpreting, integrating, and institutionalising), organisational amnesia results when the organisation fails to integrate and institutionalise learning (Othman and Hashim, 2004). First, regarding the challenges that prevent the integration of learning across the firm, organisational amnesia may result from a lack of cooperation across departments whereby the lessons learned, and new knowledge remain siloed within functions or small groups. Second, regarding the challenges to institutional learning, organisational amnesia may result from a managerial failure to capture and create new procedures to make sure that learning take place across the firm.
- **Bureaucracy:** Bureaucratic organisations exhibit characteristics that inhibit learning; they are hierarchical, remove empowerment, promote behavioural control and are rigid. Thus, bureaucracy pose a key challenge for the learning organisation (Senge, 1990), and decouples strategy and execution. Learning organisations must adapt new structures that

promote learning by creating flatter structures that empower people, support teamwork, promote trust, communication, commitment and flexibility (Jamali et al., 2006).

Based on the previous analysis, this investigation considers six challenges/sub-challenges to organisational learning, to know: lack of leadership support, high cost of learning programs, lack of learning culture, lack of willingness to share, organisational amnesia because of low cooperation across departments, and bureaucracy. These challenges have been used in the field study as a barrier of learning in organizations – refer to Figure 4.4.

3.4 The Digital Age: Relevance and implications for organizational learning capability

In the last decade, the world have seen an explosion of digital innovations enabled by progress in infrastructural technologies, algorithms and the emergence of a new generation of digital savvies. Such digital innovation has profound implications for corporate management (Noruzy et al., 2013; Camisón and Villar-López, 2014; Ylijoki and Porras, 2016; Schweitzer, Handrich and Heidenreich, 2018; Khin and Ho, 2019; Szalavetz, 2019). For instance, researchers have found that digital orientation (described as the management ability and will to acquire substantial technological background to develop new products/services) and learning capabilities have a positive effect on the innovation and can boost the firm's performance (Noruzy et al., 2013; Khin and Ho, 2019). Specifically, digital transformation benefits corporate's performance through three mechanisms, improving structural performance (cost-related efficiency gains), enhancing relational performance (collaboration quality across different teams) and promoting new product development performance (Schweitzer, Handrich and Heidenreich, 2018). Scholars have also noted that the benefits on performance are only achieved if the appropriate conditions exist. These conditions include having an integrated development environment and other tactics to reduce the risk related to the decentralisation of innovation practices (Szalavetz, 2019).

Similarly, scholars have found that the appropriation of emergent technologies such as big data analytics support organization performance by enabling the company to achieve the dynamic capabilities (Wamba et al., 2017). For instance, the use of social media can leverage the organization's sensing, seizing and reconfiguration dynamic capabilities, aligning resources with customers and thus, appropriate value (Mention, Barlatier and Josserand, 2019). Thus, on a broad sense, digital technologies and innovation helps organizations to realise the so-called dynamic

capabilities (for a further description of dynamic capabilities please see Teece, Pisano and Shuen, 1997; Teece, 2007; 2014).

In the case of personal and professional development programs, scholars have found that the use of digital platforms for education can reshape and benefit multiple dimensions of those programs (Zulfikar et al., 2018; Sánchez et al., 2019). Particularly, digital transformation processes impact (1) the ease of access to information and knowledge (Zulfikar et al., 2018), (2) the emergence of a massive open online course (MOOC) (Zulfikar et al., 2018), (3) the integration with industry (Zulfikar et al., 2018), (4) the global mobility of students (Zulfikar et al., 2018; Sánchez et al., 2019) (5) the competitive landscape (Zulfikar et al., 2018), (6) the objectivity of assessment (Sánchez et al., 2019), and (7) the time dedicated per instructor (Sánchez et al., 2019).

For these digital technologies to bring the aforementioned benefits and obtain a superior performance, organizations need to build the right internal conditions, align digital innovation with corporate goals, acquire and foster the right organizational culture and build the talent/roles with the right skills on the effective appropriation of digital instruments (Caputo et al., 2019; Vial, 2019). These conditions can be strategic, such as getting the buy-in of the leadership to orchestrate and connect benefits from digital technologies with the corporate objectives (Muninger, Hammedi and Mahr, 2019; Vial, 2019); or executional, such as the adoption of agile methodologies for supporting experimentation and rapid iterations (Dremel et al., 2017; Muninger, Hammedi and Mahr, 2019).

Thus, digital innovation and transformation needs a change in the static nature of strategy towards a more dynamic and iterative model. Traditionally, researchers have thought about the formulation of digital strategy as a planned static process. For example, after studying 20 manufacturing and logistics companies in Singapore, researchers proposed that digital strategy is achieved through (1), assessment of current business model, (2) design of a business model, (3) assessment of current digital capabilities (based on the second and third steps), (4) identification of future digital capabilities (5) and development of an action plan. (Ng, Tan and Lim, 2018). Contrasting with the traditional view of strategy, a recent study of the digital transformation at a financial service company using the strategy as practice lenses (Vaara and Whittington, 2012), researchers have found that digital strategy making is an on-going iterative process between learning and doing. This notion gives digital innovation strategy a more emergent, transient, and moving target flavour, implying the need for creating organizational mechanisms to continuously incorporate new learnings. Such mechanisms could include the creation of cross-functional teams,

and the need for a balancing top-down and bottom-up strategy convergence (Chanias, Myers and Hess, 2019).

The execution conditions range from establishing the right type of project management methodologies to forming an ecosystem of complementary capabilities and nurturing the right culture. For instance, from analysing the big data analytics capability at Audi AG, researchers recommended developing analytics and evidence-based capabilities at different levels of the organization (Dremel et al., 2017). In practice, this can be accomplished through the analytics translation roles, who are actors that can bridge the analytics insights with the managerial expertise (Henke, Levine and Mcinerney, 2018). Another recommendation from the study was restructuring the organization to match the requirements of the digital age, including having groups transversal to the business functions to leverage and share data (Dremel et al., 2017; Gust et al., 2017), adopt agile methodologies to support reiteration process (Dremel et al., 2017; Gust et al., 2017), and have a centralised IT team to support the company's digital initiatives (Dremel et al., 2017) that look after having integrated platforms instead of isolated tools (Gust et al., 2017).

In practice, organizations that are transitioning from traditional operation models towards incorporating digital solutions must overcome impediments that arise from corporate inertia. Although it has not been researched for large organizations, researchers have analyzed how SMEs with no digital experience were able to drive digital transformation and digital entrepreneurship (Li et al., 2018). They found that to bridge the lack of digital expertise, organizations benefit from (1) the support of a digital platform provider, (2) the renewal of its managerial cognition (Li et al., 2018) to ensure that there are the learning mechanisms to support the transformation and change management (Lei, Slocum and Pitts, 1999), (3) the development of managerial social network (4) the promotion of cross-functional team building, (5) and the improvement of the organising capabilities (Li et al., 2018).

Recognising the role of internal barriers and enablers, to achieve such strategic renewal of business models, culture and collaborative approaches, it is beneficial to adopt a set of operational practices. Those include digital scouting, digital scenario planning, digital mindset crafting support digital sensing, rapid prototyping, balancing digital portfolios a strategic agility support digital seizing, navigating innovation ecosystems, redesigning internal structures and improving digital maturity support digital transforming (Warner and Wäger, 2019). However, these practices might not be complete, since the model underestimates the role of external factors, such as regulations (e.g. data protection) play in achieving benefits from digital transformation. Thus, adoption model

needs to incorporate practices that account for overcoming not only internal factors but also external ones, ensuring that the organization operation is compliant with the industrial standards and government regulations.

Although digital transformation is viewed as a way of improving organizational performance, scholars have mentioned that in the realm of innovation and entrepreneurship, there is still a lack of understanding of openness, affordances and generativity. The theme of openness deals with questions such as how the introduction of new technologies facilitates or impede openness. Furthermore, it is concerned with areas such as which actors can participate, how can they contribute and to what end. The key subthemes are actors, inputs, outputs and processes (Nambisan, Wright and Feldman, 2019). The second theme is affordances, or the possibilities of use offered by an object (Nambisan, Wright and Feldman, 2019). Finally, another understudied theme is about generativity or the capacity to produce unprompted change (Nambisan, Wright and Feldman, 2019). This theme is intended at understanding the implications for society, externalities and the consequences for regulatory regimes.

3.5 Research Gap

The following are the identified four research gaps in the current academic literature about organizational learning: -

1. There is not a well-agreed definition of Organizational Learning Capability (OLC).
2. There is a lack of study to compile and compare all the factors affecting OLC. Some studies explore OLC influential factors, yet the selection of those factors remains arbitrary.
3. There is a need for a comprehensive model in order to help public organizations to introduce and implement OLC in effective manner. Complementary, studies lack correspondence performance instruments to measure the impact of OLC.
4. There is a lack of study of the transformation of the traditional OLC into a digital solution using enabling technologies.

Chapter 4: The Sector Perspective of Organizational Learning Capability

4.1 Introduction

The field study is conducted to gain an understanding about the learning practices in public organizations, also measuring the impact of both individual learning and organizational learning on the organization. These insights are intended to help the research to develop a model that encourages learning culture activities in public service organization utilising digital technology in order to enhance the performance and service offering.

The author attempted to gather qualitative data from real-life practices using structured interviews. A sample of global public sector organizations took part in this field study. The author distributed a semi-structured questionnaire to key relevant people in those organizations. The investigation was done via:

- Telephonic and video conferencing facilities
- Face to face

The questionnaire was designed based on the findings of the reviewed literature presented in chapter 3 covering the following: -

1. Learning processes in public service organizations.
2. OLC Enablers.
3. Influential factors on learning processes.
4. Digital enabling technology.

Table 4.1 summarizes the relations between the designed questions and the findings of the literature review in Chapter 3.

Table 4. 1: **The questionnaire development.**

	The Questions	The Source in the literature review	The Aim
1. Learning process in public organizations	1. Which terminologies are in use within the organization?	Different terminologies are identified in Section 3.3.1.	To investigate the understanding of the terminologies within the organization in order to cover the aspect in the proposed OLC model.
	2. Which of the following tasks do you perform at your training department?	The learning process has been adopted based on the continues improvement process (Plan-Design-Deliver-Evaluate), which is identified in Section 3.3.5.	To identify the stages of the learning processes from the point of view of different public service organizations.
	3. Which learning programs are in practice in the organization?	Different learning programs are identified in Table 3.1 Section 3.2.3.	Identifying learning programs to be used as sub-models of the proposed OLC model presented in chapter 5.
	4. What is the top barrier to learning in your organization?	The barriers of learning in organizations have been addressed based on the analysis of the challenges of implementing OLC in organizations proposed in Table 3.5 Section 3.3.6.	Identify the challenges of learning in public service organizations in order to address it in the proposed OLC model.
2. OLC Enablers	5. Which of the following are important enablers for learning in your organization?	List of OLC enablers have been identified based on discussion of the OLC enabler presented in Table 3.2 Section 3.3.3.	Identify the important enablers to be addressed in the proposed OLC model.
3. The influential factors	6. Which factors have an influence on learning processes?	List of influential factors that affect learning has been identified from different OLC frameworks in section 3.3.4 and listed in Table 3.4.	Identify the factors that influence learning process in public service organizations to be addressed in the proposed OLC model.
4. The digital enablers	7. Which of the following challenges do you face in implementing digital technology in your learning processes?	The challenges are based on the outcome of section 3.4 The digital age.	Identify the challenges of implementing digital technology in learning in public service organizations in order to address it in the proposed OLC model.

4.2 The Sample

The field study was conducted in 30 public service organizations in seven countries: the U.A.E., the U.K., France, Poland, Norway, Spain and Finland.

Participants were selected using a technique similar to maximum variation sampling; the respondents were purposively selected by the researcher from a list of public organizations. The respondents were specifically targeted in order to gain as accurate and qualitative input as possible. The sample represents employees in mid-management in the following sectors:

- Healthcare: hospital, general practitioner, head of the statistics department.
- Education: university teacher, primary school teacher.
- Social care: head of teams of counsellors, learning and development consultant.

- Local authorities & law enforcement: police officers, superintendent, intervention team leader.

Table 4.2 shows details of the participants and their organizations.

Table 4. 2: Field study participants

	Business Sector	Country	Position	Industry Experience (years)
1	Police Force	Spain	Caporal	14
2	Police Force	Spain	Guardia Civil	30
3	Police Force	France	Officer	36
4	Police Force	Finland	Head of education	25
5	Police Force	Norway	Head of studies	30
6	Police Force	France	Super intendant	18
7	Police Force	UAE	Head of strategic planning	16
8	Police Force	UAE	Head of smart city centre	11
9	Law Enforcement	UAE	Head of planning of training section	8
10	Law Enforcement	UAE	Head scholarship section	15
11	Law Enforcement	UAE	Quality Advisor	16
12	Healthcare	Poland	Education Solutions Lead	10
13	Healthcare	France	GP	40
14	Healthcare	UK	Head of Practice Education	22
15	Healthcare	France	Head of the statistics department	10
16	Healthcare	UAE	GP	14
17	Healthcare	UAE	Department head	10
18	Healthcare	UAE	Department head	10
19	Healthcare	UAE	Specialist doctor	8
20	Healthcare	UAE	Specialist doctor	18
21	Governmental Agency	France	Consultant on Training	8
22	Education	Poland	Head of the Primary School	35
23	Education	France	Certified French teacher	24
24	Education	Poland	Vice-rector	20
25	Education	Poland	Head of Regional Methodological and Educational Centre	20
26	Education	Spain	Teacher	12
27	Education	Spain	Subdirector /Teacher	32
28	Education	France	Teacher	20
29	Education	France	University professor	35
30	Education	UAE	Faculty Heading	25
31	Education	UAE	Teacher	15
32	Education	UAE	Teacher	17
33	Council	UK	Learning & Development Consultant	30
34	Governmental Agency	Poland	Head of Training	10
35	Governmental Agency	Spain	Responsable de Formación	6
36	Governmental Agency	France	Training manager	8
37	Security	France	Human Resources	10

4.3 **Data analysis and results**

The author rated organizations using a 1-5 Likert scale where higher scores indicate greater effectiveness and/or adoption on 4 areas: learning processes, enablers, facilitating factors, and challenges in adopting digitally enabled learning processes. The same measurement applied to the frequency wherever it occurred. Data were filtered to include only inputs with an average effectiveness above 3. The following are the questions asked and the analysis of the results:

1. Which terminologies are in use within the Organization?

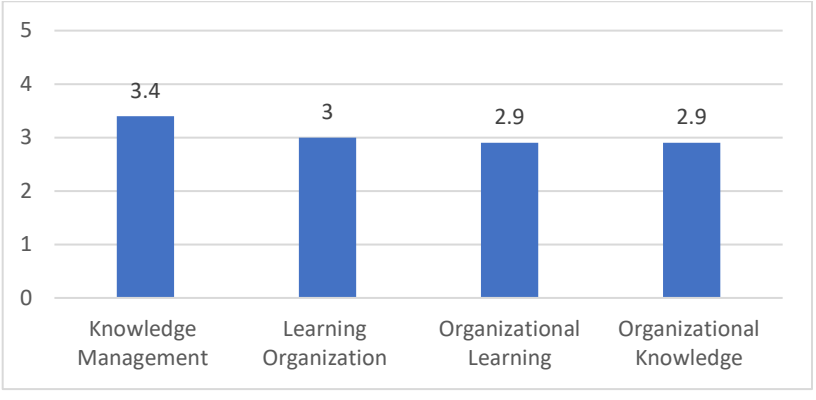

Figure 4. 1: Terminologies in use within organizations.

On the question about terminologies used within the organization, the main terminologies identified were: Organizational Learning, Learning organization, organizational knowledge and knowledge management. Figure 4.1 reflects the importance of learning and knowledge within the public organizations. There was also some confusion using the terms as they are used interchangeably.

2. Which of the following tasks do you perform at your training department?

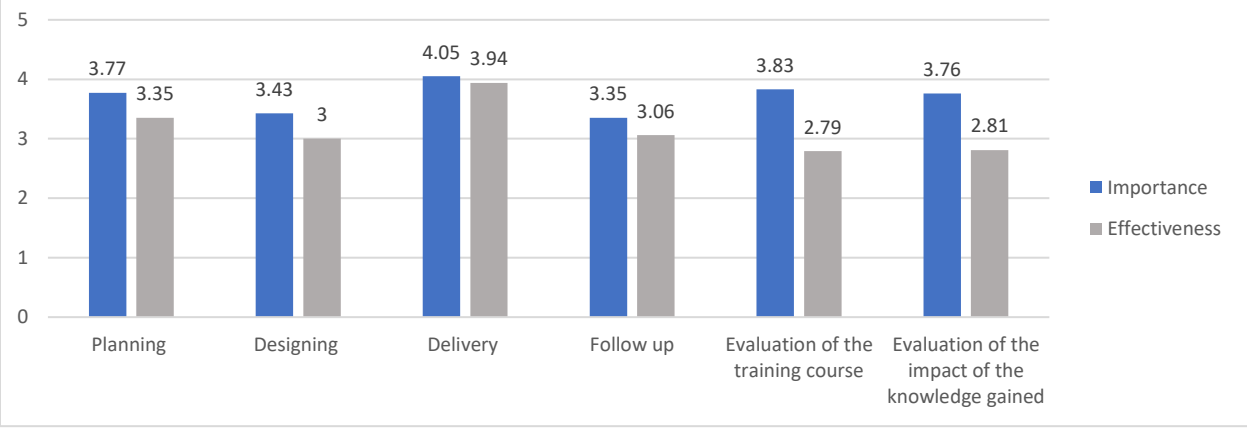

Figure 4. 2: Tasks performed at the training department.

Figure 4.2 shows that public service organizations are performing all the stages of the learning process. Although organizations are performing all the required tasks of the learning

process, they have the opportunity to improve the effectiveness of the current practices of each task. Evaluation of the learning programs and the evaluation of the gained knowledge stages are less effective, which should be considered and explained in detail in the final model.

3. **Which learning programs are in practice in the organization?**

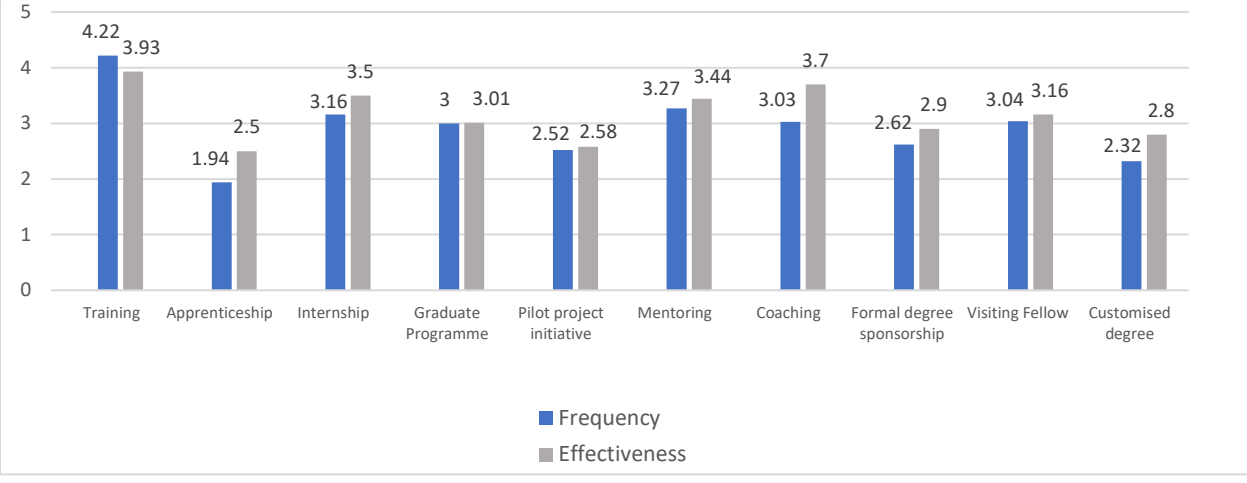

Figure 4. 3: Learning programs in use in the organization.

The interviewees were asked about the frequent use of the identified learning programs and their opinion about the effectiveness of the identified learning programs. Figure 4.3 shows the results where training is perceived as the most frequently used way to enhance skills as it is the traditional approach, while formal degree sponsorship does not seem to be in frequent use, contrary to apprenticeship which is used a lot in manufacturing, and it is not popular in public service organizations. Coaching, mentoring and internships were perceived as effective and appreciated by public organizations.

Despite the fact that classroom training is the most used method, being one of the earliest and most basic methods, the interviewee believes that a digitalised model can enhance the traditional training to improve efficiency and promote higher levels of performance. Whilst coaching is not highly used, it is perceived to be one of the highest and most effective methods. The model derived and proposed should include the most effective rather than the most currently used methods.

4. What is the top barrier to learning in your organization?

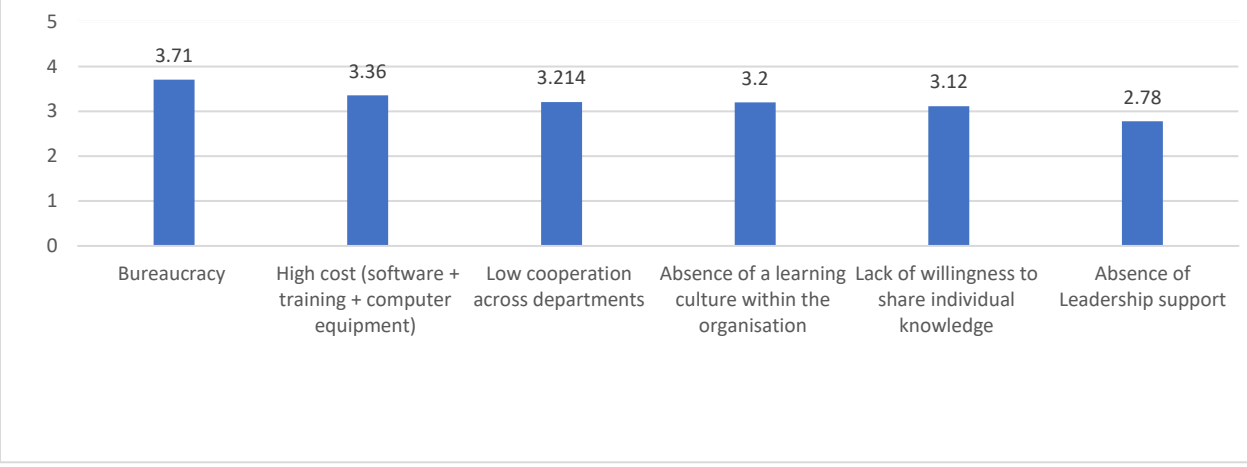

Figure 4. 4: Top barriers to learning

According to the results shown in Figure 4.4, participating organizations have barriers (i.e., challenges) that affect learning within the organizations. Bureaucracy is the most prevalent barrier as interviewees believe that complex operational procedures affect learning in the organizations. For example, employees face difficulties in selecting the learning programs needed for each employee and applying what they have learned in their daily work. Also, high costs of implementing new learning programs are found as a barrier because the organizations do not have their own platforms for digital learning programs. Furthermore, low cooperation across departments, absence of learning culture within the organization and the lack of willingness to share individual knowledge has been stated as barriers which shows a need to insert knowledge sharing aspects in organization's strategies, procedures and policies. Although, leadership support is a very important element for learning with the organizations, interviewees believe that the current leadership are aware of the importance of learning, but they need to be enhanced in this area. All the barriers will be addressed in the OLC model proposed in this thesis.

5. Which of the following are important enablers for learning in your organization?

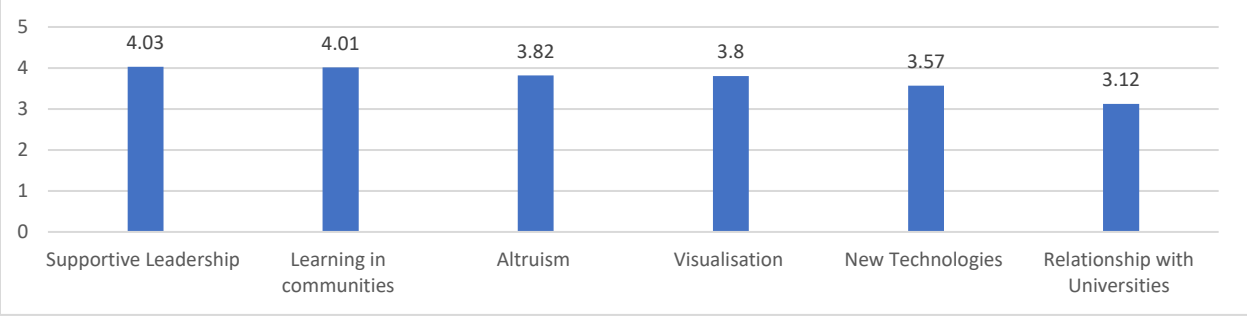

Figure 4. 5: The importance of the learning enablers within the organizations.

To implement any learning process within an organization, some enablers should be imbedded within the organizations. A list of enablers has been identified from the literature review in Table 3.2 Section 3.3.3 Chapter 3 which may help to create the best environment for learning within any organization. Figure 4.5 shows that all the mentioned enablers are important for learning within the organization. It is the role of the top management to facilitate these enablers in order to have effective learning programs which enhance the skills of the employees and improve service offering. All the enablers should be covered in the model proposed in this thesis to maximise learning within the organizations.

6. Which factors have an influence on learning processes?

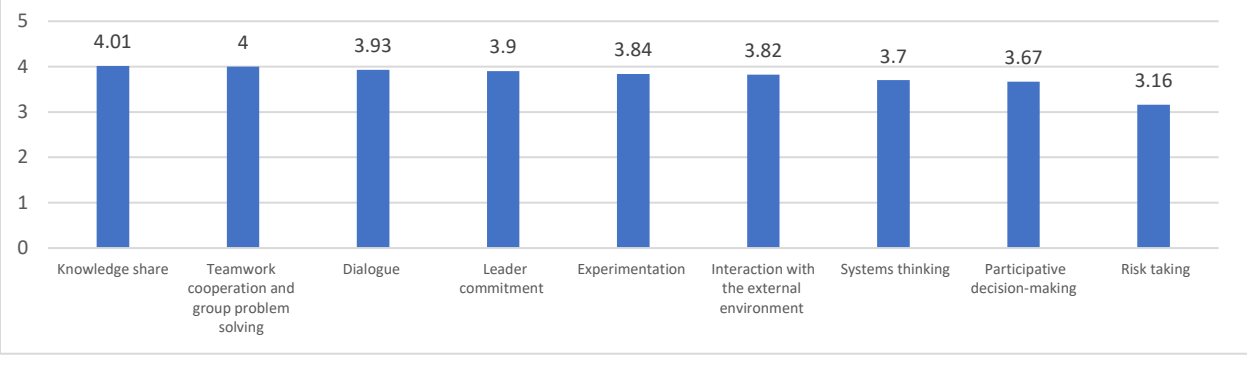

Figure 4. 6: Factors that influence the learning process.

The influential factors have been the focus of many studies. This study focuses on identifying factors affecting the learning process. Those factors affect different stages of the learning process. The OLC model should include influential factors to produce a comprehensive model. The author collected data based on the influential factors captured from the literature review in Table 3.4 Section 3.3.4 Chapter 3.

Figure 4.6 summarises the key learning facilitating factors in the public sector ranked by importance according to the interviewees. From the interviewee's point of view, knowledge

sharing, and teamwork cooperation were the most important factors that influence the activities of the learning process. However, all the factors were important as they score above 3. These factors are important to support the execution of the different activities of the defined learning process. All the factors will be covered in the OLC proposed model.

7. **Which of the following challenges do you face in implementing digital technology in your learning processes?**

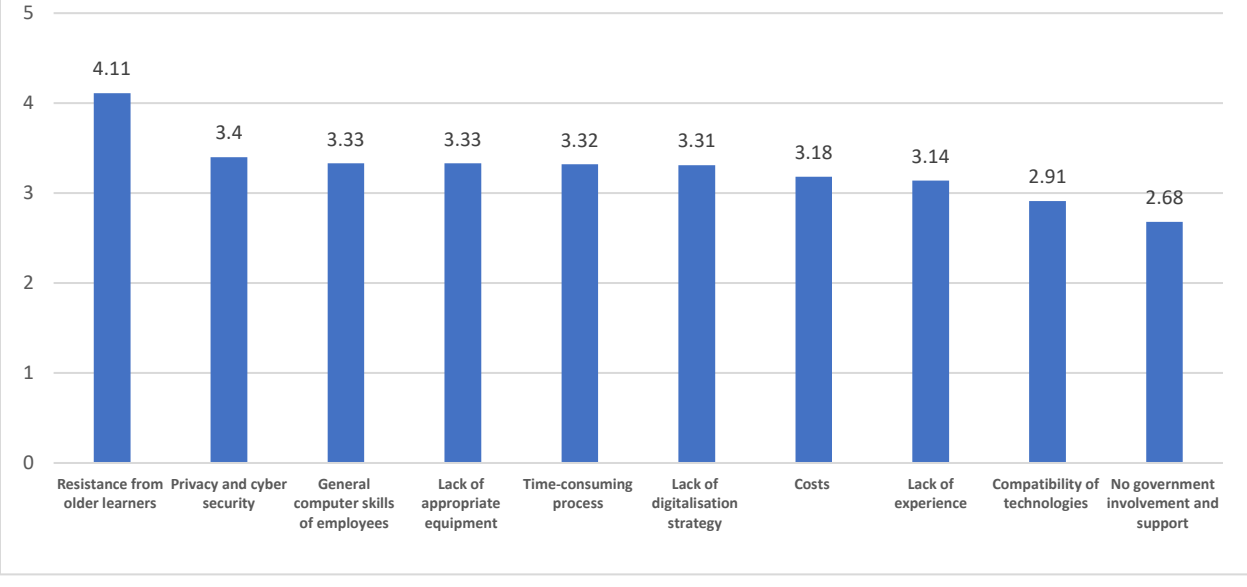

Figure 4. 7: Challenges in implementing digital technologies.

Finally, in this last section, the researcher tried to build an understanding of views of the employees working in a public sector in relation to digitalisation. It is important to know how they perceive digitalisation and what their attitudes are towards the changes dictated by digitalising the learning process or at least parts of it.

Interviewees discussed the role of digital technologies in enabling the implementation of learning programs. Virtual learning environments and business games supported learning in public organizations, particularly when they are accessed through different devices (e.g. smart phones and tablets). However, several challenges emerge from implementing these digital technologies as shown in Figure 4.7, including the adoption resistance from older employees and concerns over privacy and cyber security. The analysis shows the importance of creating an organizational capability to reap benefits from digital technologies: from improving the employee's digital skills to facilitate access to specifying the right structures to monitor execution of learning.

Since the results clearly support digitalisation, the researcher is using it as the general umbrella for the proposed OLC model, where the learning process is going to be revamped using digitalised methods and new technologies that are suitable for the organizations.

4.5 Toward developing OLC model based on the field study data

This chapter shed light on the elements of learning in organizations and built more practical results based on real life practices in public service organizations. Despite the fact that organizations might be following non ideal practices, the interviewees saw more significance in less currently used methods. This in turn encouraged the researcher to produce a more unique model that is based on most significant rather than most used methods and common practices of learning within public service organizations. Table 4.3 summarizes the main outcome of the data analysis of each question and how that is used to develop the OLC model presented in Chapter 5.

Table 4. 3: **The field study outcomes summary**

	The Questions	The Outcome
1. Learning process in public organizations	1. Which terminologies are in use within the organization?	The results show a need for a clear OLC model to be implemented within the public service organizations.
	2. Which of the following tasks do you perform at your training department?	Each learning program needs the following tasks: 1. Plan. 2. Design. 3. Deliver. 4. Impact evaluation. Therefore, the proposed OLC model and its sub-models should have a learning process with the identified tasks.
	3. Which learning programs are in practice in the organization?	Public service organizations are using different learning programs. Therefore, an effective OLC model should support a range of the identified learning programs.
	4. What is the top barrier to learning in your organization?	All the barriers will be addressed in the proposed OLC model in order facilitate the implementations of the OLC within the organizations.
2. The Enablers of OLC	5. Which of the following are important enablers for learning in your organization?	The results show that all the identified enablers are important for learning in public service organizations. Therefore, these enablers will be employed to facilitate the learning activities within the organizations.
3. The influential factors	6. Which factors have an influence on learning processes?	The results show that all the identified factors have influence on the learning process. Therefore, all the influential factors will be addressed in detail in the proposed model, as they affect different tasks of the learning process.
4. The digital enablers	7. Which of the following challenges do you face in implementing digital technology in your learning processes?	The OLC model will consider addressing all the identified challenges concerning implementing digital technology.

Chapter 5: The Organizational Learning Capability Model

5.1 Introduction

This chapter covers the organizational learning capability model which represents one of the main contributions of this research. The OLC model consists of three main elements: the learning process, influential factors, and the enabler. The OLC model presents a process for public sector organizations to learn via different stages with several tasks in each stage. The model shows several key influential factors that should be taken into account to ensure the effectiveness of the learning process tasks. Several enablers have also been captured to facilitate an effective application of the learning in the organization. Previous knowledge and experiences are going to be used to support the identification of any knowledge gaps in the employee's skills and supporting the defined new learning process.

5.2 Organizational learning capability model

The OLC model encapsulates elements which were discussed in the literature review in Chapter 3 and endorsed via the sector's perspectives (generated from questionnaires and semi-structured interviews) in Chapter 4. The proposed OLC model is a graphical representation of the OLC definition which is to say that "OLC is the facilitation of a process to ensure that the organization is learning from its operations and experiences of different projects and initiatives. This learning process is influenced by certain factors that are directly related to the performance of both employees and service provision." (Moghadam 2013, Bruining 2009, Alegre and Chiva,2008).

The OLC model shown in figure 5.1 consists of three main elements:

1. Learning processes
2. Enablers
3. Influential factors

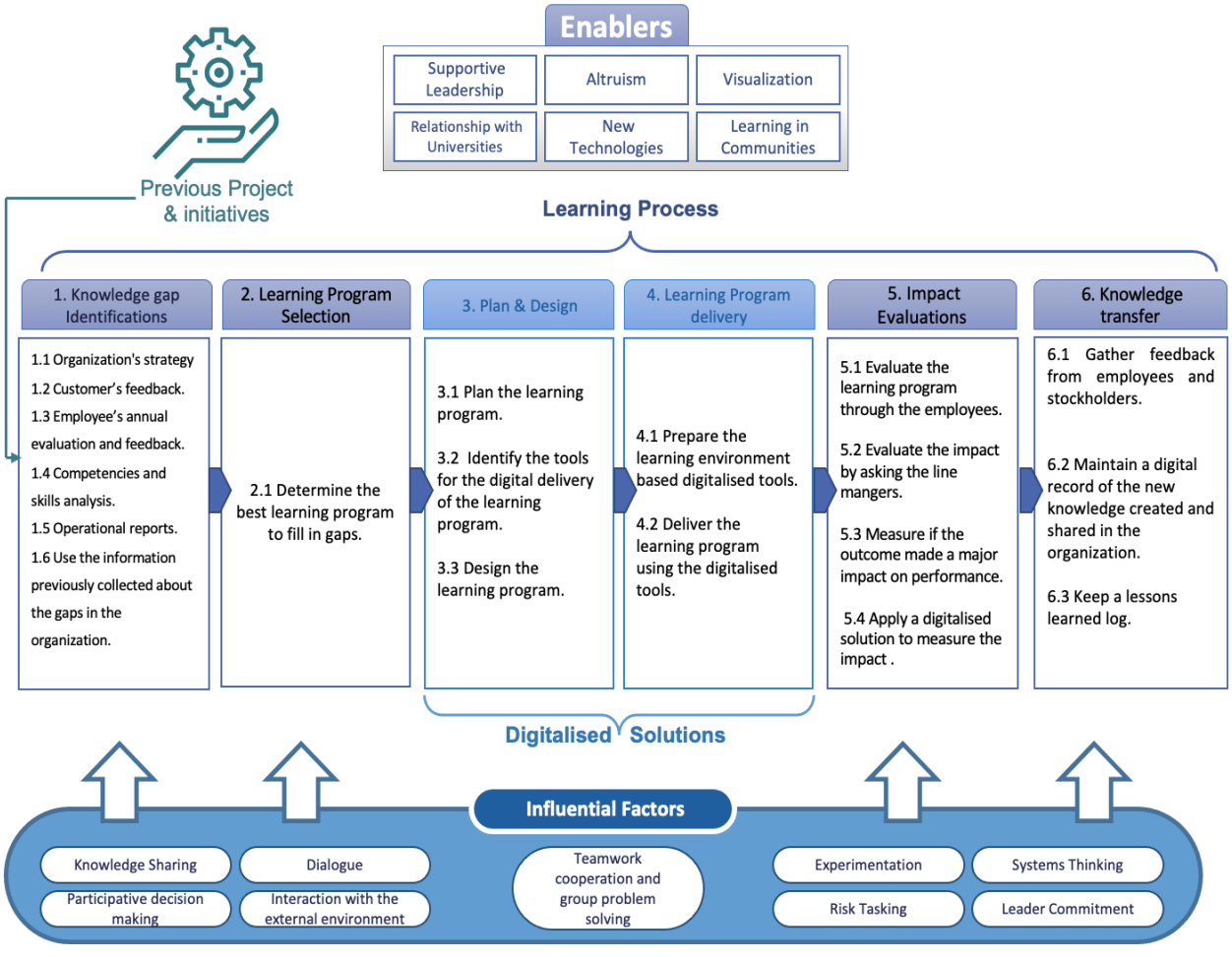

Figure 5. 1:The Organizational Learning Capability model.

5.2.1 Learning Process

The learning process consists of six stages where each stage contains several tasks. The six stages of the learning process have been identified based on the data analysis in Section 4.3 Figure 4.2. Each stage consists of a several tasks in order to guide the organizations in having an accurate and smooth implementation learning process of OLC model. These tasks have been designed based on the author's experience with learning programs in public service organizations as well as the overall understanding of the literature review presented in Chapter 3. The following paragraphs present, in detail, the six stages of the learning process and their tasks.

5.2.1.1 Knowledge Gap Identifications

Knowledge gap identification is the first stage in the learning process. The purpose of gap analysis is to determine the gap between performance standards and an employee's skill/performance level. Gap Analysis normally focuses on the following perspectives:

1. **Organization's strategy**

   Organizational direction and strategy analysis: for example, is there a gap between our current plans and our strategy? When conducting gap analysis, the learning and development strategy should be aligned with the organizational strategy in general, the learning strategy should be aligned with the general (Senge, 1990). Any gaps should be identified and considered as improvement input for the future.

2. **Customers Feedback**

   The purpose of this is to analyze the individual needs, competencies and skills needed in order to meet the customers satisfaction (Barlow and Møller, 1996). Customer's feedback act as a mechanisms to capture information from the external environment – a key enabler of organizational learning capability (Chiva et al., 2007). By analyzing the customers feedback, organizations to find the potential missing skills and information needed to provide the best performance. For example, it facilitates the identification of performance issues and its root causes.

3. **Employees annual evaluation and feedback.**

   This analysis answers the question of what skill sets or roles are missing or lacking. This is done through:

   a. Assessments and performance analysis. Mid-year and end of year evaluations are normally a good source of information relating to improvement areas.
   b. E-Learning Assessments which give a good indication of what employees' actual knowledge versus expected and desired knowledge. LMS (learning management system) can be sued to pinpoint patterns and trends of the major issues.
   c. Observation: staff is monitored during performing tasks and to determine areas for improvement.
   d. Surveys: staff can be more open and honest answering surveys related to their needs and requirements.

4. **Competencies and skills analysis**

   This is an assessment of processes/operational needs. Such analysis answers the question of "how can we do things more efficiently"?

a. During this, various operations are analyzed, through new analytical systems; processes that required improvement are identified. Most of the organizations have competencies frameworks which identify the needed skills and competencies for each certain job in the organization. This framework should be reviewed and updated annually. Learning programs are normally considered to bridge this gap and to support the transformation process needed to support the improvement.

5. **Operational report**

   The standard operation manuals reflect the level and complicity of systems required to ensure the smoothness and efficacy of operation in any organization. Such analysis reveals the needs for any new systems and any incompatibilities between the existing ones. The operational report may act as feedback mechanisms to understand the gap between the current and expected performance (Kaplan, 2009).

6. **Use the Information Previously Collected about the Gaps in the Organization**

   All possible resources should be utilized including any previously identified gaps. Previous efforts and past identified gaps that might still exist have to be included. Filled gaps can be used in the learning process and be benefitted from as lessons learned.

5.2.1.2 Learning Program Selection

This stage follows the gap analysis identification, where gaps should be analyzed and prioritized and turned into learning objectives. The goal is to bridge the gaps through the development of a learning program using the existing enablers and taking into consideration the influential factors. This stage contains one task which is determining the best learning program.

1. **Determine the best learning program to fill in gaps**

   At this task, the best learning program to fill in those gaps should be identified. This is normally done by meeting the Learning and Development (L&D) team to rank each performance gap and determine the best method and learning program to tackle this issue. This task goes through the following main steps:

   a. Making sure that the learning objectives are clear.

   b. Identify a mixture of methods that is best suited to achieve the learning objectives.

   c. Verify which methods are more suited for the type of learners we have within the organization.

d. Verify which methods are supported by leadership and the experts and make sure that the chosen methods are practical.

e. Make sure that the methods are available and allowed to be used and ensuring that the budgets are there to cover the logistics of any chosen method.

f. Make final choice and set the learning programs based on the chosen methods.

5.2.1.3 Plan and Design

Once the learning program is selected, the plan and design stage start. This stage consists of three tasks which aim to identify and facilitate all the needed resources to start the learning program.

1. **Plan the learning program**

   Information gathered in the previous stage, can be used to craft a learning strategy and comprehensive plan that incorporates learning theories, content, material, instructional design, as well as any other elements based on the existing and available enablers. At this task, the organization should prioritise the skills which are lacking, and the gaps identified. Also, the organization can decide how they want to deliver the learning and how it will be reinforced so that the learning leads to long-lasting behaviour change. The needed resources and delivery methods should be detailed.

2. **Identify the tools for the digital delivery of the learning program**

   For the purpose of this study, the researcher will focus on technology enabled and digitalised solutions as the best way to bridge the gaps and reach the desired level of learning and performance (for more details, please see section 3.4)

   The ideal digitalised tool is selected based on the following criteria:

   a. Features: It is important to select a tool or a system that offers the right features. This does not mean in any way that the tool has more features. The focus should be on the optimisation and prioritization of the organizational requirements.

   b. Integration with existing systems and tools: the tool should not be assessed in isolation. To be effective, any selected tool should integrate with systems already used in the organization.

   c. The Right Price: the selected tool should offer good value in relation to the requirements.

   d. The digitalised tool identified will be utilised during the next stage.

3. **Design the learning program**

   At the learning designing task, the organizations need to:

   a. Identify what the learner needs to be able to achieve the learning objective.

   b. Organize the learning content in logical steps.

   c. Design ways for the learner to demonstrate what they are learning. Such as learning through small group discussion with debriefing, case studies, hands-on practice, and simulations.

5.2.1.4 Learning programs delivery

At this stage, learning programs come to life. Decisions about best delivery methods should have been made. This stage contains two tasks.

1. **Prepare the learning environment based digitalised tools**

   For the purpose of the study, the focus will be on digitally enabled methods whenever possible. Technology should be utilised in scheduling the learning. Also, during learning programs, participant progress should be monitored to ensure that the program is effective using digitalised systems all the way.

   The digitalised tool that had been identified in task 3.2 in the OLC model will be fully utilised at this task. It will further be utilised during the next task of program delivery as well (task 4.2).

2. **Deliver the learning program using the digitalised tools.**

   To meet individual learning styles and strengths, organizations tend to create an ideal mix of methods. Most popular ones are:

   a. *Face-to-face delivery*: This is done through interactive workshops built around action-based learning.

   b. *Virtual delivery*: programs can be delivered using virtual interactive classrooms. This seems to be the best way to reduce time away from work during learning.

   c. *Blended delivery*: This is one of the most effective delivery methods as it combines virtual and face-to-face delivery, it offers high level of convenience convenient for employees, embeds learning quickly and delivers outstanding results.

5.2.1.5 Impact Evaluation

The monitoring of the learning programs delivery, using digital tools should carry on until the end of the learning cycle. The entire learning program should be evaluated to ensure that the objectives are met and gaps are mended. The feedback should be collected from all stakeholders and it should be analyzed. Any identified issues or weaknesses of the program should be revised and another corrective action should be put in place. A Kirkpatrick scale (Kirkpatrick, 2015) with its four levels is used for evaluating the training programs as a preferred method to measure the impact of the learning. Each level is considered at a time, where moving up increases the difficulty. While it is tempting to focus on the higher levels of assessment straight away, it is imperative that we first focus on getting the maximum insight out of the lower levels and properly implement their measurement. The four levels are: evaluation of reaction, evaluation of learning, evaluation of behaviours, and evaluation of results.

Based on the proposed OLC model this stage consist of four tasks.

1. **Evaluate the learning program through the employees.**

   In this task, the organizations need to evaluate the reaction and the learning. This will be done by evaluating the learning program via the employees which includes evaluating the learning methods, the digitalised tools and the whole learning program. Also, the employees should be evaluated based on their reaction during the learning program. Those evaluations can be done by creating surveys based on the goals of the learning program.

2. **Evaluate the impact through the line mangers.**

   In this task, the organization should evaluate the change in behaviours of the employees. This evaluation should be done after finishing the learning program and applying what has been learned in the daily work for some time. Therefore, this task should take place three to six months after finishing the program. The evaluation should be done by the line mangers of the employees who finished the learning program. The evaluation should be based on the identified learning outcomes of the learning program.

3. **Measure if the outcome made a major impact on performance.**

   In this task, the organizations are asked to evaluate the result of the learning programs. As this research is covering the public service organizations which provide only services, the results of the learning programs will be measured based on the change in performance. Therefore, the organizations should measure the strategic, services and productivity key

performance indicators (KPIs) of the units where the employees work on. This evaluation should be done six to twelve months after conducting the learning program.

4. **Apply a digitalised solution to measure the impact**

   All the tasks in the impact evaluation stage should be done through a digitalised solution. The human resources database in the organization can be integrated with the learning program digitalised solution in order to send the evaluations mentioned in tasks 5.1, 5.2, and 5.3 to the employees, the line mangers and the units where the employees work.

5.2.1.6 Knowledge Transfer

Learning programs should produce valuable knowledge, which should be captured and shared across the organization. There is a high degree of overlap between this stage and the previous stage. Regardless of the breakdown of stages, organizations should ensure the following:

1. **Gather feedback from employees and managers and various stakeholders.**

   It is very important for the organization to always leave an open channel to gather feedback about any process in the organization. Although the organization were asked to evaluate the learning process as mentioned in the impact evaluation stage, the organizations need to be able to accept feedback at any stage. The feedback should be open to all parties in the organization such as stockholders, employees, managers and customers.

2. **Maintain a digital record of the new knowledge created and shared in the organization.**

   All the stages of the learning process should be documented digitally. This is important in order to review the learning process whilst simultaneously sharing the new knowledge with other employees in the organization.

3. **Keep a "lessons learned" log.**

   After finishing the learning program, the organization should have a "lessons learned" log in order to capture all the new knowledge and to transfer challenges into opportunities to be improved in future work. The lessons learned log will be used as an input for the next knowledge gap identification (Stage 1).

5.2.2 Enablers

Enablers include a range of strategies, policies, methods, tools, and techniques that facilitate the learning process within the organization. For the purpose of this research, enablers are identified as the contextual factors affecting learning in organizations. These enablers need to be considered in the organizations before starting any learning process.

The author is proposing six enablers to support a learning environment in the organizations. Those enablers are: Supportive Leadership, Altruism, Visualization, Relationships with Universities, New Technologies and Learning in Communities. This list of enablers is based on the literature finding presented in Table 3.2, Section 3.3.3 as well as the data analyzed from the field study shown in Figure 4.5 and explained in Section 4.3. The six enablers represented the most effective enablers.

The following is a definition of each enabler in detail:

1. **Supportive leadership**: In supportive leadership, managers and leaders do not just give orders. They get involved with the work, giving employees the tools they need to work themselves. They delegate, empower and evaluate the results. They also work through the tasks with employees to improve skills and talents until they do not need to worry about tasks being done correctly and the employee is fully empowered. The learning process requires that the leaders be supportive in their approach so the process can work smoothly.
2. **Relationship with Universities:** the organization must have a list of the national and international universities that could support the implementation of the different initiatives based on the specific defined learning programs. Also, maintaining a relationship with universities supports the discovery of state-of-the-art knowledge, even before it becomes mainstream. Cooperation with universities and their research centres becomes pivotal to ensure the right knowledge is cascaded in the learning initiatives. Also, it provides the organizations with the latest research and study of the continuous generation.
3. **Altruism:** When employees act to promote someone else's welfare, even at a risk or cost to ourselves. It is to cooperate rather than compete. Altruism level and culture within the organization highly affects its learning process. This can be explained through the definition of altruism being an attitude that arises from voluntary, unforced, behaviours, whose interactions are directly perceived from one individual to the other which promotes and boosts the organizational trust. Organization trust has been identified as a key factor in

acquiring, disseminating, and possessing knowledge. Thus, altruism promotes performative learning by influencing the internal organizational environment and promoting trust (c.f. Edmondson 2006).

4. **Visualization:** One can understand general the Visualization concept when linking it to information. Visualization means "the use of computer-supported, interactive, visual reorientations of abstract data to amplify cognition". Researchers discovered that conceptual understanding can be significantly boosted through visualization, as the human sense of sight is proven to be such an effective device. Pictures, tables, maps, diagrams and recently, technological and digitalised learning visual tools, are effectively helping in clarifying subjects and increasing the information retention rates.

   The more complicated the matters in the organization, the more essential it is to visualize them. For example, process development and innovation are complicated matters. As a result, such matters need high level of visualization.

5. **New Technologies:** New Technologies succeeded in transcending distance and time. New technologies in learning despite their cost led to distance neutralization and synchronicity. Examples of new technologies include bringing video into the classroom and the use of the Internet to link students at remote sites. Groups, as well as individuals are enabled from accessing learning materials such as e-courses, webinars and knowledge meetings any time and almost anywhere. Idea sharing became easier via email or various other platforms eliminating the restrictions of time, multiple geographic locations, or the complications of scheduling.

   This model describes the use of technology to enhance the learning process. Computer software and hardware, Speech-To-Text options, virtual and Augmented Learning Experiences and 3D printing etc. enabled greater hands-on involvement by learners and promoted the self-discovery of knowledge that is essential for organizational improvement.

6. **Learning in Communities**

   The community of practice is identified as "a set of relations among persons, activity, and the world, over time and in relation with other communities". In a community of practice, people act together and interact formally or informally to share the ways of understanding. Learning in communities and communities of practice should exist to improve the learning

process where individuals share their tacit experiences with their co-workers in a knowledge sharing and creation space.

5.2.3 Influential Factors

Similar to the enablers, in this research, the literature had been thoroughly examined for factors influencing the learning process' tasks. To identify the factors affecting the learning process, organizations were asked to identify the factors that have an influence on learning processes in section 4.3 Figure 4.6.

In the proposed model, the nine factors had been found to have a significant impact on different tasks of the learning process. The most effective factors are knowledge sharing, dialogue, participative decision making, interaction with the external environment, teamwork, cooperation and group problem solving, experimentation, risk taking, systems thinking and, leader commitment.

1. Knowledge sharing

All organizations have knowledge, learn over time, and consider their knowledge base as a key asset. The fear of losing this knowledge urged organizations to create permanent environments to store knowledge. Knowledge sharing is the ability of an organization to transfer knowledge and information. Knowledge sharing involves spreading the internal knowledge acquired at an individual level. Through effective knowledge sharing, organizations can improve their performance and achieve better results.

In a strive to retain and share knowledge, organizations turned to digitalised solutions. Digitalisation can reduce costs by moving to a paperless environment where, for example, paper and manual are replaced by software. Also, data collection can be done automatically, allowing data to be mined and analysed in a more effective manner which increases the performance of the organization.

A key element of knowledge sharing utilizing digitalisation is related to Information and communication technologies (ICTs). Organizations nowadays are utilizing ICTs including products and services such as desktop computers, laptops, mobile communication devices, the internet, wired or wireless intranet, business productivity software such as text editor and spreadsheet, enterprise software, data storage and security, network security amongst others, are currently integrated into everyday lives to cut costs and improve efficiency, as well as to improve communications between teams.

Digitalisation can support knowledge sharing and learning processes through various effects including:

- Spreading expert knowledge via effective knowledge sharing systems.
- Reduced learning-times.
- Reduced costs.
- Consistent delivery of materials.
- Proof of completion and certification.
- More efficient analysis of various data including feedback and requirements.

Through this study, knowledge sharing was identified as a key influential factor that affects the learning process in any organization. Digitalisation of learning process is a key factor that is implemented through the model labelling its aspects.

2. Dialogue

Dialogue classically is defined as a sustained collective inquiry into the processes, assumptions, and certainties that compose everyday experience. (Isaacs, 1993). To a large extent, scholars agree on the meaning of the term dialogue as "coming to an understanding with someone in dialogue". Dialogue aims to build a group that can think generatively and creatively.

Authentic dialogue fosters and nourishes organizational learning because it creates many perceptions and a general buy-in, rather than individual opinions and one single view. Through dialogues, individuals or groups with different visions who meet to solve a problem or work together create a dialogic community.

In a healthy dialogue, each participant is willing to share knowledge with one another, also willing to risk confusion and uncertainty about themselves, their own assumptions, and other's assumptions with the issue at hand. Dialogue partners are normally willing and able to acknowledge that they lack knowledge and that they need to listen to the other and learn with an open minded approach. Dialogue can help staff to establish shared meaning and understanding, and to learn together.

Dialogue and encouragement of communication make up the knowledge transfer and integration dimension. Dialogue has positive impact on the nature of ideas and opens new horizons to staff.

The proposed OLC model highlights dialogue as an influential factor for the learning process. Such factors should be implemented and emphasised upon while designing the learning process. Dialogue is factored in during the initial organizational need assessment process and throughout the implementation stages including the planning and designing of the learning.

3. Participative decision making

Participative decision making is identified as the extent to which employers allow or encourage employees to share or participate in organizational decision-making (Probst, 2005).

A participative management style offers various benefits at all levels of the organization. By creating a sense of ownership in the organization, participative management motivates employees to increase productivity in order to achieve their goals. The participative decision making enables individuals to make more accurate and creative decisions. This positively affects the learning in the organization. People who are involved in the process tend to seek learning to be able to have an influence and play a positive role.

In the proposed OLC model, research assumes that all decisions related to the learning within the organizations are made collectively where all stakeholders and affected parties are involved and where their vision and ideas are reflected. For example, during the stage of planning and designing the learning, learners, experts and managers are consulted and their feedback is taken into consideration while making final decisions. The vision for learning is not coming from an individual or individual department or section; rather, it is a shared vision by all concerned parties. The digitalised methods can ease this process as feedback and contributions can be collected using the different digitalised methods.

4. Interaction with the external environment

Organizations are changing quickly to respond to a more complex, interdependent and hard-to-predict world. Organizations are open to the world and they can't have a silo culture if they wish to succeed. Closed organizations have less ability to learn as their learning is excluded from the external environment which highly affects them. Interaction with external environment factors represents significant learning mechanisms for innovation. This should be highly encouraged and supported as it has direct positive influence on learning process and results. Organizations that are open to the external world, through various means, tend to be a more learning organization and as a result, a more creative organization. Organization practices and processes should stem from benchmark exercises globally and regionally.

The digitalised solutions make it easier to interact with the external environment via new communications channels, so the time and space factors are no longer obstacles. Organizations should be open, to utilise external resources via those digitalised solutions to build more effective internal processes.

5. Teamwork cooperation and group problem solving

Teams are defined as work groups that exist within the context of a larger organization and share responsibility for a team product or service (Hackman, 1987). Teams play a crucial role in organizational learning. Organizations rely on teams to carry out critical strategic and operational tasks. Teams develop strategy, design and produce new products, deliver services, and execute other key tasks that influence organizational performance. An organization's ability to learn, and to improve its outcomes through better knowledge is dependent on the ability of its teams to learn.

Coherent and effective teams bring knowledge and experience together which helps solve problems effectively and positively affect the performance of the organization.

The proposed OLC model focuses on the role of teams in problem solving and developing solutions and creative ideas to increase efficiency. The involvement of people in the model takes various formats to encourage healthy dialogues. Idea generation is encouraged through well-structured digitally enabled systems including the digitalised suggesting schemes. Physical and virtual teams (via technological applications) should be enforced and empowered to support the learning process.

6. Experimentation

The concept of experimentation is identified as the degree to which new ideas and suggestions are attended to and dealt with sympathetically. There is a positive correlation between the ease and effectiveness of the learning process and the experimentation level within the organization. There are many reasons supporting experimentation as one of the most influential factors of learning. The model supports experimentation because:

- It accelerates learning: it uses critical thinking, problem solving and decision making to deliver a training module which is an established method to accelerate learning. Experimentation is encouraged through the learning communities and will be incorporated in the learning process.
- Provides a safe learning environment: Simulations use real life scenarios, so people get the benefit without facing the risks. Simulations will be part of the learning methods used to

capture and harvest new kinds of knowledge during learning as well as during the knowledge transfer. The simulations used will be digitalised and shall utilise the new available technologies.

- Bridges the gap between theory and practice: this enables learners to gain experience by practicing what has been taught. This plays a crucial role in retaining concepts and ideas.
- Produces mindset changes: mindset changes are one of the key success factors in introducing new ideas and to encourage creativity. This is what the model is trying to establish where the changes brought by digitalisation are used to increase efficiency and improve results.
- High return on investment (ROI): experiential learning is effective in nature. It goes beyond classroom learning and ensures that there is high level of retention, thereby delivering exceptional ROI over a traditional learning program.
- Enables personalized learning: participants set their own learning pace. By combining technology and simulations with experiential learning, this concept can be available anytime and anywhere, across multiple devices.

7. Risk Taking

A significant relationship exists between risk taking and organizational learning as well as between risk taking and organizational resilience. Risk is related to tolerance of ambiguity, uncertainty and errors. Employees should be encouraged to be risk takers and to have new ideas without worrying about errors.

On the other hand, organizational learning is fundamental for the survival of the organizations as resulted from various environmental dynamisms. The process of learning involves the structuring of new knowledge as well as reconstituting existing knowledge. Since organizations operate in an uncertain environment, learning decisions requires accepting risks and acting proactively to mitigate them. The proposed OLC model itself is a live example of risk taking as it sets a new trend, process and approach to OLC. The high utilisation of technology and being a leader in this approach carries some calculated rather than random risks. Correct implementation of the model should lead to improvement and development.

8. Systems Thinking

Learning organizations encourage a holistic approach called systems thinking. Systems thinking stems from the tenets of system theory, where each process integrates with all the others. Basically, it means the ability to see the big picture and to be able to see the interrelationships between what might, at first, seem to be completely unrelated (Senge P. 1992).

Systems thinking frameworks build understanding among employees regarding the interrelationships of key components of systems that run in the organization (Shoid et al 2011). Such frameworks help and support the learning process, as they ensure consistency amongst the staff and leadership of any organization.

The proposed model is a reflection of systems thinking, as all the steps and processes are highly integrated. The general umbrella for the proposed model is utilising digitalised methods to boost learning and to transfer knowledge to improve efficiency.

9. Leader Commitment

Leadership is a major factor promoting successful learning organization. Leaders are expected to continuously promote learning environment. Leadership found in learning organizations was dissimilar to those found in traditional organizations. Leadership found in learning organizations is likely to be transactional and transformational.

Various studies (including this research) confirmed the significance of leadership. The commitment of leaders remains an essential factor in achieving objectives. Leaders and managers should support and enhance commitment to learning and innovation within the organization.

In this research, as demonstrated in the model, leadership is a main factor that is interlinked to Technology Utilization, where committed leaders tend to develop knowledge management supporting systems and promote the implementation of technology. Leaders are expected to offer top-down support, as this affects confidence and involvement of massive people. As a leader's commitment is important for different stages of the learning process, organizations should take heed of its value by linking it to the leader's job descriptions.

The previous nine factors need to be taken into consideration and practices related to them should be nourished as they highly influence the learning process, thus affect the performance of the organization. Table 5.1 shows the importance of each influential factor to the six stages of the learning process.

Table 5. 1: Dynamics of Influential factors in Learning Process.

Learning Process / Influential Factors	**1- Knowledge Gap Identification**	**2- Learning program Selection**	**3- Plan and Design**	**4- Learning Program Delivery**	**5- Impact Evaluation**	**6- Knowledge Transfer**
Knowledge sharing	✓✓✓✓ Knowledge sharing culture eases this stage	✓	✓✓✓	✓	✓	✓✓✓✓✓ Focus of KS culture
Dialogue	✓✓✓✓✓ Needed to ensure all parties' input	✓✓✓✓✓ Needed to ensure all parties' input	✓✓✓	✓✓	✓✓✓✓✓ Key for Impact evaluation	✓✓✓✓ Dialogue needed to ensure KS
Participative decision making	✓✓✓✓✓ Key to ensure all parties input	✓✓✓✓✓ Key to ensure all parties input	✓✓✓✓✓ Key to ensure all parties input	✓	✓	✓✓
Interaction with the external environment	✓✓✓✓ To include external feedback and input	✓✓✓✓ Open to new programs	✓✓✓	✓✓✓	✓✓✓	✓✓
Teamwork, cooperation and group problem solving	✓✓✓✓ Affects ability to collect accurate data	✓✓✓	✓✓	✓✓✓✓	✓✓	✓✓✓✓ Ensure right corrective actions
Experimentation	✓✓	✓✓✓✓✓ Key to try new methods	✓✓✓✓✓ Key to try digitalisation	✓✓✓✓✓ Key to try digitalisation	✓✓✓✓ Support the implementation of new learning	✓✓
Risk taking	✓✓	✓✓✓✓✓ Key to consider new approach	✓✓✓	✓✓✓✓✓ Key to consider digitalisation	✓✓✓	✓✓
Systems thinking	✓✓✓✓✓ Key to ensure integration throughout the process	✓✓✓✓✓ Systematic approach to selection	✓✓✓	✓✓	✓✓✓✓✓ Collective integrated impact	✓✓✓✓✓ Key to Knowledge Transfer
Leader Commitment	✓✓✓✓✓ Cornerstone to start the process right	✓✓✓✓✓	✓✓✓✓ Commitment to new digitalisation	✓✓✓✓✓ Commitment to new digitalisation	✓✓	✓✓✓✓✓ Commitment to Knowledge Transfer

✓✓✓✓✓	Vital	✓✓✓	Important	✓	Lower impact
✓✓✓✓	Very Important	✓✓	Medium impact	x	No Impact

5.2.4 Digitalised solutions

The digitalisation of learning provides several benefits to organisations. Some benefits stem from reducing the cost of delivering learning programs whereby economies of scale are created at marginal zero cost; others stem from tracking and monitoring the performance of those undertaking the learning program, which can help to organisations to decide when to provide additional support to ensure the workforce complete the training successfully; while others result from removing temporal and geographical barriers to access the content whereby learners can study from their preferred location and time. Looking at the learning process, and for the purpose of this study, two stages can be fully digitalised:

- Plan & Design: this means using a learning program in a digital form which is best adopted to the gaps, depending on the digital enablers available.
- Learning Program delivery: this involves using a digitalised solution of a learning program where the whole learning program will be delivered digitally.
- Another two stages can benefit from digitalisation: (1) the impact evaluation and (2) knowledge transfer. The impact evaluation can be done by integrating the digital solution with several internal software such as the human resources portal and the key performance indicator portal. Also, the knowledge transfer, where the progress of the learning program can be digitally documented and where the lessons learned log is utilised and used for future work.

In order to digitalise the learning program, organizations need to do the following after selecting the learning program stages:

- Draw a mind-map for the learning program. The mind map will help the organization to identify the parties participating in the learning program and their role.
- Investigate the need of the data available in the organization's systems in order to be integrated with the new learning program solution, such as the year of experience, the employees' details and contact information, the employees job descriptions and their line

manager, and previous experts from the Human Resources portal. Also, the organization can benefit from internal digital resources such as emails, video meeting applications, learning software and internal digital communications tools.

- Design the digital solution to be interactive where all the parties can interact and document their tasks.
- Ensure that the database saves all processes of the learning program so the organization can monitor its progress.
- Ensure the cyber security of the digitalised solution.

Chapter 6: Learning Programs; Organizational Learning Capabilities Sub-models

6.1 Introduction

According to the proposed OLC model shown in Figure 5.1 organizations need to select the learning program after finishing the knowledge gap identification stage. The author believes that based on the proposed OLC model, different learning programs can be implemented within the OLC environment that bring innovative and nontraditional programs to enhance learning in the organizations. The selected learning program should fill any gaps identified in the knowledge gap identification stage. In this chapter, the research is proposing three learning programs as OLC sub-models; namely a coaching learning program, a Gemba-Walk learning program and a design thinking learning program. The three learning programs have been proposed as an example of implementing any learning program within the OLC model. Each learning program consist of a plan, design, deliver and impact evaluation stage. The three learning programs have been chosen based on the following assumptions of the knowledge gap identification output:

1. Coaching when the gaps show a need to improve certain employee competencies.
2. Gemba-Walk when the gaps show a need to improve a service.
3. Design thinking when the gaps show a need to have new innovative solutions.

6.2 Coaching learning program

The coaching learning program has been chosen to be presented in this thesis based on the sector perspective (refer to Section 4.3 and Figure 4.3) that indicate coaching learning is one of the most effective learning methods despite it not being widely used.

6.2.1 Coaching definition

Coaching started from 1980's in the United States. Over the years, coaching grew rapidly and took a more important position as a key learning method adopted by various organizations.

The International Coaching Federation (https://coachingfederation.org) identifies professional coaching as a "thought-provoking and creative process that inspires people to maximize their personal and professional potential."

Coaching is a dialogue process between the coach and "coachee". The coach makes the coachee aware of their strengths, weaknesses and blind spots by asking questions and opens dialogues. Coaching is used by organizations to enhance learning and increase organizational effectiveness (Kwan, 2015).

Swart & Harcup (2013), identified coaching as a learning & development approach to generate individual learning that results in collective learning, to be transferred to organizational learning.

It is professionally argued that coaching does not train but develops people. Despite the fact that coaching has been defined in many ways, the essence of coaching remains:

- To help change people in the way they wish and to progress in the desired direction.
- Coaching supports people to get self-realisation.
- Coaching helps leaders to change and to bring change to their organizations.

This leads us to the discussion of the concept of coaching culture. "Coaching culture exists in an organization when a coaching approach is a key aspect of how the leaders, managers, and staff engage and develop all their people and engage their stakeholders, in ways that create increased individual, team and organizational performance and shared value for all stakeholders." (Hawkins, 2012).

6.2.2 Coaching principles

For coaching to be effective, 8 principles should be taken into consideration:

1. The Coaching Spirit: this requires believing in human potential for greatness and the desire to bring the best out of people. Coaches should get satisfaction from adding value to others rather than considering their work as an apposition and a task only. Coaching should be for all, as coaches themselves need coaching.
2. Relationship and Trust: coaches should be pleasant, to touch the hearts of the coachees. They should practice integrity and build trust as well as confidence.

3. Asking Questions and Curiosity: this is a key success factor to coaching. Questions should be asked to empower and create the buy-in. Asking judgemental questions will kill the spirit of coaching. Coaches should be asking questions to encourage thinking and produce solutions and alternatives.
4. Listening and Intuition: coaches should be listeners rather than tellers. It is important that coaches should not jump to conclusions rapidly. They should listen, observe and use their intuition.
5. Feedback and Awareness: when giving feedback coaches should embrace and show acceptance, as it helps promote the change and create the desired impact.
6. Suggestions and Simplification: suggestions should be simple and be suitable for the purpose of coaching. Coaches should always get consent before giving any suggestions.
7. Goals and Action Plans: the coachee should have the ownership of their goals. The coach creates strategies and action plans based on the set goals. Coaches are normally encouraging and use visualisation techniques to leverage the law of attraction.
8. Accountability and Accomplishments: accountability drives accomplishments, so coaches should support goal completion by ensuring accountability. All achievements should be praised and acknowledged.

6.2.3 Coaching Tools and Methods

Coaching tools consist of worksheets, exercises, and other supportive materials used by coaches to enhance the coaching process. Coaching tools are a supplement to the coaching relationship and interaction with the coachees. The main purpose of coaching tools is using them to enhance the coaching experience and expedite the achievement of goals and objectives.

For example, coaching exercises can be used in one-on-one coaching sessions, workshops, and groups or given as individual homework. On the other hand, coaching assessments can be used to analyze strengths and weaknesses and give more personality insights.

There are many different kinds of coaching resources:

- Personality and Psychological Assessments.
- Journaling Prompts (questions, lists, dialoguing).
- Coaching exercises and Workbooks.
- Books or eBooks.
- Coaching Questions and Quizzes.
- Metaphors or Stories.
- Coaching Games (digital).
- Mindfulness and Meditation.

6.2.4 Coaching learning program as an OLC sub-model

The coaching learning program process shown in Figure 6.1, presents the steps of creating an effective coaching program. The process represents the stages from the OLC model presented in Figure 5.1 in Section 5.2. The coaching learning program will be selected by the organization when the output of the knowledge gap identifications stage shows a need to improve certain employee competencies. The coaching learning process consists of four stages: plan, design, learning program delivery and the impact evaluation. The four stages can be performed more effectively once digital enablers are applied.

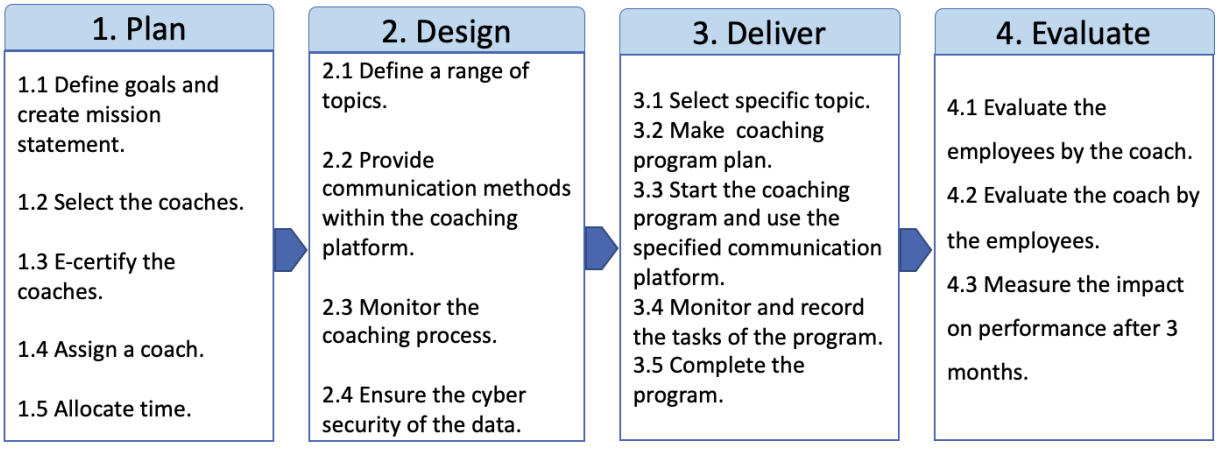

Figure 6. 1: Coaching learning program process.

1. Plan

The first stage of the coaching program is planning. The planning stage consists of 5 tasks as per the following:

1.1 To define the goals and create a mission statement: In this task the goals of the coaching learning program should be defined, and a mission statement should be created. This statement serves two aims:

- Create interest in the program by various potential coaches.
- Give coaches something to focus on as they move forward.

The coaching platform should have a dedicated section to allow process managers to enter goals that will be visible to all stakeholders. Such goals will be utilised later on during the evaluation process to ensure the efficiency and effectiveness of the program.

1.2 Select the coaches: Identify the type of coach who best fits the coaching task. Organizations tap into a database to select the right coaches that are available. The coaching platform should offer a feature of keeping a searchable database of coaches.

1.3 E-certify the coaches: In the task the selected coach should be E-certified by providing an e-learning course through the coaching platform. If the coach is already certified, a short quiz will be provided to the coach to be ready for the coaching learning program.

1.4 Assign a coach: This includes matching a coach and coachee. Coaches are assigned to the coachees based on their experience and ability to create the required effect and to achieve the set goals. Programs such as the “Caochlogicx” system for example, offer the availability to match the coaches and the coachees automatically through an automated system which reduces the human error. Such features should be applied to the coaching platform. For the purposes of this model, each coach should not be allocated more than 4 coachees.

1.5 Allocate time: To manage the coaching effectively, the coaching platform should allow for time booking and schedule creation on both the coach and coachee's calendar. An electronic calendar or schedule can be created for this purpose.

2. Design

Four tasks must be completed to design a coaching program. The four tasks are as follows:

2.1 Define a range of topics: organizations should have an inventory of coaching topics as a result of their learning needs analysis. Such topics are organized within the coaching platform. Once coaching goals are set for an individual, certain topics get selected to be the focus of coaching. The digitalised coaching platform makes the topic selection easier where many solutions offer the ability to match a topic with an objective.

2.2 Provide communication methods within the coaching platform: Coaching platforms should offer various ways of communication such as emails, video and audio communications, webinars, etc. At this stage, communication methods are selected and both the coach and coachee are given system permissions to utilise such communication channels. This also applies to "face to face coaching" as the platform is used to keep schedules and book venues for meetings.

2.3 Monitor the coaching process: Progress can be monitored regularly and automatically through the digital platform. Most systems offer tools to track progress and manage coaching plans. They also offer timely reminders to maintain momentum, as well as a running record of results, materials & insights.

2.4 Ensure the cyber security of the data: digitalised systems nowadays offer higher levels of security. The coaching process is governed by levels of privacy and security. This should be taken into consideration ensuring that right system permissions are given to the right people at the right time while general system security is assured.

3. Deliver

Delivering coaching involves five tasks as per the following:

3.1 Selecting specific topic: from the database of topics, coaches and coachees should agree a specific topic to be the focus of coaching for a set period of time. Both should be able to access the platform and make the choice.

3.2 Make coaching program plan: the coach should set the coaching plan which includes the tools needed, the timings and the activities. The organization should provide all the requested tools and accept the plan. The coachee needs to be aware of the plan.

3.3 Start the coaching program using the specified communication platform: Actual coaching delivery should start. All steps of delivery should be documented through the digital platform, starting with scheduling meetings, emails, and various communications. This is essential for tracking progress and for program evaluation at a later stage.

3.4 Monitor and record the tasks of the program: program managers should continuously ensure the usage of the coaching platform and ensure that coaching progresses as desired. They can use automatically prompted emails and other reminders to communicate with stakeholders to embrace the process or to prompt a corrective action.

3.5 Complete the program. When the program comes to an end, the platform should issue all notifications to various parties. Reports could be issued and preparations for the final evaluation stage should start.

4. Evaluate

The coaching evaluation process is integrally connected to the implementation process, where both are driven by clear design and pre-set goals.

Kraiger (2002) summarised key factors affecting the evaluation of coaching programs. Such factors include the additional costs associated with conducting the evaluation, the evaluator's

lack of expertise in statistics or research methods, and a lack of time, and the fact that it is difficult to evaluate coaching as it is individually customised and ruled by confidentiality.

Return on coaching investment (ROI) is context specific. For example, using coaching in two different organizations to improve problem solving, may cost the same (efficiency) and produce the same level of learning (effectiveness) and yet have no significant impact in one organization but a considerable impact in the other.

Steps of coaching evaluation:

Step 1: Lay the foundation:

- Determine the purpose for evaluation.
- Identify and secure resources for evaluation.

Step 2: Design the process

- Choose evaluators.
- Agree the method and content for evaluation.

Step 3: Implement the process

- Collect evaluation responses.
- Store response data.
- Ensure confidentiality and integrity of the data.

Step 4: Analyze the data

- Evaluate impact to measure if the program is consistent with strategic objectives.
- Evaluate effectiveness; this is to check if program objectives were met (e.g., have coachees improved), and how effective were the coaches?
- Evaluate efficiency; this is to test if investment in coaching justifies the benefits.

Step 5: Present the results

- Present results using various methods including graphical and statistical data.
- Share results with the stakeholders and concerned parties.

The evaluation stage in the proposed coaching learning process involves three tasks. The tasks are as per the following:

4.1 Evaluate the employees by the coach. The coach evaluates the coachees using the coaching platform through a function normally called progress tracking. Progress tracking will allow the coach to review the progress notes and steps and to fill in the required data electronically. The digitalised platform should be able to store the evaluations and create automated evaluations and reports based on reported observations and assessments if required.

4.2 Evaluate the coach by the employees: Evaluators should be able to share evaluation forms with the coachees in order to collect structured formal objective feedback about the coaches through the digitalised platform. Such data then gets analyzed to measure the effectiveness and the performance of the coach.

4.3 Measure the impact in performance after 3 months: the impact of the programs will be measured after a set period (for example 3 months) with the main purpose to ensure that the program is consistent with the set objectives. This will be done by contacting the coachee's line managers to evaluate the improvement in the employees' capabilities based on the goals of the coaching program and by measuring the improvement in performance through the productivity and strategic key performance indicators (KPI) of the units where the employees work.

6.3 Gemba-Walk learning program

The Gemba-Walk is considered as a learning program as being used widely in the manufacturing sector, where the top management facilitates the right group solving problem environment for the employees (Flores, 2021). Therefore, the author chose the Gemba-Walk learning program to be

proposed in this thesis in order to introduce a new learning program in public service organizations which aims to get the senior management closer to the service provision and to employees in their organizations.

6.3.1 Gemba-walk Definition

Gemba-Walk originates from the Japanese term ‘Genchi Genbutsu’ which means ‘Get your boots on and go see the reality’ (Bremer, 2014).

In business, 'Gemba' refers to the place where value is created, implemented and improved. The 'Gemba-Walk' is an activity that takes management to the front lines to look for waste (non-value-added activities) and opportunities.

The main objective of a Gemba-Walk is to understand the situation by involving all relevant people in understanding and dealing with a particular issue and finding a practical solution.

Gemba-Walks are becoming a popular management technique. By having leaders visit the workplace where activities are taking place, they gain better understanding and insight into the flow of value through the organization and can begin to conceive ways of bringing improvements and positive change. Employees are given the chance to provide detailed input and leaders use the input to create better practices. If a Gemba-Walk is applied properly, it normally brings excellent results.

Gemba-Walk had been considered as a common Lean practice and was implemented into service sectors for continuous improvement (Goh & Ryan, 2002; Tyagi et al, 2015). For example, Njiiri (2008) concluded that waste can be eliminated at the workplace and the use of public resources can be enhanced through Gemba-Walks. Radnor (2008) mentioned that the application of Gemba exists in actual healthcare practices. Sharing this interest in investigation Gemba-Walks in the health sector, Mannon (2014) investigated the application of Gemba-Walk to boost the quality of healthcare management.

Radnor & Boaden (2008), looked into this with a different perspective, studying factors that influence the effectiveness of Gemba-Walks in public organizations and concluded that due to

complex factors, obstacles such as customer requirements and lack of system thinking, it is more challenging to apply Gemba-Walks in public organizations.

6.3.2 Key Elements for effective Gemba-Walks

To ensure effective Gemba-Walks, there are certain steps to be considered:

1- Paving the way: The first step lies in the hands of the leaders who should develop missions, scopes, and goals for the walks (Cherrfi et al, 2019). Gemba-Walks should not be confused with Management by Walking Around (MBWA), while in the past, leaders simply wander about and get involved in what employees are doing, a Gemba-Walk should have a defined purpose associated with a specific concern or problems related to a KPI or performance.

2- Team Preparation: It is important to prepare team members who will be observed and engaged during the walk, so they have clear understanding of what a Gemba-Walk is. They should be briefed on the purpose, mechanism, expectations and make sure that they are comfortable and confident before the exercise takes place (Bremer, 2014).

3- Environment: A supportive environment is essential to facilitate the Gemba-Walk (Bourgault et al, 2018). As stated by Schipper (2012), "a corporate culture of Gemba should be nurtured in advance instead of implementing the walks directly". Several criterions were designed to foster the proper culture (Salah et al, 2015). For instance, an incentive system is used to encourage the works. Empowerment, another criterion of encouragement, boosts employees to participate in decision making.

4- The Right focus: The focus should be on processes, not people. Gemba-Walks should not be considered as an employee performance evaluation.

Documentation remains key during the process. There is a lot to remember during the walks, so it is important to use the right tools to log observations. It is highly important to give comments and observations after the walk and not during the walk. It is important to have an improvement platform to share the outcome. During Gemba-Walks it is important to show respect to the employees (Tyagi et al, 2015).

5- Implementation: Leaders are recommended to have a clear structure for the way they question employees during the Walks (Bremer (2014). The 5 Ws provide an excellent structure for the questions and answers during your Gemba-Walk.

1. Who – Who are the observed people involved in the processes? The question should not be who to blame, instead it should be: Who provides input for the processes?
2. What – What are the inputs and outputs of the process and what obstacles halt efficiency?
3. Where – Does the workplace have the right resources to perform and achieve results?
4. When – Are process inputs available when needed?
5. Why – What value does this work add to the organization?

6.3.3 Gemba-Walk learning program as an OLC sub-model

The reflection to the proposed OLC model shown in Figure 5.3 and once Gemba-Walk is identified as one of the learning programs to be included, followed by the steps of plan & design, delivery, impact evaluation. Figure 6.2 shows the Gemba-Walk learning program process as a sub-model of the proposed OLC model.

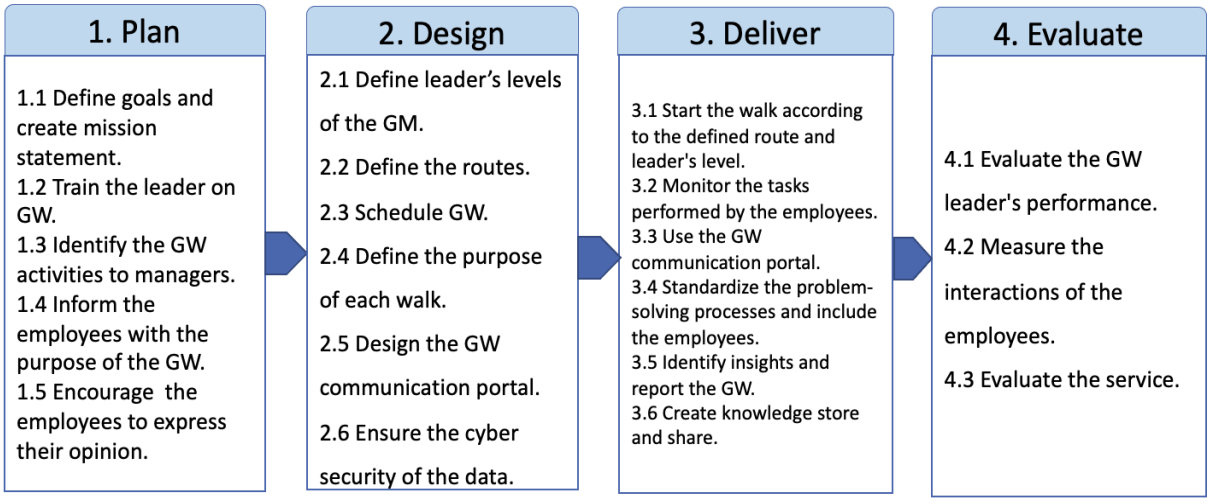

Figure 6. 2: Gemba-Walk learning program process.

1. Plan the Gemba-Walks

During planning stage, five tasks take place including:

1.1 Define goals and create mission statement: in this task, the goals of the Gemba-Walk should be defined, and a mission statement should be created. The statement serves two aims:

- Explore opportunities for continuous improvement.
- Engage front-line employees to solve problems and gain knowledge of working processes.

In the Gemba-Walk learning program, leaders should set clear goals that will be visible to all stakeholders, also, there should be clear KPI's to measure the goals, efficiency and effectiveness of the Gemba-Walk.

1.2 Train the leader on GW: The Gemba-Walk is not common knowledge. Involved leaders should be trained to get the best out of this unique learning method. During training, managers learn which circumstances indicate that problems are present, what questions to ask workers, etc.

1.3 Identify the GW activities to managers: Specific activities should be identified and set to ensure that the walks are done properly.

1.4 Inform the employees with the purpose of the GW: Employees are the key success factor. They need to fully understand the objectives of the Gemba-Walk and they should have no fear or confusions. It is recommended to invite employees to suggest processes, or work areas that might benefit from a Gemba-Walk. The process will deliver better results if it becomes like a two-way street. The employees being on the front line doing the work, have better insight into the processes and areas of improvement.

1.5 Encourage the employees to express their opinion: After eliminating or reducing resistance, employees should be encouraged to participate and share their opinions. There must be a system in place with incentives to encourage employees to do that. Incentive systems can vary between

monetary and non-monetary ones. Leaders should be able to set a system that suits the needs of the participants and finds the best motivational methods.

2. Design Gemba-Walks

Designing Gemba-Walks include six tasks. The tasks are as follows:

2.1 Define the leader's levels of the GM: The Gemba-Walk should be done with a different focus depending on the leader's level. A hierarchy example is shown in Figure 6.3.

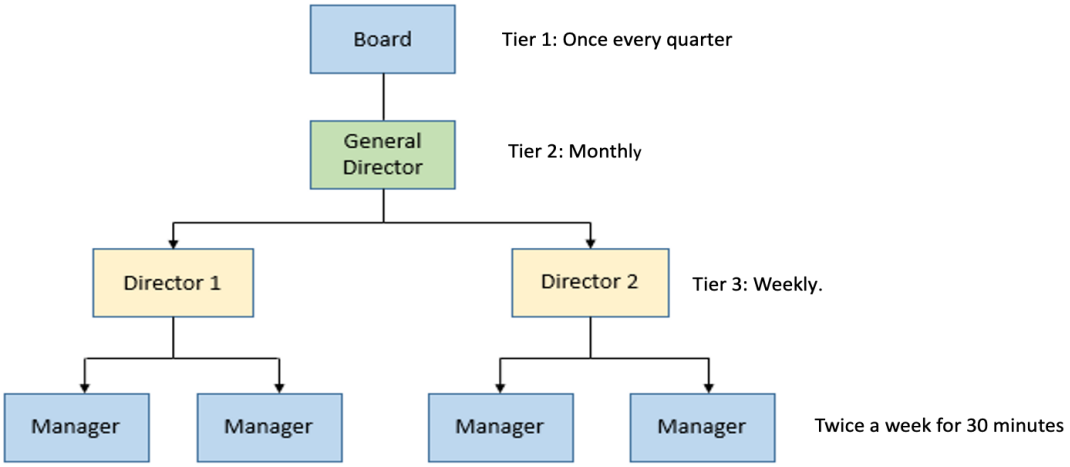

Figure 6. 3: Gemba-Walk schedule.

2.2 Define the routes: The Gemba route definition is very important as it should cover the areas where improvement is required as it is not a shopping tour. It should be set clearly to avoid overlaps. Leaders of Gemba-Walks can systematically identify the most critical paths and a list of stations to be visited during their Gemba-Walk.

2.3 Schedule GW: Gemba-Walks should be scheduled carefully. Scheduling should include time, agenda and preparation checklists with all participants. Normally it is recommended that each walk is 30- 60 minutes. Staff should be made aware of the times and schedules and if possible, they

should pre-approve the visits making sure it does not disturb the workflow or cause more negative issues.

2.4 Define the purpose of each walk: The general purpose and goal of the walk is set during the planning stage. Having said that, each walk should have a clear purpose. Leaders should define the purpose of their walk, possible achievements and keep front-line employees informed about the walk.

2.5 Design the GW communication method/portal: At this stage, communication methods are selected. Participants including leaders and front-line employees can use set channels, such as emails, video and audio communications. Leaders during the physical walk normally talk to the staff and make notes but do not give immediate feedback or criticism. Effective communication is a key success factor to the process.

2.6 Ensure the cyber security of the data: If communication methods used involve emails or any digitalised form, then the right system security and protocol should be ensured.

3. Delivering Gemba-Walks

Delivering Gemba-Walk involves six tasks including:

3.1 Start the walk according to the defined route and leader's level: After goals are set, the process is designed and schedules are in place, the walk should start. One of the most difficult things to do on a Gemba-Walk is to put aside assumptions about why work is done the way that it is. Leaders should not assume that everything is being done according to the standard. They should ask staff why they do things the way they do. They also should ask about how the work is documented, and why tasks are performed in a certain manner.

3.2 Monitor the tasks performed by the employees: Leaders not only ask questions but thoroughly monitor and make notes. They should focus on the process and workflow, rather than the people who are performing the tasks.

3.3 Use the GW communication portal to documents the process: Documentation is very important to capture the experience, retain knowledge learned and to analyze any gathered data. There are various ways to log observations. While old methods of pen and paper are no longer as efficient as digitalised methods, they are still used by many leaders. Ideally leaders should be able to submit observations into a continuous improvement platform via a cell phone or tablet so that they can use them later for follow up. Visual tools such as cameras and recording tools may be very useful to review the evidence later.

3.4 Standardize the problem-solving processes and include the employees: One of the main aims of the Gemba-Walk is to solve problems and make sure that there is a process in place to handle problems.

Starting with identifying problems, leaders should involve the employees in the process of identifying the problems they face.

Through the identified communication tools, they should be encouraged to have valuable inputs and participate in the discussion. When digitalised solutions are used, the input can be through e-mail, video/audio and filling the digital templates. One of the main steps in successful Gemba-Walk delivery is that leaders should return to the Gemba and evaluate the progresses and problem-solving.

3.5 Identify insights and report the GW: At the end of each physical walk, leaders record their observations and issue reports. It is bad practice to share observations during the walk without having had time to study them and do the required analysis. It is always important to follow-up with employees and share the findings to communicate the next steps.

3.6 Create knowledge store and share: Digitalised solutions allow effective knowledge management retrieval and sharing. This feeds directly to the knowledge transfer stage presented in the OLC model.

4. Evaluate the Gemba-Walk

The evaluation process is integrally connected to the implementation process, where both are driven by clear design and pre-set goals. The evaluation stage consists of the following three tasks:

4.1 Evaluate the GW leader's performance: The leaders should be evaluated based on the KPI's set during the planning of the walks. The Gemba-Walk platform should have the objectives and goals as well as the KPI's which make the evaluation easy and objective at the same time. It is safe to say, leaders are judged by the effectiveness of the Gemba-Walk (in terms of time, costs, and complaints).

4.2 Measure the interactions of the employees: As mentioned earlier, Gemba-Walks should not be mixed with the employee evaluation and should not be part of that. What should be evaluated is the process and the areas requiring improvement. The evaluation here focuses on the staff's ability to interact and participate. Also, it is important to monitor and evaluate their progress in terms of problem solving as a key aspect. In other words, front-line employees are assessed by the identified problems, raised solutions and knowledge from the data on statistical board.

4.3 Evaluate the service: At the end of the day, the main purpose of the learning process is to bring improvements to the service and to increase efficiency. The final judge to determine the success or the failure of the Gemba-Walk is to evaluate improvements on the service by looking at service indicators in general.

6.4 Design thinking learning program

In order to introduce a new learning program in public service organizations the author proposed the design thinking learning program in this thesis. The design thinking learning program aims to increase innovation within the organizations and introduce more innovative solutions. It encourages learning in groups within the organization, and improves the employees' skills and knowledge, whilst enhancing the service provision by introducing new innovative solutions.

6.4.1 Design thinking definition

Design thinking is defined as "a practical methodology and a creatively structured approach that those successful design leaders, technical leaders, and product managers used to solve complex problems and find the desirable solution for customers" (Anderson, 2018; Flores and Golob, 2020). The previous definition reflects a user-centric approach/human-centred design, (Gibbons, 2016). Design thinking helps teams as well as individuals to identify problems and come up with an innovative solution.

Various researchers focused on design thinking learning program as a way to identify problems and solve it. According to the reviewed literature, researchers such as Dam and Siang (2020) discussed the impact of design thinking programs to enhance people skills and develop better understanding for customer needs in a more customer-friendly manner.

Despite the fact that more attention had been given to the application of design thinking in industrial sectors, none of the researchers applied design thinking into the public organization. Not only is there a lack of visualisation of the learning outcome, but also a scarcity of using tools to measure the impact. Therefore, this thesis focuses on applying design thinking into the public organization utilising a digitalised solution.

6.4.2 Design thinking process

As mentioned earlier, researchers during the last decade gave more attention to design thinking, Table 6.1 presents a summary of the key research in this area which result in different ideas and focuses.

Table 6. 1: Summary of the design thinking process in literature.

No.	Year	References	No. of processes	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
1	2020	Flores and Golob	5	Empathize	Define	Ideate	Prototype	Test
2	2018	Chou	3	Inspiration	Ideation	Implementation	-	
3	2018	Beaird, Geist, and lewis	5	Empathize	Define	Ideate	Prototype	Test
4	2017	Lewis, Hayward and Hornyak	5	Empathize	Define	Ideate	Prototype	Test
5	2017	Ewin et al.	5	Empathize	Define	Ideate	Prototype	Test
6	2016	Goodspeed et al.	5	Empathize	Define	Ideate	Prototype	Test
7	2016	Fabri et al	5	Empathize	Define	Ideate	Prototype	Test
8	2015	IDEO	3	Inspiration	Ideation	Iteration	-	-
9	2014	Clune and Lockrey	4	Problem exploration	Problem definition/ Synthesis	Why are the practice as they are, what are the alternative	Validating alternatives and developing the plan	-
10	2010	D. school	5	Empathize	Define	Ideate	Prototype	Test

Based on the literature review, there is no unified process that has been used in design thinking. For the purpose of this research, the "d.school" method is adopted. This method consists of a process that includes five main activities; including empathise, define, ideate, prototype, and test as shown in Figure 6.4.

Figure 6. 4: Design Thinking Process (d.school, 2010).

The d.school, 2010 design thinking process is based on five key activities as explained below:

1. Empathise

It is very important to develop a clear contextual understanding of the people (stakeholders) involved within the context of the design challenge such as users and customers, as well as the market. During this stage, it is important to develop knowledge about the way users do and why (School, 2010). Also, it is important to understand their emotional and physical needs, what is important to them and how they think about it. Therefore, the output of this stage is understanding the people within the context of the challenge.

2. Define

In the define activity, the design thinker aims to define the challenges based on research and what has been observed about the people in the context of the empathise activity (School, 2010). The define activity is all about bringing clarity and focusing on the design area. This is a key activity as it pinpoints the user's needs and expectations and it defines the challenges which need to be addressed.

3. Ideate

The ideate activity aims to concentrate on idea generation. In this stage, designers brainstorm a range of ideas creatively to resolve any unmet user's needs (School, 2010). All the ideas the designers generate will be compiled to become the source material for building the prototype. Therefore, the output of this activity is a wide range of pooled ideas exploring various opportunities and possibilities within and beyond the design space envelope.

4. Prototype

The prototype is a step closer to the solution and gives more clear answers to the pending questions (School, 2010). In this activity, the designers will build a sample of the solution and will understand the applicability of the ideas and its components. The outcome here includes different aspects of design and potential solutions to get closer to the final innovative solution.

5. Test

This activity aims at obtaining feedback from users about the prototype suggested. The designer has the opportunity to understand the user's needs in more depth (School, 2010). This is an ongoing process, as testing keeps taking place while working on visions and solutions. Feedback should be obtained and taken seriously and utilised to bring change and improvements.

6.4.3 Design thinking learning program as an OLC sub-model

Many organizations including d.school, 2010 have applied design thinking within organizations to improve individual skills and general organization services. Based on the proposed OLC model shown in Figure 5.1 Section 5.2, the author is proposing a design thinking learning program as a sub-model. The design thinking learning program is chosen by the organizations when the knowledge gap identification stage in the proposed OLC model shows a need to have an innovative solution in the organization. The design thinking learning program will be delivered by performing the d.school, 2010 design thinking process in a workshop arranged by the organization. The design thinking learning program includes four main stages: 1. plan, 2. design, 3. delivery, and 4. evaluate. Each stage consists of various tasks. Figure 6.5 presents the design thinking learning program process as an OLC sub-model.

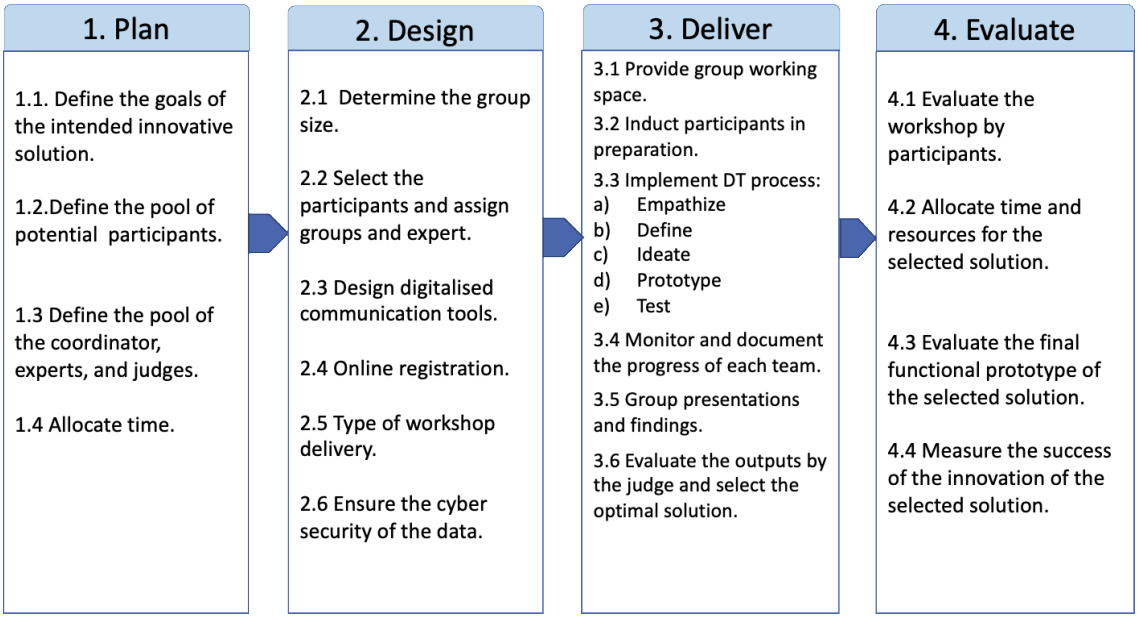

Figure 6. 5: Design thinking learning program process.

1. Plan

The planning stage is the first stage which contains four tasks as per the following:

1.1 Define the goals of intended innovative solutions: During this task, the organization needs to create the goals of the intended innovative solution. The goals will be created based on the outcome of the knowledge gap identifications. This will help the participant in the design thinking workshop to focus on the goals.

1.2 Define the pool of potential participants: Based on goals created in the previous task, organizations need to define the pool the participants who will participate in the design thinking workshop where they will be divided into groups. The pool of participants should cover all stakeholders. The identified pool should be from both internal and external parties in order to get more ideas and more thoughts. If the organization wants to invite external participants from other organizations, the organization should contact the participant's organization in order to nominate the right person who will attend the workshop or contact the participants directly if they do not represent any organization.

1.3 Define the pool of potential coordinators, experts and judges: Organizations need to define the pool of coordinators, experts and judges who will participate in the design thinking learning program. The coordinator will be the person who leads the workshop and explains the whole design thinking process to the participants. The expert will be the person who is an expert in the area which is intended to be improved in the learning program. The experts will help the participants in each group and answer any question. The judges will evaluate the final results and select the winning ideas.

1.4 Allocate time: To manage an effective design thinking learning program, the organization should allocate time for the workshop which is suitable for both internal and external participants, as well as the coordinators, the experts, and the judges. This could be done via an electronic calendar or schedule which can be created for this purpose.

2. Design

By this stage, goals and stakeholders are identified, and the process is all planned. This stage will include the following six tasks:

2.1 Determine the group size: It is essential to decide upon the group size that is needed to ensure the efficiency, effectivity and creativity of the workshop. Each group should have up to six participants. The group size will be determined based on the defined goals and the pool of potential participants (tasks 1.1 and 1.2).

2.2 Select the participants and assign groups and experts: As all the groups will be working on the same topic to find the intended solution and they are going to go through the same process, participants in each group should be chosen according to their background and skills in order to ensure balance between the groups. The organization needs to assign an expert for each group. The expert will lead the group and help them to enhance the process.

2.3 Design digitalised communication tools: Organizations should select an appropriate communication tool before starting the workshop. If the organization wants to deliver the workshop remotely, there are various software available such as Zoom, Microsoft Teams, Cisco WebEx, Etc. The tool should be carefully selected to suit the needs and capability of the organization.

2.4 Online registration: All stakeholders and participants (internal and external members, experts, judges, and coordinators) should be fully registered online through emails.

2.5 Select Type of workshop delivery: At this stage, organizations should select if the workshops will be delivered online, in person, or a combination.

2.6 Ensure the cyber security of the data: A high level of security should be ensured during the process to keep all data secure.

3. Deliver

In this stage the workshops will proceed. It will be more efficient and effective to deliver this stage by a design thinking platform developed by the organization as all the remaining tasks can be digitalised. The delivery stage includes six tasks as per the following:

3.1 Provide group working space: organizations should provide a working space for the participants in each group. If the workshop is decided to be online, then the design thinking platform should provide dashboards for all participants in each group to share ideas and provide the requested innovative solution during the design thinking workshop. However, if the workshop is going to be in person, a workspace or a room should be provided to each group.

3.2 Induct participants in preparation: Induction is very important to ensure that everyone is on the same page. The assigned coordinator should induct all the participants on the goals of the workshop, process methodology and fully explain the activities of the design thinking process as well as the winning idea selection criteria.

3.3 Apply DT process: After the induction, each group will start working independently following the design thinking process (d.school, 2010) to produce innovative solutions as the following:

- Empathize- The empathize activity aims to understand the user's feelings and needs. This can be done by some participants taking turns to play the user whilst the others ask them questions on their feelings and needs. The design thinking platform should provide a page where all participants can write what the users feel and need.
- Define- The define activity aims to define challenges and problems. This can be done using MakeMyPersona tool to create Personas, which are fictional characters created to represent a user type that might use the service. Persona's creation allows the creation of user journey stories featuring Persona's behaviour in representative situations (Cserti, 2019). The MakeMyPersona form could be uploaded on the design thinking platform and it can be filled out by the participants digitally.
- Ideate- The aim of this Ideate activity is to come up with a pool of ideas. The design thinking platform should provide an empty sheet for the participants to stick their ideas on a sheet.
- Prototype- This activity aims to create different aspect designs. As the workshop could be short in time, the prototype can be sketched by hand or drawn on a suitable sketching software. The prototype file can be uploaded to a design thinking platform.
- Test (feedback and input from users)- In the test activity, each group should present their prototype to the other groups to get feedback and enhance it. If the workshop is performed online, the group presentation can be delivered through the identified digitalised communication tool.

Figure 6.6 shows the outline of the design thinking workshop.

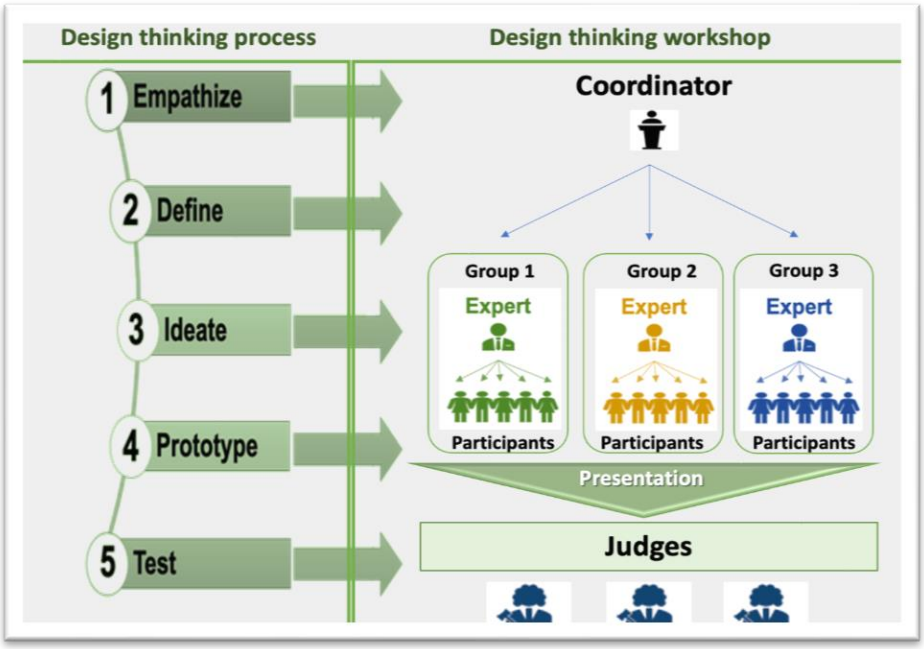

Figure 6. 6: Outline of the design thinking workshop.

3.4 Monitor and document the progress of each team: The design thinking platform should be used to monitor and document the progress of each team and produce the relevant reports.

3.5 Group presentation and findings: Participants of each group are expected to present their prototype to the judges. This can be done via the identified digitalised communication tool.

3.6 Evaluate the outputs by the judge and select the optimal solution: The judges will be presented by the findings and the various solutions and will be expected to evaluate them at the end of the DT process deciding on the validity and selecting the winning solution or group. The winning group will have the opportunity to work further into developing their idea into a tangible prototype.

4. Evaluate

The evaluation is the final stage. This stage aims to review how/what impact the developed learning process created in previous stages has on the service offering. This stage has four tasks including:

4.1 Evaluate the workshop by the participants: in this task the participants evaluate the workshop, the coordinators and the experts. Also, the participants need to evaluate what they gained form this learning program and if their skills have been improved. This evaluation can be done through the design thinking platform.

4.2 Allocate time and resources for the winning group: In this task, organizations need to allocate time and resources (i.e., financial, support or physical resources) for the winning group. The winning group will improve the innovative solution based on the given resources and come up with improved solution.

4.3 Evaluate the final functional prototype of the winning group: After the organization allocates time and resources for the winning group in the previous task to improve their solution, the judges will evaluate the final working prototype and give their permission to implement it in the organization.

4.4 Measure the success of the innovative solutions: The success of implementing design thinking program is related to the success of the innovative solution which will be measurable after three to six months of implementing it. This will be done by measuring if the new solution meets the intended goals identified in task 1.1. The design thinking platform should have a set objective and should be linked to actual results that measure the impact of the solution on the service provision.

Chapter 7: Digitalised Software Demonstrator of the OLC Learning Programs

7.1 Introduction

This chapter presents two software demonstrators which have been developed in order to digitalise the tasks of the coaching and design thinking learning programs. The digitalised software demonstrators have been developed to reflect how digital enabling technologies could facilitate the implementation of learning programs and to validate the OLC sub-models via two case studies in a public services organization using realistic data.

7.2 The digitalised software demonstrators

In order to digitalise the coaching learning process presented in Figure 6.1, Section 6.2.4 and the design thinking learning process presented in Figure 6.5, Section 6.4.3, two digitalised software demonstrators have been developed. The digitalised software demonstrators have been developed based on the tasks of both learning processes and the participants role in both learning programs.

This section describes design goals and considerations, provides a high-level overview of the digitalised software demonstrator design, the functionalities maps, database and system architecture, as well as the human-machine interface and operational scenarios.

7.2.1 General overview and the digitalised software demonstrator design approach

This section describes the principles and strategies to be used as guidelines when designing and implementing the two digitalised software demonstrators.

The proposed software demonstrators are designed with reusability in mind at every corner of the whole software. Selection of Open-Source technologies for developing the software demonstrators is a thoughtful decision towards further enhancements and extensions to the software demonstrator.

The architectural pattern for the development of the two digitalised software demonstrators has adopted Model-View-Controller (MVC) as it is one of the most frequently used industry-standard web development frameworks to create scalable and extensible projects (http://best-practice-software-engineering.ifs.tuwien.ac.at/patterns/mvc.html). The MVC design pattern separates an application into three main logical components: the model, the view, and the controller. Each of these components are built to handle specific development aspects of an application. The three main components of the software design pattern shown in Figure 7.1 are:

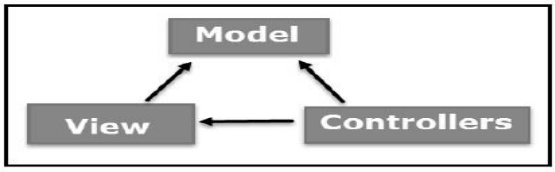

Figure 7. 1: The software design pattern.

Model: The Model component corresponds to all the data-related logic that the user works with. This can represent either the data that is being transferred between the View and Controller components, or any other business logic-related data. For example, a customer object will retrieve the customer information from the database, manipulate it and update it's data back to the database or use it to render data.

View: The View component is used for all the user interface (UI) logic of the application. For example, the Customer view will include all the UI components such as text boxes, dropdowns, etc. that the final user interacts with.

Controller: The Controller component acts as an interface between the Model and View components to process all the business logic and incoming requests, manipulate data using the Model component and interact with the Views to render the final output. For example, the Customer controller will handle all the interactions and inputs from the Customer View and update the database using the Customer Model. The same controller will be used to view the Customer data.

7.2.2 Coaching and design thinking functionalities maps

7.2.2.1 Coaching learning program software functionality map

Based on the coaching learning process presented in Figure 6.1, Section 6.2.4, three parties who will participate in the coaching learning program have been identified. The three parties are the Coach, the Coachee and the Unit who is responsible of learning within the organization (the Administrator). Therefore, a coaching functionality map has been created using a mind-map in order to clarify each user and their responsibilities in the software. Figure 7.2 shows the coaching functionality map which includes the three parties, namely Administrator, Coach and Coachee, who are needed to perform the coaching learning program. Also, the functionalities map shows their roles inside the software as the following:

- **The Administrator:** is the one who will initiate the coaching learning program and will be responsible for:
  - Approving and rejecting the coaching learning program.
  - Assigning the proper Coach to the Coachees.
- **The Coach:** is the person who will be assigned by the Administrator to perform the learning program. The Coach will be responsible for the following:
  - Taking the E-certification to be certified to perform the coaching.
  - Designing all the activities of the coaching learning program.
- **The Coachee**: is the person whose skills and competencies meant to be improved through the coaching learning program. The Coachee will be responsible for the following:
  - Request a coaching learning program.
  - Completing all the coaching activities requested by the Coach.

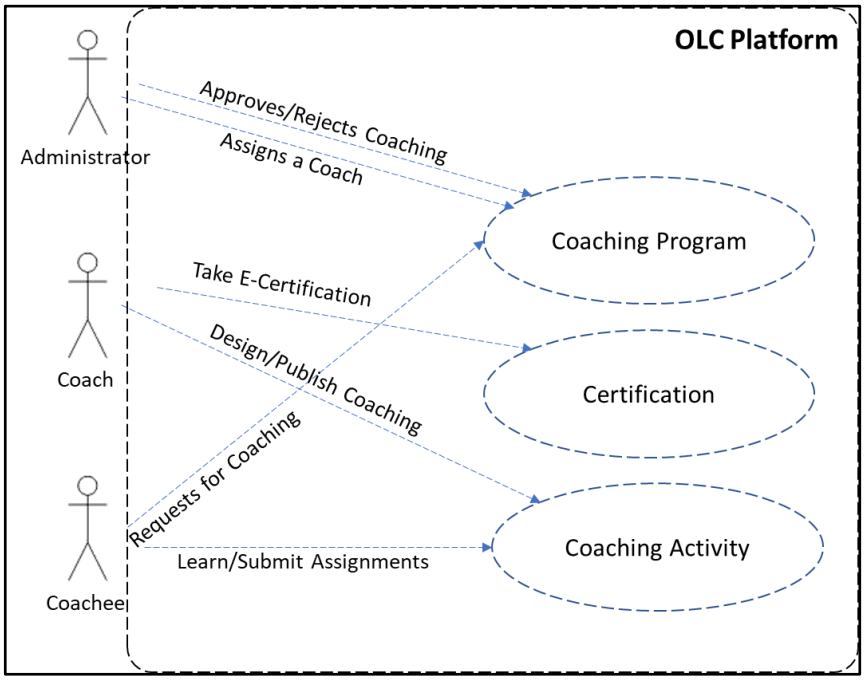

Figure 7. 2: Coaching software functionality map.

7.2.2.2 Design thinking learning program functionalities map

Based on the Design thinking learning process presented in Figure 6.5, Section 6.4.3 and the outline of the design thinking workshop presented in Figure 6.6, Section 6.4.3, five parties will be participating in the design thinking learning process. The five parties are: 1. Administrator, 2. Judge, 3. Employees (Participants), 4. Experts and 5. Technicians. Therefore, a functionality map has been created using the mind-map, as shown in Figure 7.3, to clarify each party and their responsibilities in the software. The five parties and their responsibilities are as the following:

- **The Administrator:** is the unit that is responsible for learning within the organization, and will be responsible for:
  - Initiating new design thinking workshops and assigning the parties of the design thinking workshop.
  - Managing in-going design thinking workshops.
  - Observing the delivery of the design thinking workshops.
- **The Judge:** is the person chosen by the Administrator to evaluate the outcomes of the design thinking workshops and will be responsible for the following:

- Evaluating the design thinking workshop that they have been assigned to.
- Observing the delivery of the design thinking workshops.

- **The Employees (Participants):** is made up of the participants who have been invited by the Administrator to perform the design thinking workshop to deliver the requested outcomes. The participants will be responsible for:
  - Attending and performing the design thinking workshop sessions.
- **The Expert:** is the person who is expert in the topic of the workshop and has been chosen by the Administrator based on that. The Expert will be responsible for the following:
  - Helping and leading the participants in the design thinking workshop sessions.
- **The Technician:** is the technical person chosen by the Administrator and is responsible for the following:
  - Providing technical help during the design thinking workshop sessions.

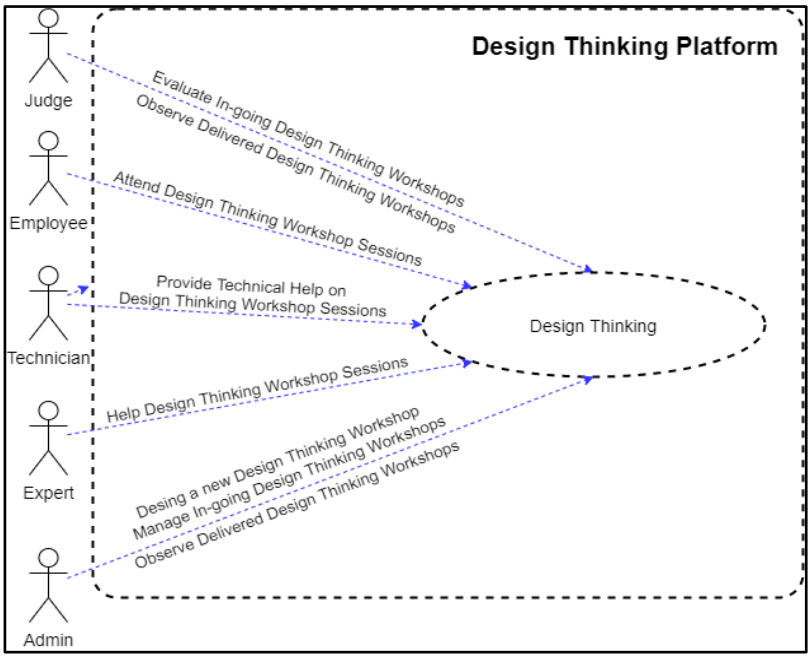

Figure 7. 3: Design thinking software functionality map.

7.2.3 Digitalised software demonstrators Database architecture

As with every relational Database Management System (DBMS), MySQL databases organize data into one or more tables of columns and rows, with a unique key identifying each row – named the primary key. Rows are called records, and columns are called attributes. To store the data needed by the software demonstrator based on the functional modelling, the database that has been created is composed of six tables for the coaching software demonstrator and seven tables for the design thinking software demonstrator.

Based on the coaching learning program participants and activities addressed in the coaching functionality map presented in Figure 7.2, six tables for the coaching software demonstrator database have been created.

Figure 7.4 presents the coaching database architecture which consists of six main tables. The tables' functions are presented in Table 7.1. As shown in Figure 7.4 the tables are connected to each other based on the coaching functionality map shown in Figure 7.2. For example, the employee table stores the information of the Coach and the Coachee. Once the Coach accepts the coaching learning program, it gets stored in the coaching table. Based on the coaching functionality map presented in Figure 7.2, the Coach starts designing the coaching learning program by initiating coaching activities which get stored in the coaching activity table. The Coach provides an assessment for each coaching activity, which gets stored in the coaching activity table. As the Coachee is stored in the employee table, the Coachee should do the assessment where the data will be stored in the feedback table. All the other functions of the coaching learning program are designed similar to the provided example.

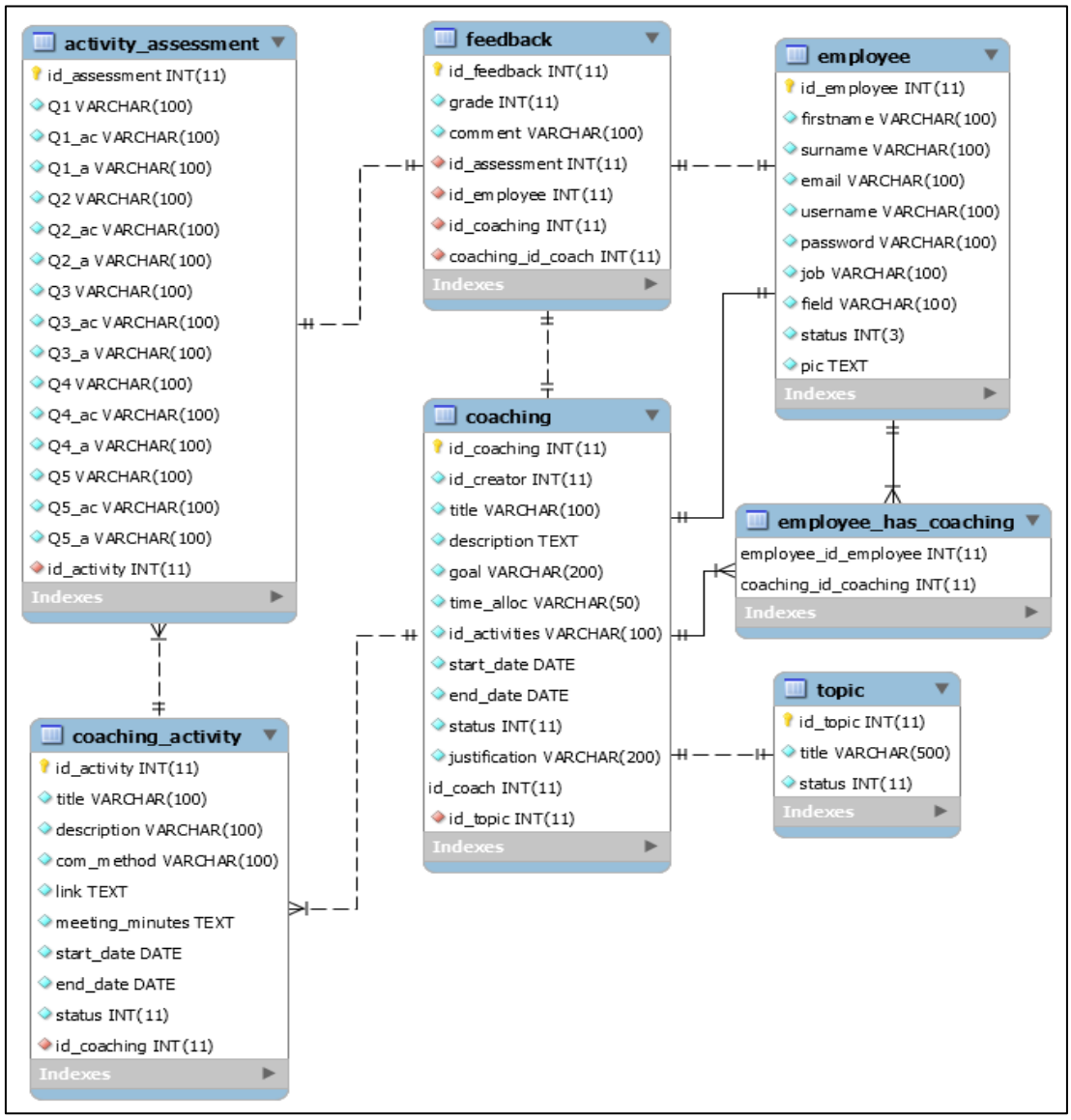

Figure 7. 4: Coaching database architecture.

Table 7. 1:Tables of the database in the coaching software demonstrator.

Table name	Function
Employee	Stores the information of each employee in the organization (Coach and Coachee)
Coaching	Stores the information of each coaching learning program
Coaching activity	Stores the information of each coaching learning program activity
Activity assessment	Stores the content of each activity assessment
Feedback	Stores each employee's feedback
Topics	Stores the coaching topics

Based on the design thinking learning program parties and activities addressed in the coaching functionality map presented in Figure 7.3, seven tables for the design thinking software demonstrator database have been created.

Figure 7.5 presents the design thinking database architecture which consists of seven main tables. The tables' functions are presented in Table 7.2. As shown in Figure 7.5, the tables are connected to each other based on the design thinking functionality map shown in Figure 7.3.

For example, all the information of the five parties participating in a design thinking workshop are stored in the stockholder's table. The employee (participant) will access the workshop which is stored in the workshop table and initiated by the Administrator. From the unified workshop, the participants start the five workshop activities (refer to Figure 6.5) which is stored in the workshop activity table. The participants start performing the activities by adding a note in each activity. The notes of each participant get stored in the notes table. The notes of all the participants in each group will be stored in the workshop activity table. As shown in the design thinking functionality map in Figure 7.3, the judges will evaluate each group outcome which will be stored in the feedback table. Also, all the participant's evaluations of the workshop will be stored in the feedback table.

All the other functions of the design thinking workshop are designed similar to the provided example.

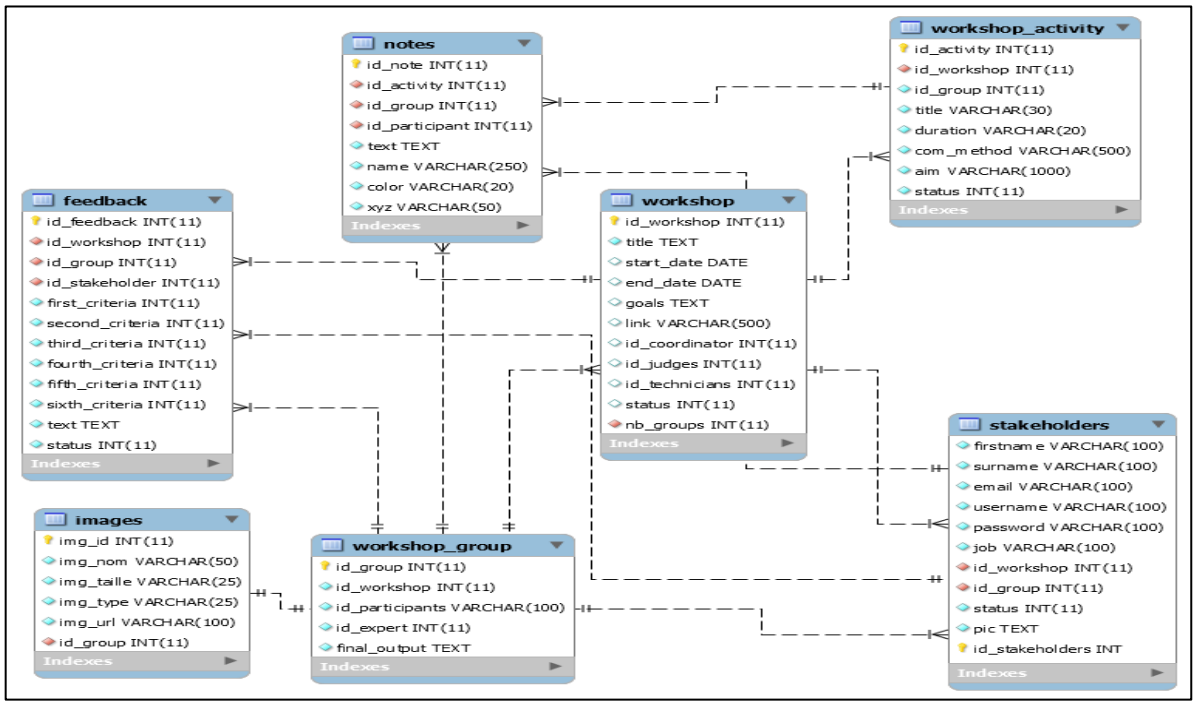

Figure 7. 5: Design thinking database architecture.

Table 7. 2: Tables of the database in design thinking software demonstrator.

Table name	Function
Stakeholders	Stores the information of each stakeholder of the design thinking workshop
Workshop	Stores the information of each workshop
Workshop Group	Stores the information of the groups in the workshop
Workshop Activity	Stores the information of each activity in the workshop
Feedback	Stores the Judge's evaluations and the feedback of each participant about the workshop
Notes	Stores the sticky notes added by participants in the workshop activities
Images	Stores the images uploaded in the Test activity.

7.2.4 System architecture of the digitalised software demonstrators

The digitalised software demonstrators are built with opensource technologies and platforms. A responsive web design was applied to deliver on desktop as well as mobile/tablet. Front-end and Middle-tier are built with the following programming languages:

- **HTML**: Consists of a standard language that is usually displayed in web browsers to describe them with some information. In other words, it has been used as front-end development or client-side. It is easy enough to write and code, currently established within the coding world and websites. It usually works together or assisted by other languages such as CSS.
- **CSS**: A computer language which is used to describe the presentation of pages written with HTML or XML. It enables the definition of layout, colours, fonts and many other visual features.
- **PHP**: It has been used for server-side development, in other words, for the system from which the page comes. It can run with a huge variety of applications and servers, enables an easy database connection and has a syntaxis highly related to other languages.

The Backend was chosen to be MySQL DB because it is easy to use, standardised within the industry world, secure, reusable, transparent and fast in any kind of complex system. Hypertext Preprocessor (PHP) was used which is a general-purpose scripting language for MySQL database.

Figure 7.6 shows the coaching system architecture. The Database is MySQL as presented in section 7.2.3 which is linked to the apache server where the MVC design pattern has been used as mentioned in section 7.2.1. The models contain the six tables presented in Table 7.1, Section 7.2.3 where the controller allows the user to update the data on the six tables in the Model based on the coaching activities and the Model transfers it to be saved in the database. The View takes the data from the Controller and produces the interface of the software to the user. The software demonstrator server can be hosted in a cloud to be used by any organization where the three participants in the coaching learning program can perform their tasks presented in section 7.2.2.1.

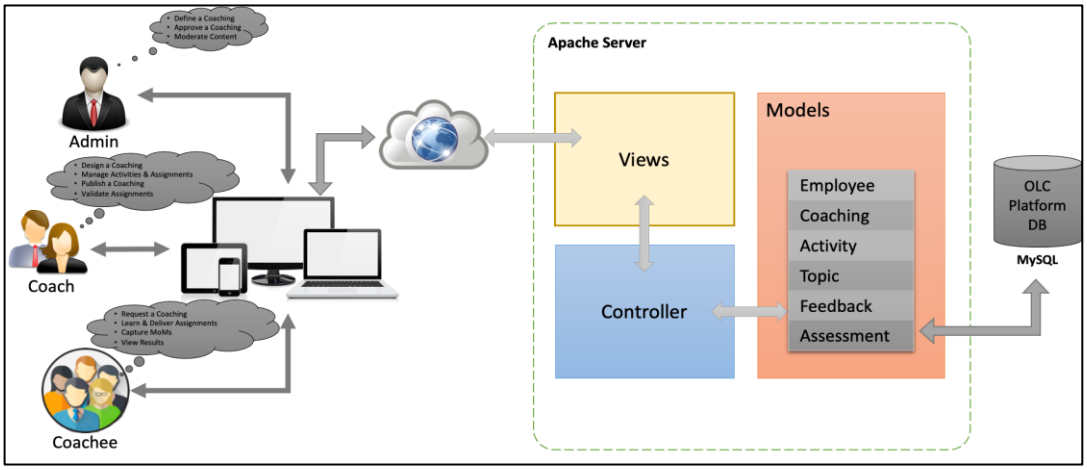

Figure 7. 6: Coaching system architecture.

Figure 7.7 shows the design thinking system architecture. The Database is MySQL as presented in section 7.2.3 which is linked to the apache server where the MVC design pattern has been used as mentioned in section 7.2.1. The models contain the seven tables presented in Table 7.2, Section 7.2.3 where the controller allows the user to update the data on the seven tables in the Model based on the design thinking activities and the Model transfers it to be saved in the database. The View takes the data from the Controller and produces the interface of the software to the user. The software demonstrator server can be hosted in a cloud to be used by organizations where the five parties in the design thinking learning program can perform their tasks presented in section 7.2.2.1.

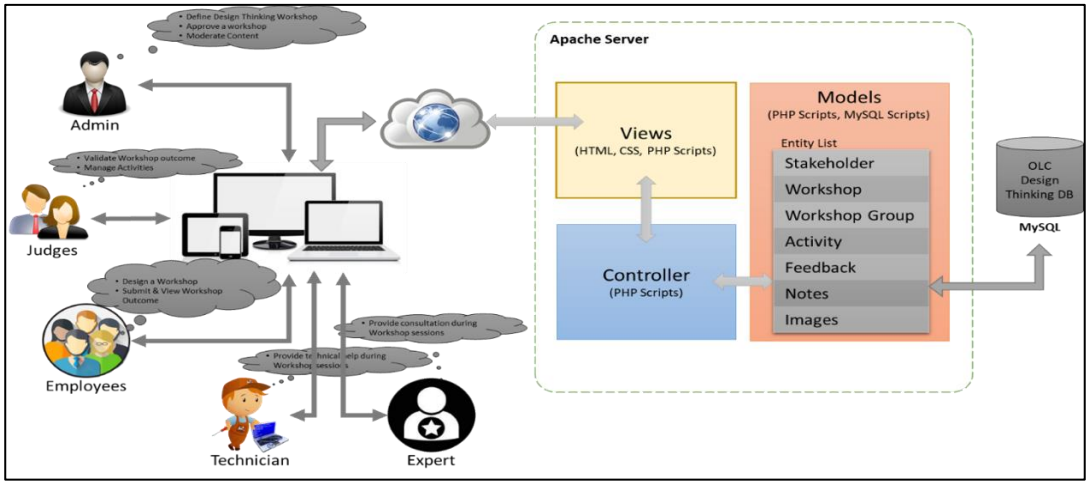

Figure 7. 7: Design thinking system architecture.

7.2.5 Coaching digitalised software demonstrator interface

The digitalised software was developed to demonstrate all the tasks of the coaching learning process presented in Figure 6.1, Section 6.2.4. The software can be used by the public services organization to perform a coaching learning program. The three participants in the coaching learning program, (i.e., the Administrator, the Coach and the Coachee), should be given access to the software to perform their tasks mentioned in section 7.2.2.1. Figure 7.8 shows the home page of the coaching digitalised software demonstrator.

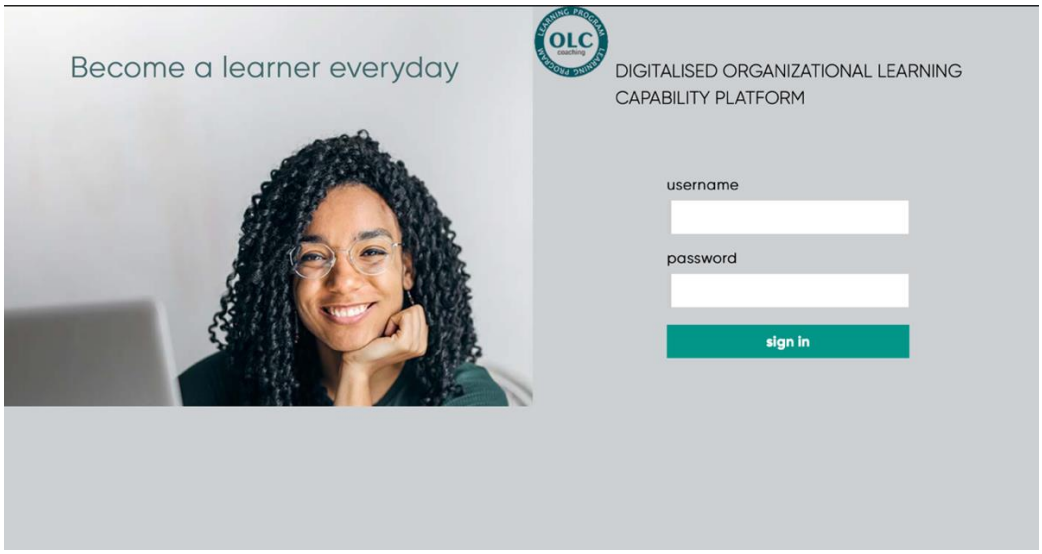

Figure 7. 8: The digitalised software demonstrator login page.

7.2.5.1 The Administrator

The Administrator is the responsible person in the Learning and Development unit within a public service organization. In order to start the coaching learning program, the Administrator will access their page as shown in Figure 7.9 and start with Task 1.1 “Defining goals and create mission statement” (see Figure 6.1) and Task 1.2 “Select an appropriate Coach from the list of Coaches” in the digitalised software demonstrator as shown in Figure 7.10. The Administrator will access “Design a new coaching learning program” where the Administrator initiates the title, defines

topics and descriptions (Task 1.1- see Figure 6.1), assigns a Coach to the Coachees (Task 1.4 - see Figure 6.1) allocating time in the E-portal (Task 1.5- see Figure 6.1), as shown in Figure 7.11. The Administrator will provide access to the software demonstrator to the Coach and Coachees. The software demonstrator provides different communication methods for both parties (Task 2.2- see Figure 6.1) and allows the Administrator to monitor the coaching learning program progress (Task 2.3- see Figure 6.1) at any time my entering the in-going coaching page and monitoring the coaching process.

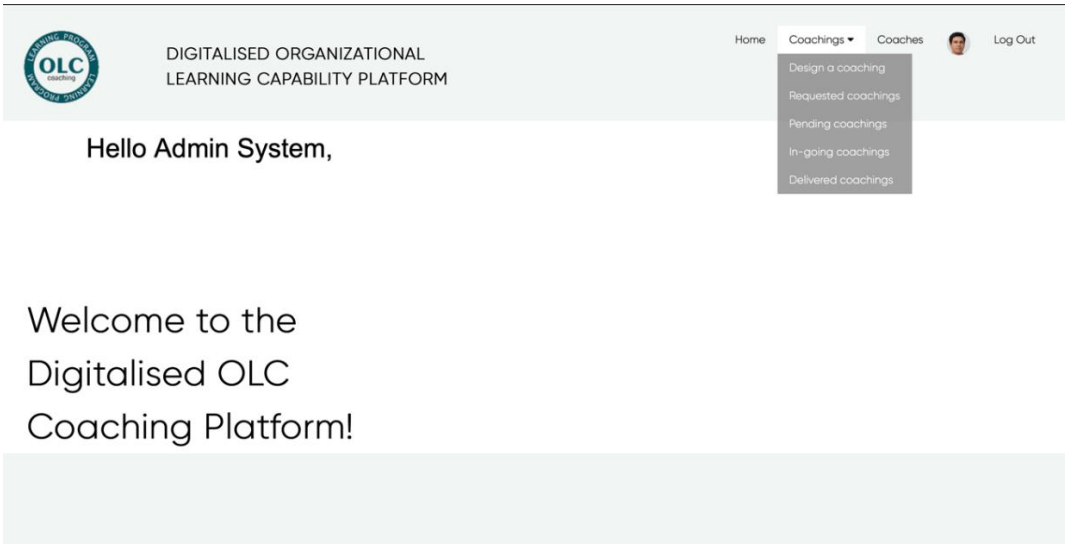

Figure 7. 9: The Administrator's homepage.

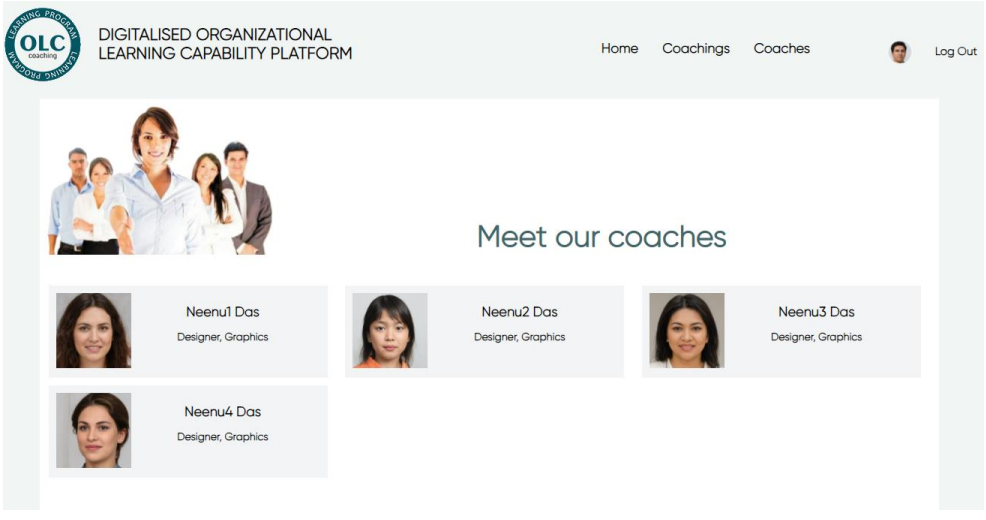

Figure 7. 10: List of Coaches.

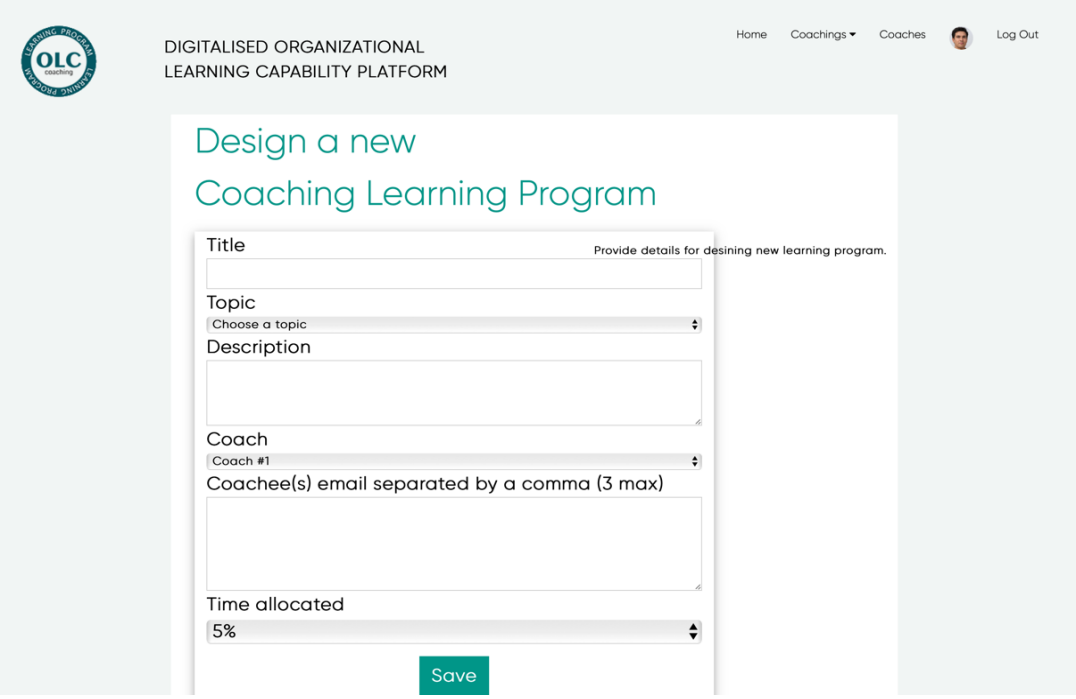

Figure 7. 11: The Administrator initiating a new coaching learning program.

7.2.5.2 The Coach

The Coach will be a certified person with certain competencies chosen by the Administrator. The Coach will access the digitalised software demonstrator as shown in Figure 7.12 based on Task 1.3 "e-certify the coaches" (see Figure 6.1). The Coach needs to be e-certified as a Coach by doing the e-certification quiz if it has not been done before as shown in Figure 7.13. If his/her result is satisfactory – higher than 8 out of 10 – he/she is certified to be a Coach as shown in Figure 7.14.

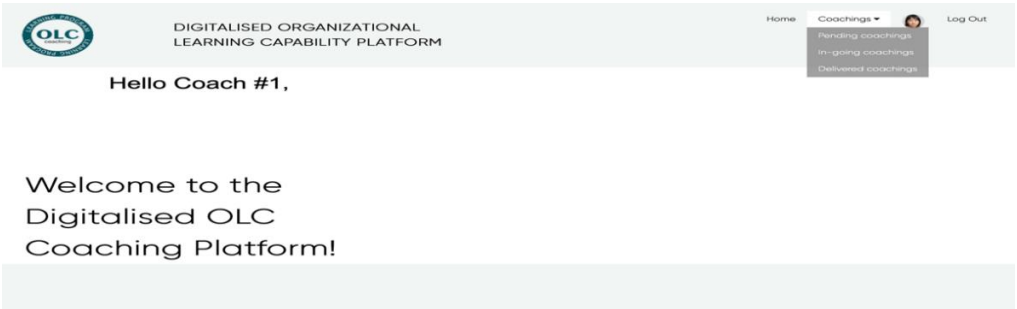

Figure 7. 12: Coach's home page.

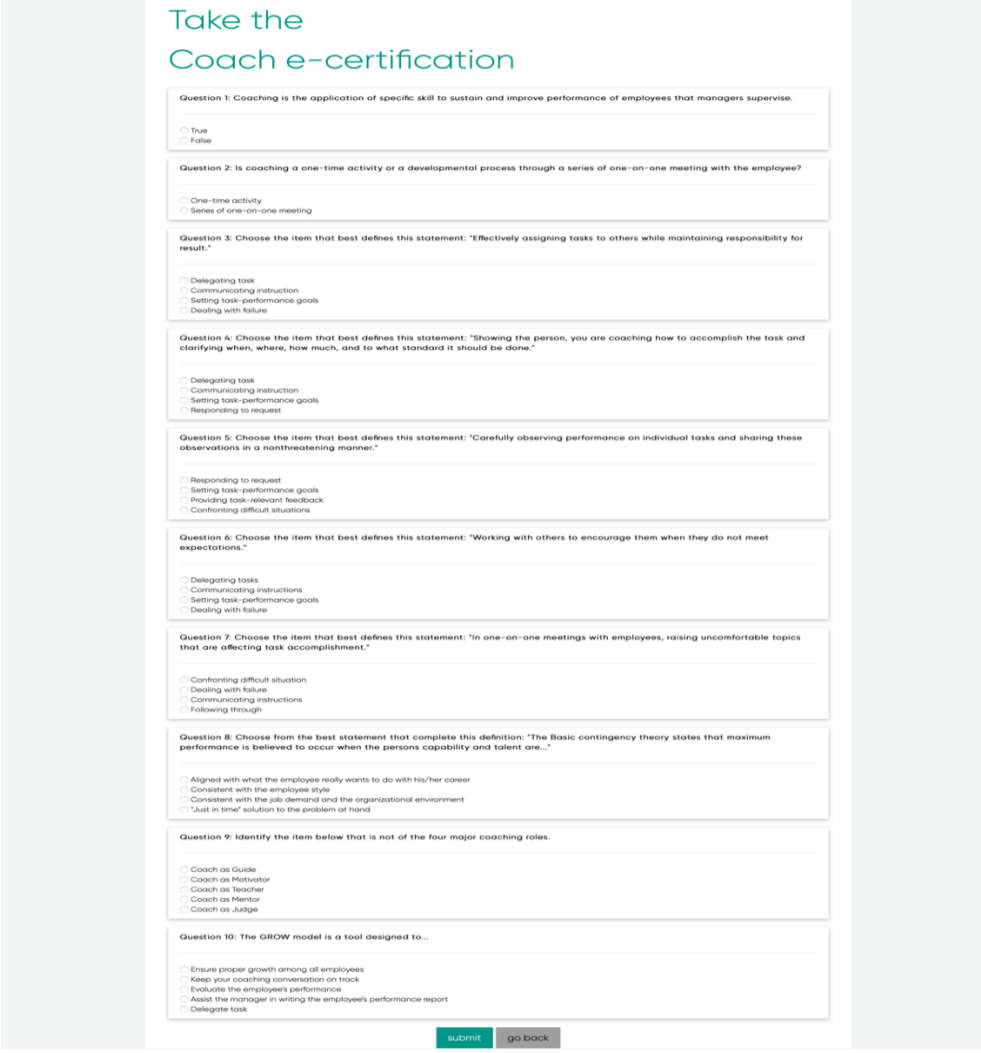

Figure 7. 13: The Coach e-certification.

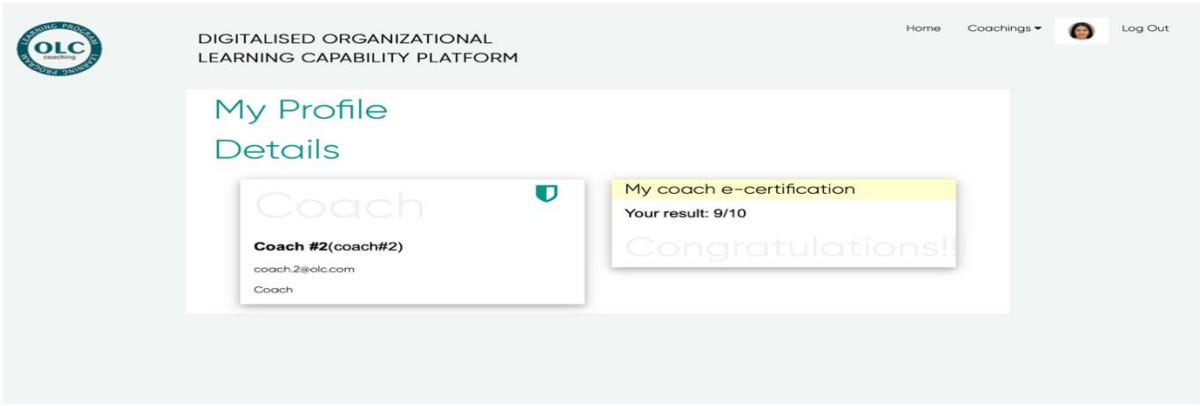

Figure 7. 14: The Coach is certified to do the coaching.

Then, the Coach accepts the coaching sent by the Administrator and defines a range of topics based on the provided description of the coaching learning program (Task 2.1- see Figure 6.1). Through the digitalised software demonstrator, the Coach starts by selecting specific topics (Task 3.1 – see Figure 6.1), making the coaching program plan (Task 3.2 – see Figure 6.1), and starting the coaching learning program using the specified communication tool (e.g., Zoom/Teams, see Task 3.3 – see Figure 6.1). Figure 7.15 shows the page where the coach defines the activities of the learning program for the Coachee, where each activity contains the title, description, communication methods and dates.

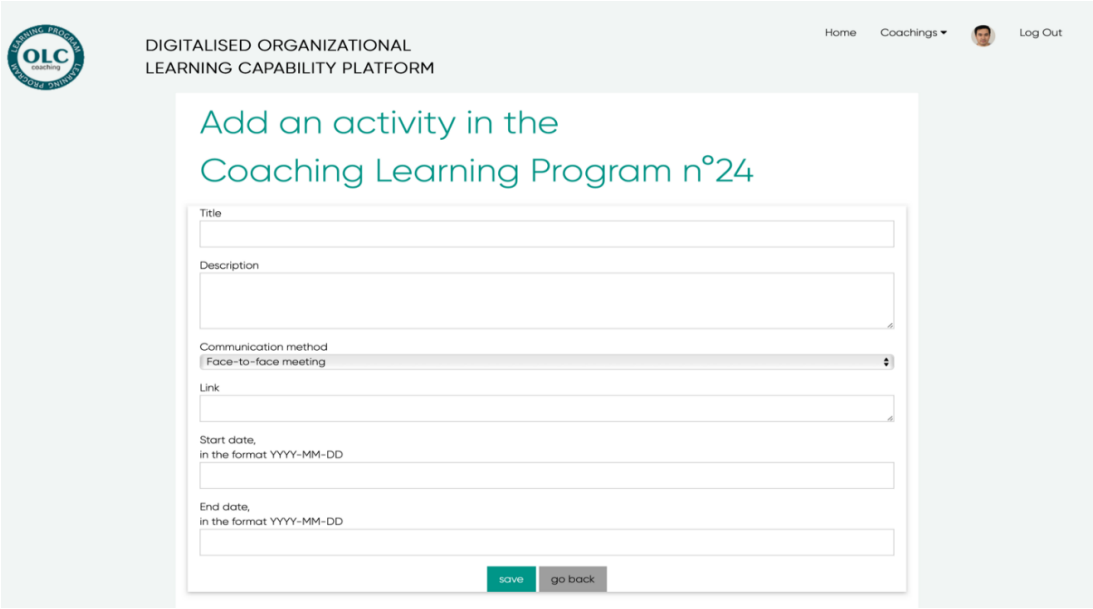

Figure 7. 15: Adding an activity into the coaching learning program.

The Coach needs to provide an assessment for all the activities in order to follow up, monitor and record the activities of the learning program (Task 3.4 – see Figure 6.1) as shown in Figure 7.16.

Figure 7. 16: The Coaching learning program activities.

7.2.6.3 The Coachee

The Coachee will be an employee within the organization who needs to be improved in a certain competency. The Coachee will access the digital software demonstrator, as shown in Figure 7.17, and will receive and complete all the activities requested by the Coach as shown in Figure 7.18. The Coachee will be requested to do the assessment provided by the Coach after each activity as shown in Figure 7.19 and Figure 7.20 as well as recording the minutes of meetings as shown in Figure 7.21.

Figure 7. 17: The Coachee's home page.

Figure 7. 18: The Coachee's in going coaching program.

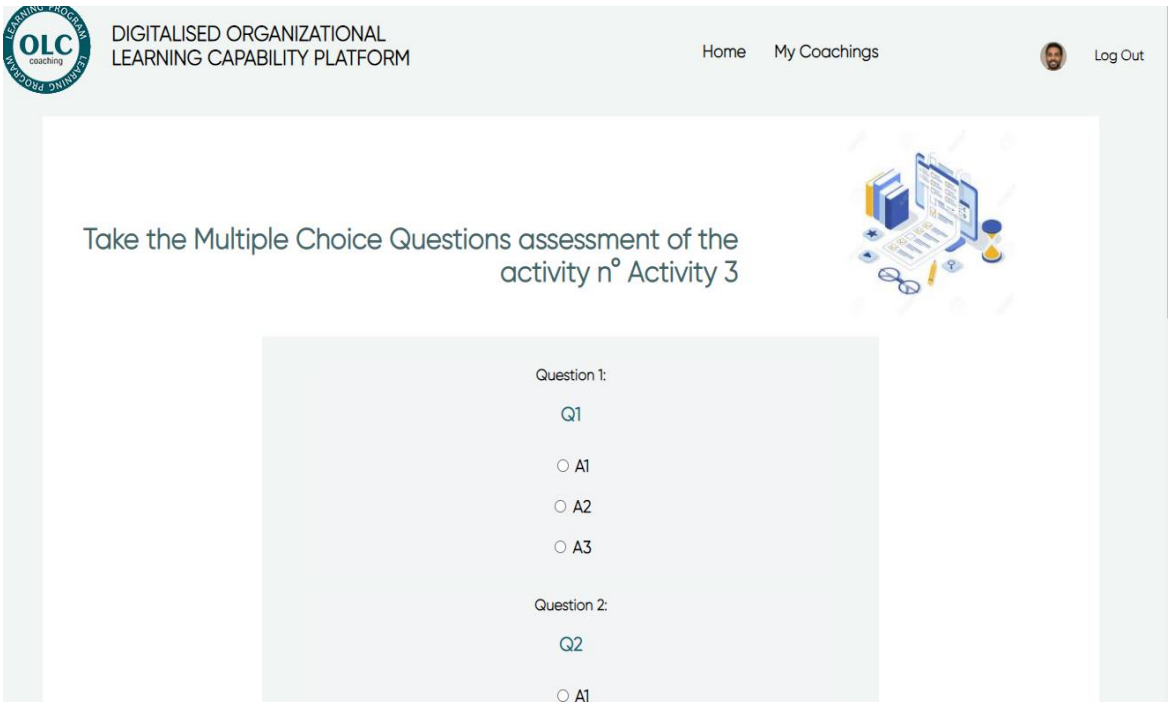

Figure 7. 19: The Coachee's assessment page.

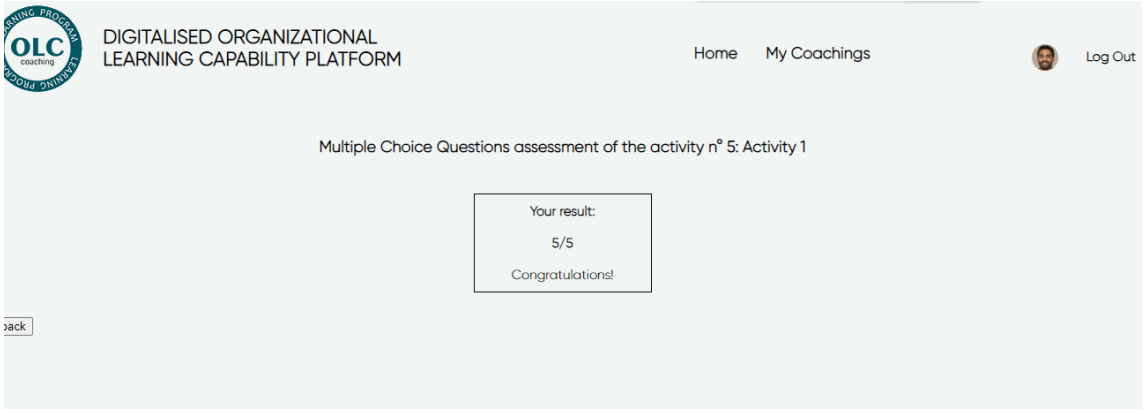

Figure 7. 20: The Coachee's assessment result.

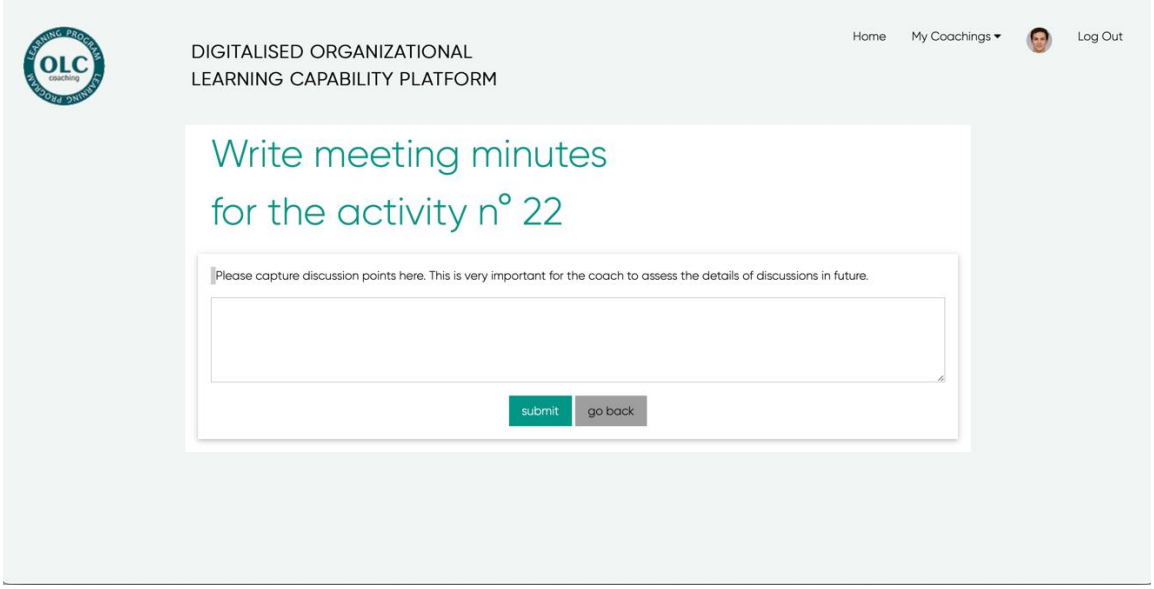

Figure 7. 21: The Coachee's meeting minutes page.

Also, the Coachee can ask for a coaching learning program, as shown in Figure 7.22, which will be sent to the Administrator for approval.

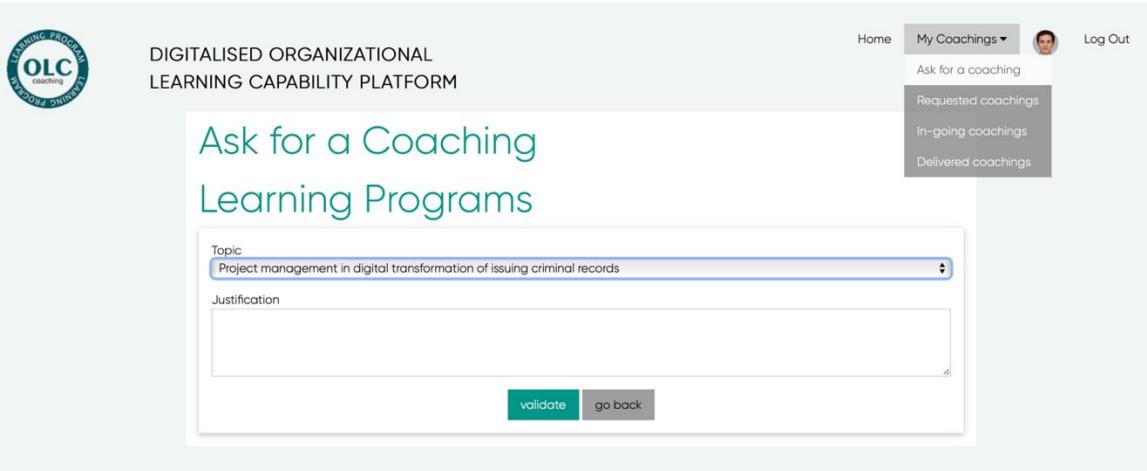

Figure 7. 22: The Coachee asks for a coaching learning program.

After completing all the activities (Task 3.5 Complete the program), the Coachee will be asked to fill an evaluation provided by the Administrator (task 4.2 Evaluate the Coach by the employees) to evaluate the coaching learning program and the Coach as shown in Figure 7.23. Also, the Coach

will assess the Coachee (task 4.1 Evaluate the employees by the coach) by the results of the assessments provided in each activity as shown in Figure 7.20.

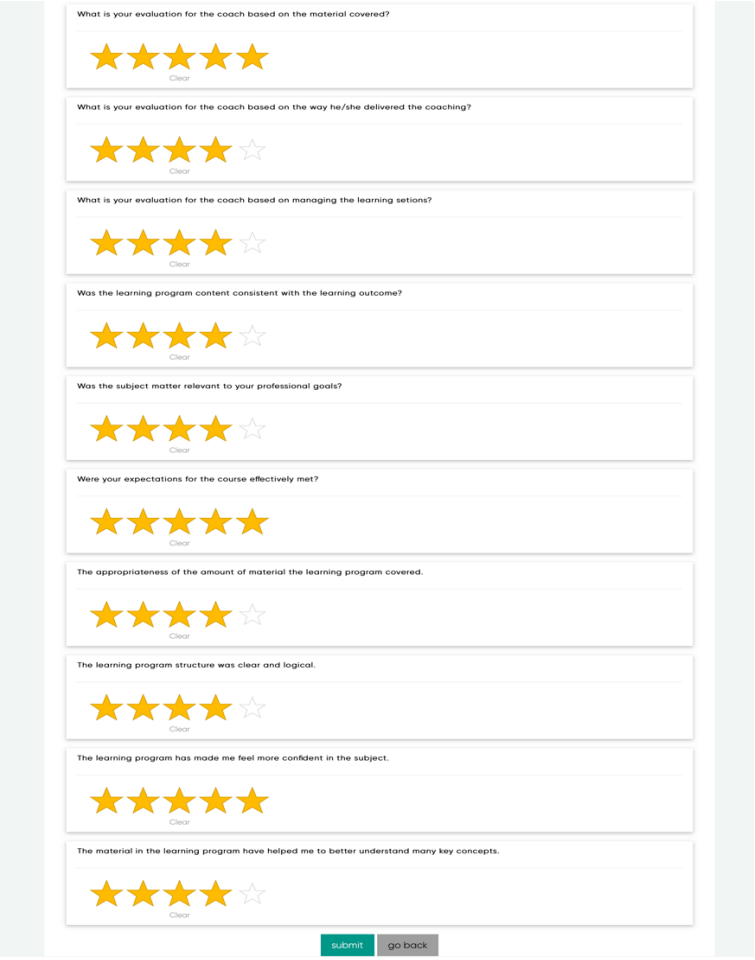

Figure 7. 23: Coachee's assessment of the Coach and the learning program.

7.2.6 Design thinking digitalised software demonstrator interface

A digitalised software demonstrator has been developed in order to facilitate performing the tasks of the Design Thinking learning program process presented in Figure 6.5 Section 6.4.3. Based on the design thinking functionality map presented in Figure 7.3 and Section 7.2.2.2 five parties were identified in order to perform the design thinking learning programs, namely Administrator, Judge, Employees (Participants), Experts and Technicians. Once the organizations decide to use the

design thinking learning programme, they should start with the planning stage of the design thinking learning process presented in Figure 6.5, section 6.4.3 and perform the following tasks:

1.1 Define the goals of the intended innovative solution.

1.2 Define the pool of potential participants.

1.3 Define the pool of the coordinator, experts, and judges.

1.4 Allocate time.

Once the planning stage is finished, the Learning and Development unit will assign a coordinator (Administrator) for the design thinking workshop based on the area of the workshop. The coordinator will start the design, deliver and evaluate stages of the design thinking learning process (refer to Figure 6.5) using the digitalised software demonstrator. The coordinator will access the software as showing in Figure 7.24 and enter initiate a new design thinking workshop page, shown in Figure 7.25, which helps the coordinator to perform the tasks of the design stage of the design thinking learning process presented in Figure 6.5, Section 6.4.3 as the following:

2.1 Determine the group size.

2.2 Select the participants and assign groups and expert.

2.3 Design digitalised communication tools.

2.4 Send the online registration.

2.5 Type of workshop delivery.

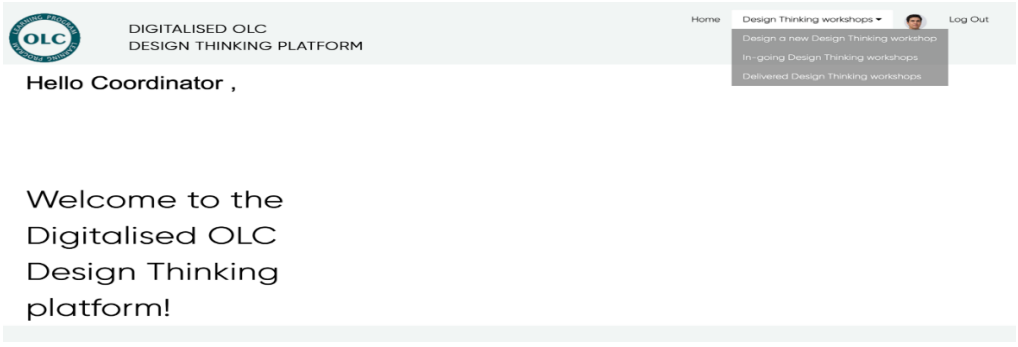

Figure 7. 24: The design thinking coordinator's homepage.

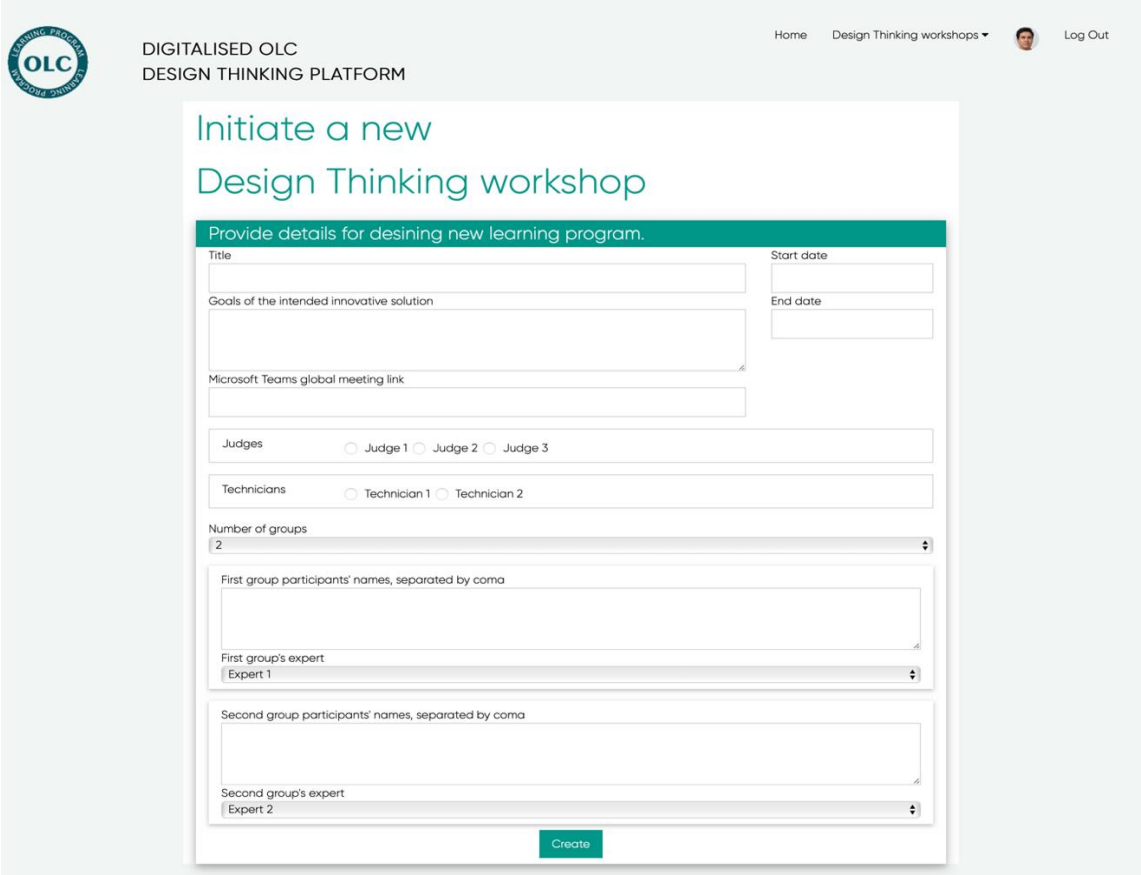

Figure 7. 25: Initiate a new design thinking workshop page.

In order to show all the elements of this digitalised software demonstrator, a design thinking workshop titled Smart Cities has been initiated as an example by the coordinator as shown in Figure 7.26.

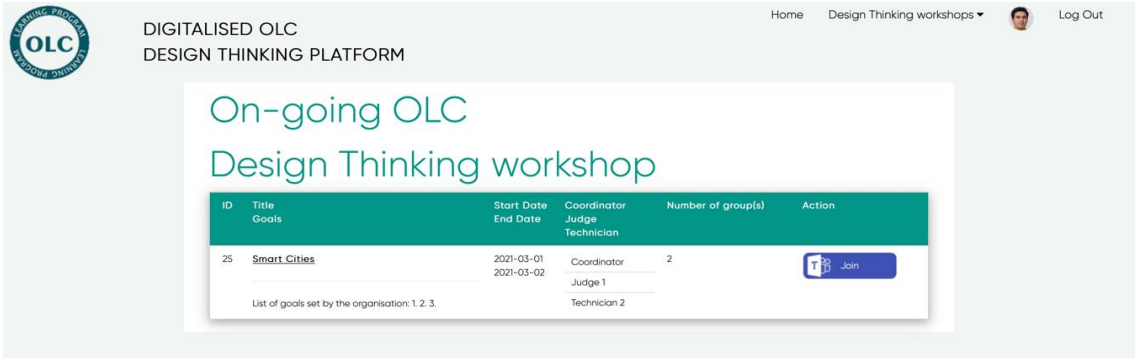

Figure 7. 26: The Coordinators have initiated a new design thinking workshop.

All the participants, experts and judges will receive the invitation through email, and they will be given an access to the software demonstrator where they can register (Task 2.4 Online Registration – see Figure 6.5). On the date of the workshop, every participant will access their page as shown in Figure 7.27 and they will access the in-going design thinking workshop. Figure 7.28 shows the in-going design thinking workshop page seen by all the participants who will access the meeting link provided in the page as shown in Figure 7.29 (Task 3.1 Provide group working space– see Figure 6.5). The coordinator will give the participants a presentation about the workshop and a tutorial on how to use the website and induct participants in the goals and objectives of the workshop (Task 3.2 Induct participants in preparation– see Figure 6.5). Once the induction is over, the coordinator will divide the participants and the experts according to the decided group via the meeting application (Microsoft Teams or Zoom meetings). The participants will access the attend the design thinking workshop and start performing the design thinking process (Task 3.3 Implement DT process - see Figure 6.5 and the explanation in Section 6.4.3) as shown in Figure 7.29.

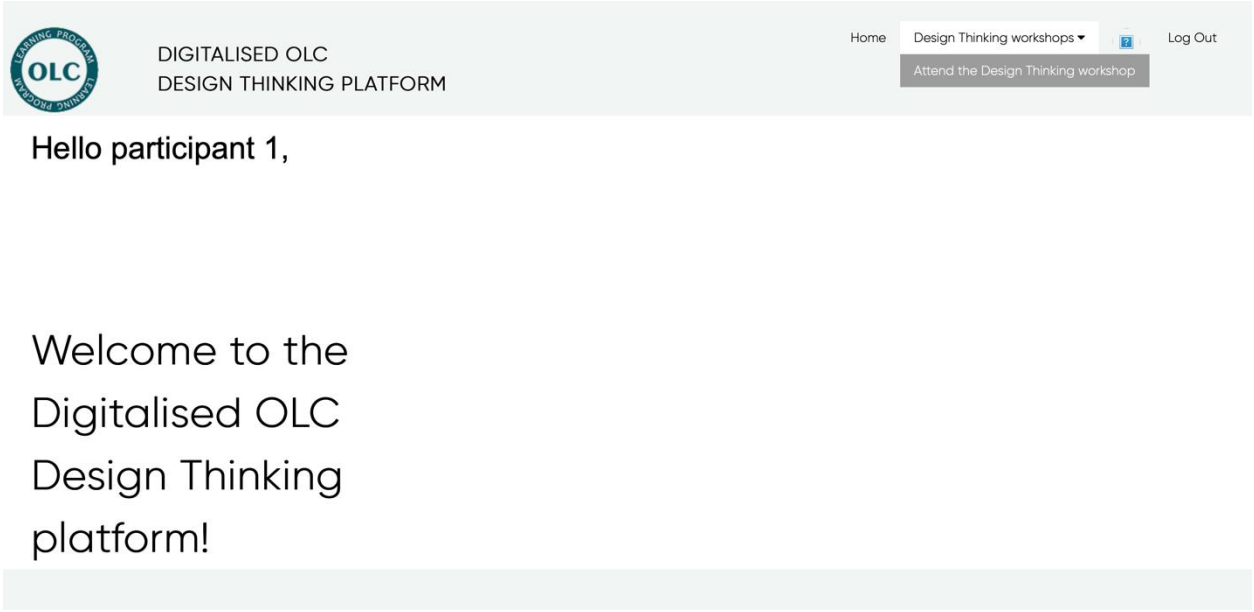

Figure 7. 27: The Participants' Homepage.

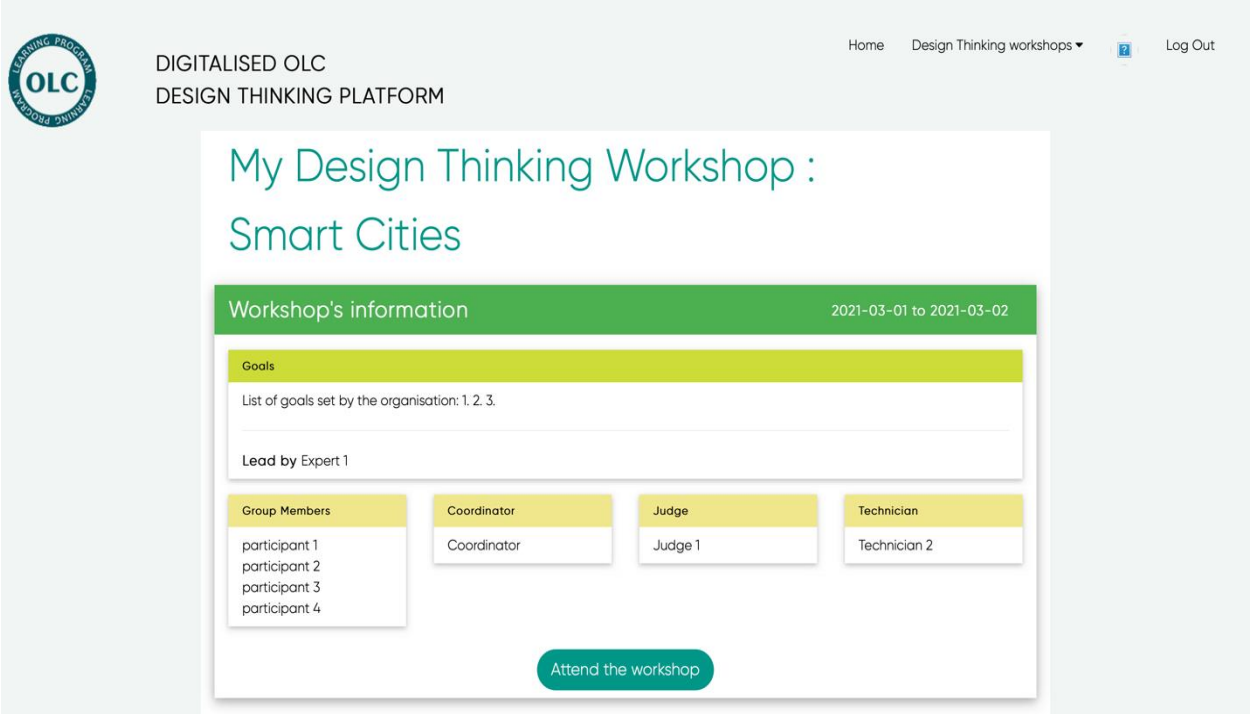

Figure 7. 28: The Participants' attend my design thinking workshop page.

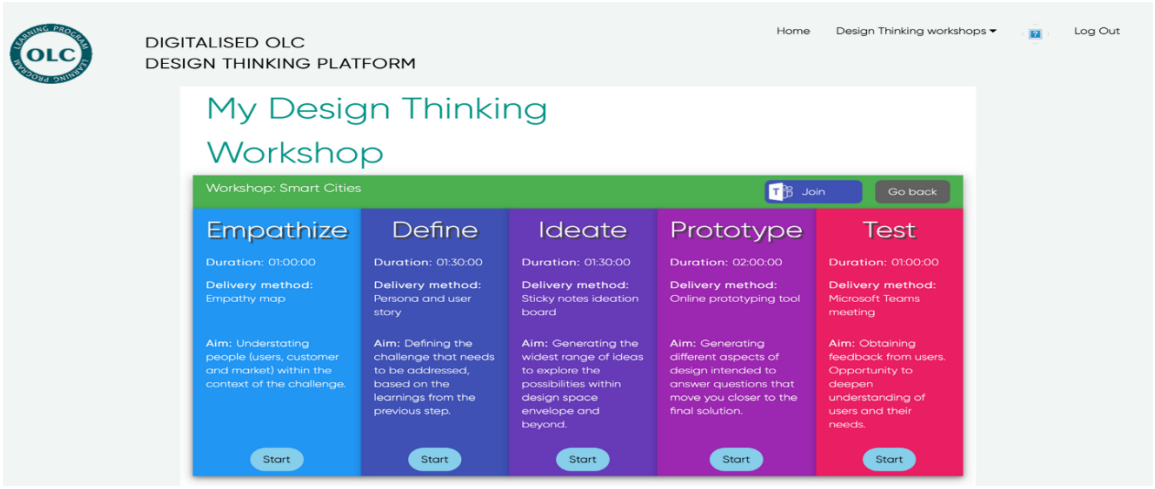

Figure 7. 29: The Participants' design thinking page.

The participants will access each activity of the design thinking process as the following:

1. **Empathize**: The participant will be asked to fill the empathy map as shown in Figure 7.30. The map will help each group to understand the goals of the workshop and get more ideas to address in the output solution.

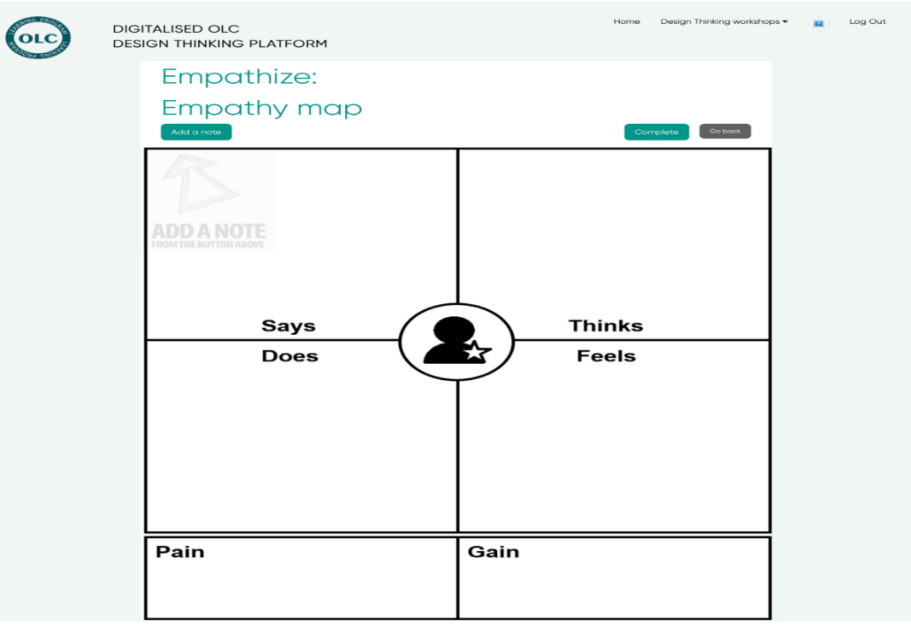

Figure 7. 30: Empathize activity page of the design thinking process.

2. **Define**: The participant will be asked to fill a Persona form as shown in Figure 7.31 which will help the participants in each group to create a real story of the customer's journey of the aimed product or services in this learning program.

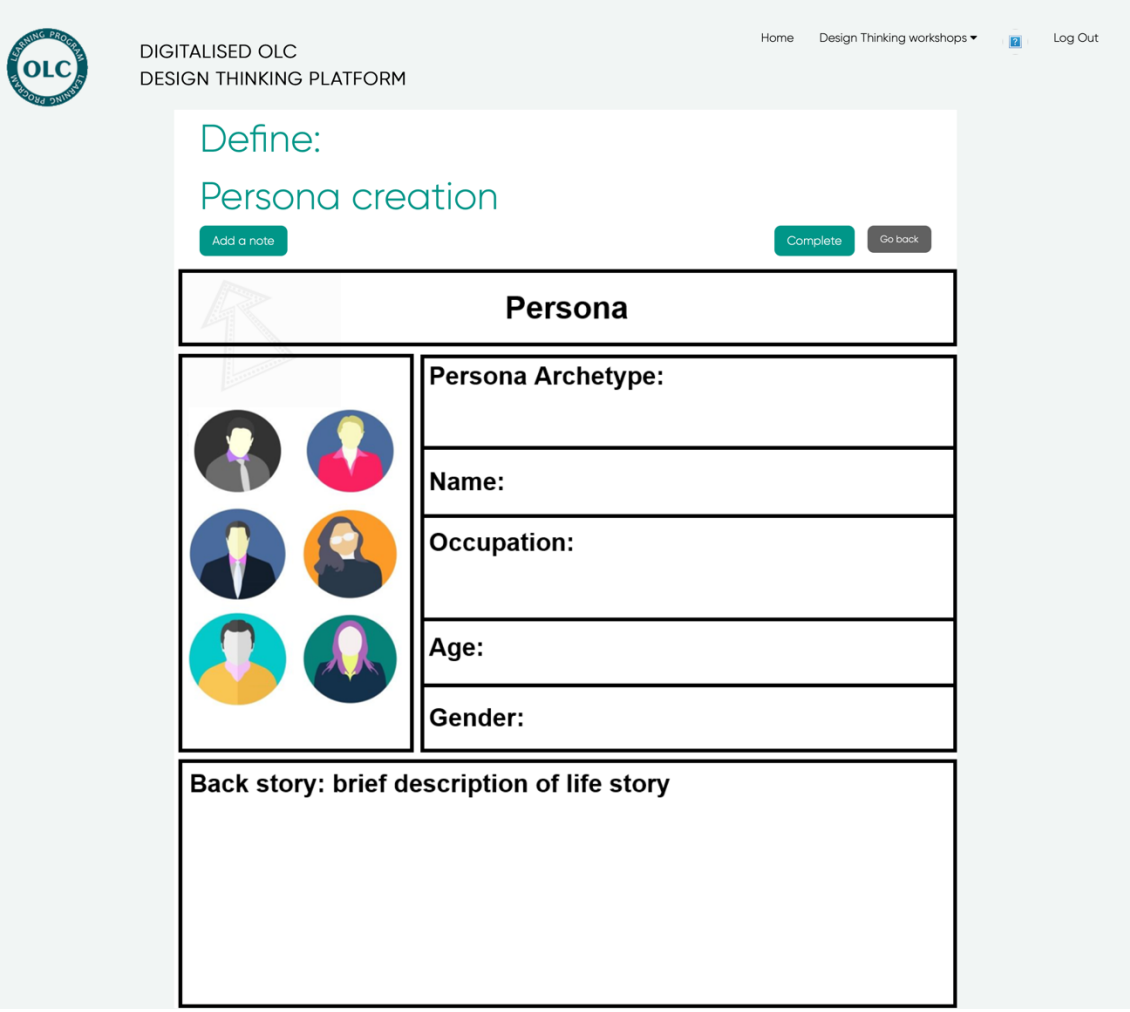

Figure 7. 31: Define activity page of the design thinking process.

3. **Ideate**: An Ideation board will be provided for the participants of each group where they can stick their ideas as shown in Figure 7.32. The board can be divided into different sections based on the aspects of the groups' ideas.

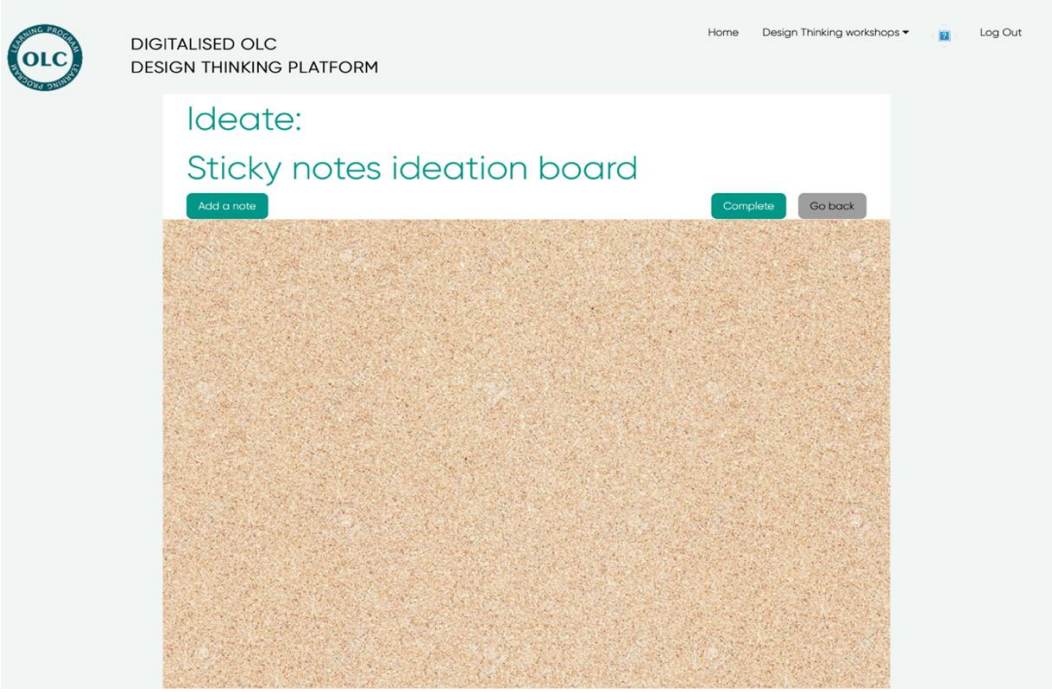

Figure 7. 32: Ideate activity page of the design thinking process

4. **Prototype**: This activity cannot be performed directly through the software demonstrator. As the innovative solution can be a product or a software or an application. The software demonstrator provides an option to upload a file on the prototype page as shown in Figure 7.33. The file can be a Microsoft PowerPoint, a Portable Document Format file (PDF), or a screenshot image.

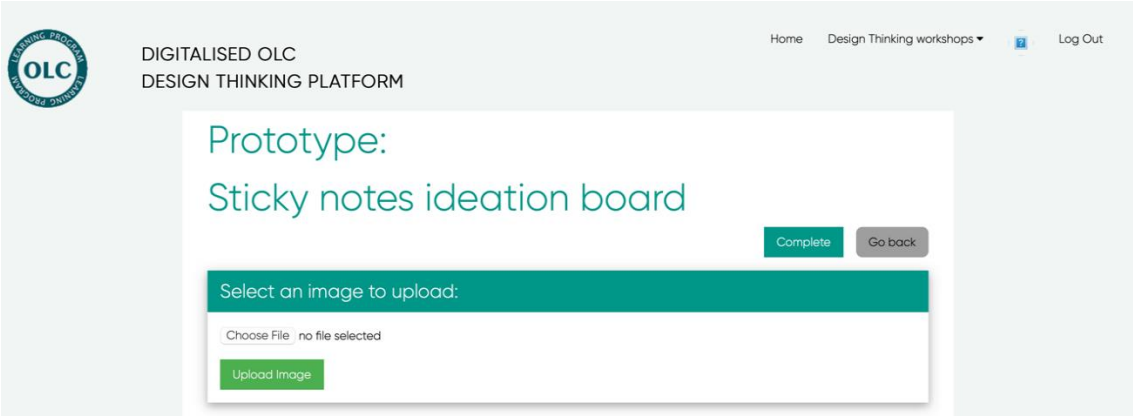

Figure 7. 33: Prototype activity page of the design thinking process.

5. **Test**: The test activity is testing of the prototype by the other participants from the other group. This activity will be done through the meeting application and the feedback of the other groups will be added in the Test page as shown in Figure 7.34.

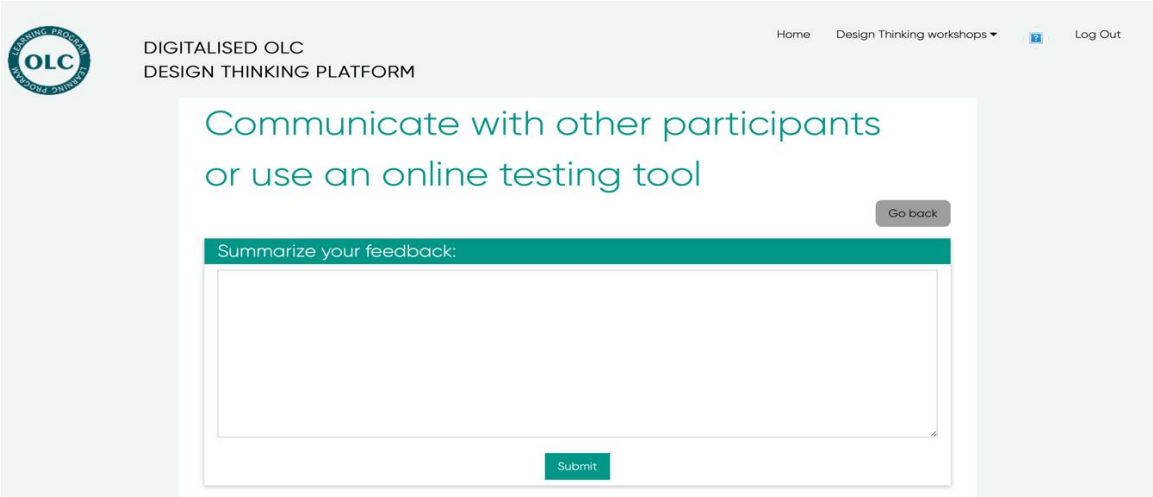

Figure 7. 34: Test activity page of the design thinking process.

The coordinator can monitor the progress of each group and participant through the software demonstrator. The software demonstrator saves all the notes written by all the participants in different colours to recognize individual participants to monitor and document the progress of each group (Task 3.4 Monitor and document the progress of each team – see Figure 6.5).

After finishing the Design Thinking process, all the groups will present their final output to the Judges via the meeting application (Task 3.5 Group presentations and findings – see Figure 6.5). The Judges will access their page as shown in Figure 7.35 and access the on-going design thinking workshop as shown in Figure 7.36. The judge will access the workshop and evaluate the output of each group as shown in Figure 7.37. The Judges will evaluate the final outputs by putting a score from 1 to 5 to several criteria as shown in Figure 7.38 (Task 3.6 Evaluate the outputs by the judges and select the optimal solution – see Figure 6.5).

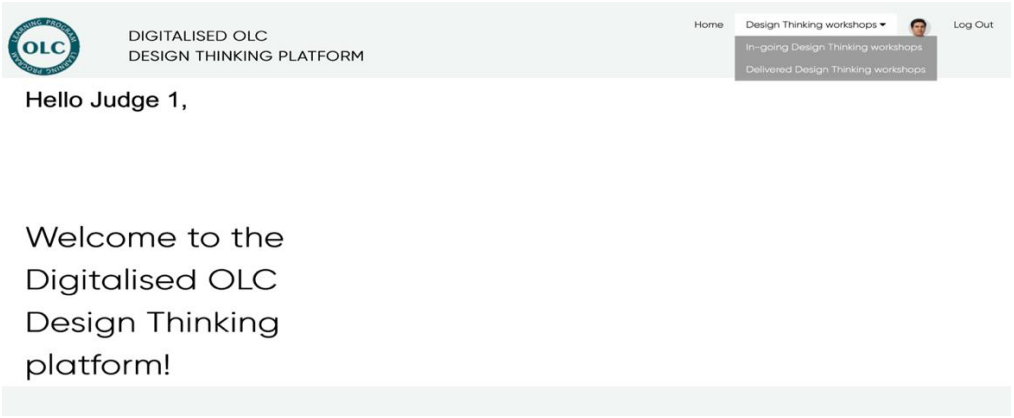

Figure 7. 35: The Judge's homepage.

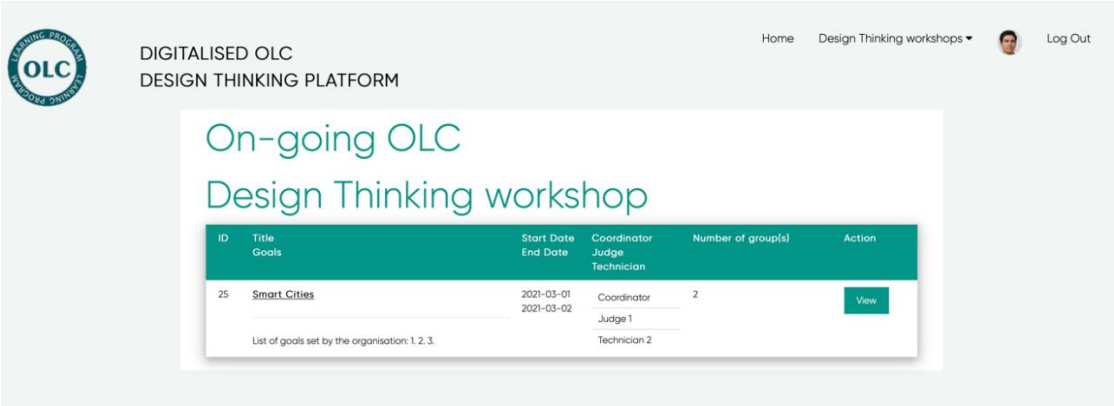

Figure 7. 36: The Judge's on-going OLC design thinking workshop page.

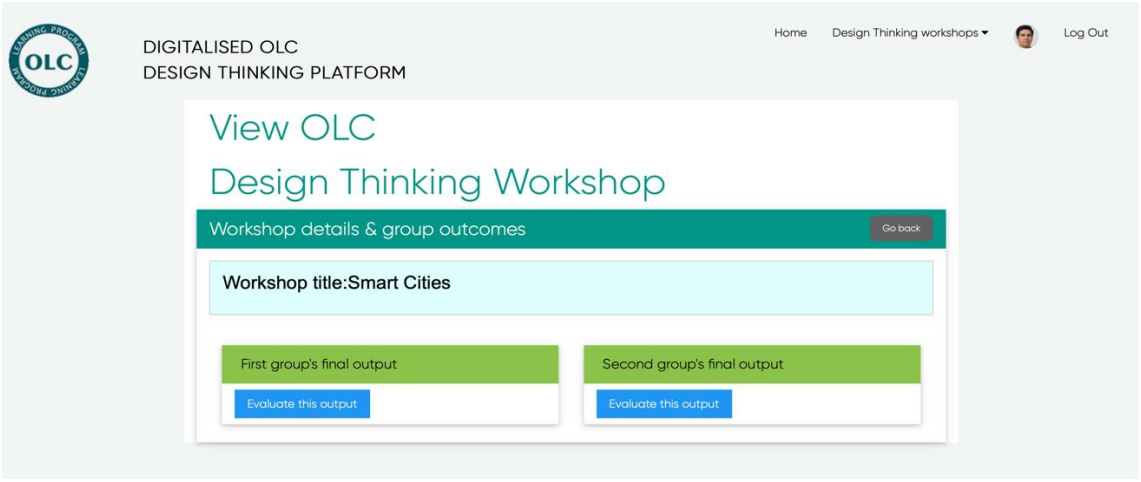

Figure 7. 37: The output of all the groups page.

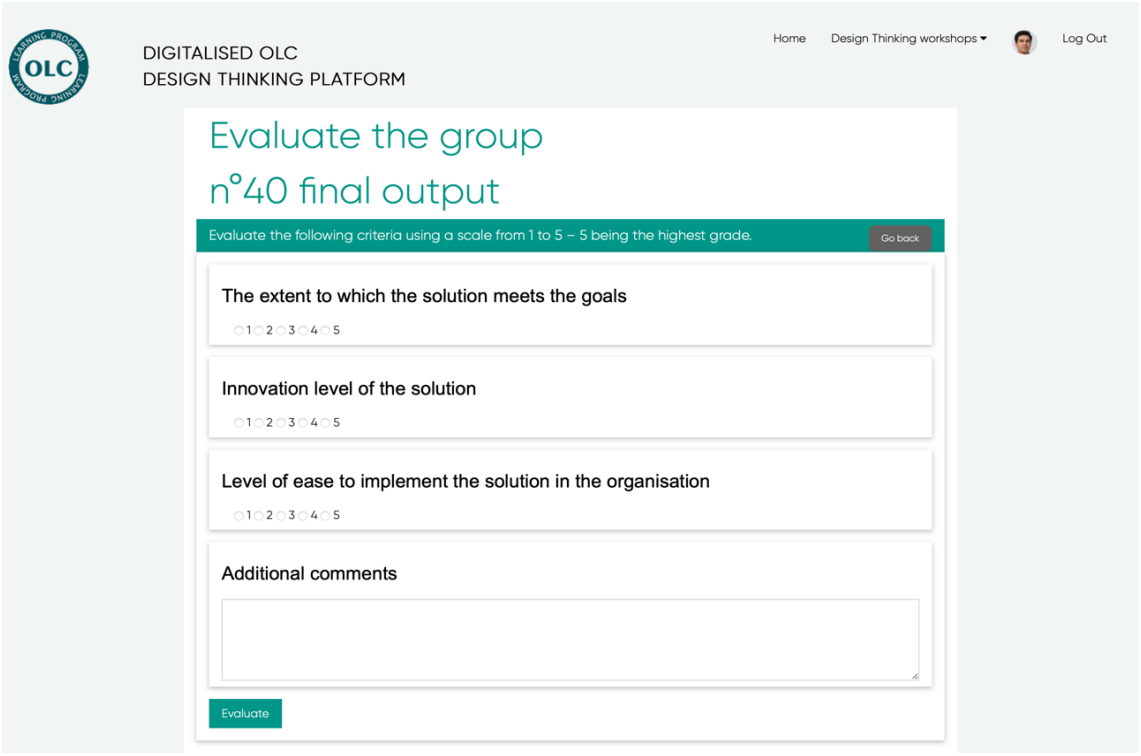

Figure 7. 38: The Judge's evaluation page

The group with the highest score will be the winning group as shown in Figure 7.39.

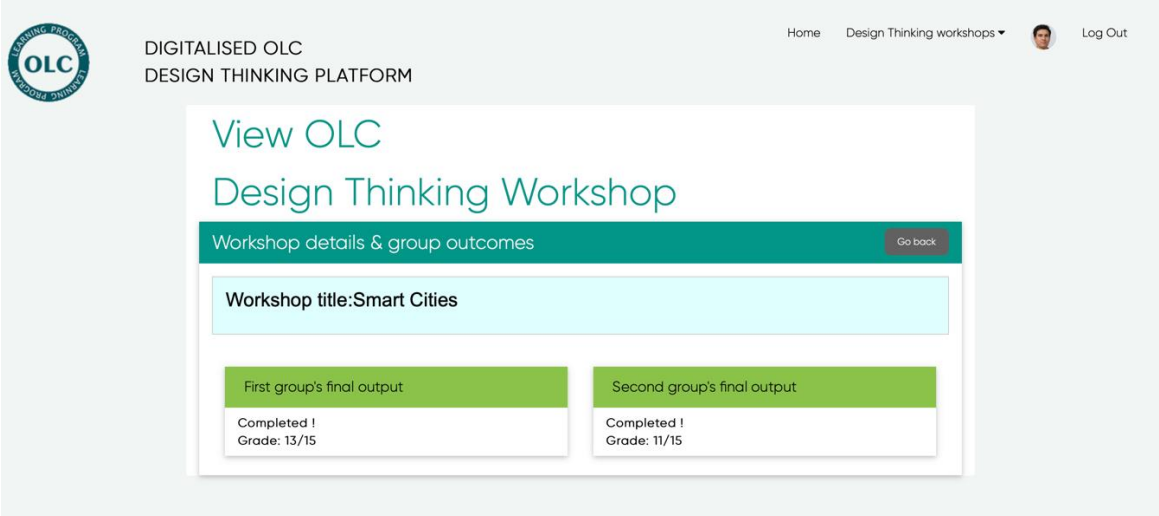

Figure 7. 39: The Groups' evaluation scores by the Judge.

After finishing the activities of the workshop, an evaluation box will appear for all the participants to evaluate the workshop as shown in Figure 7.40 and Figure 7.41 (Task 4.1 Evaluate the workshop by participants – see Figure 6.5).

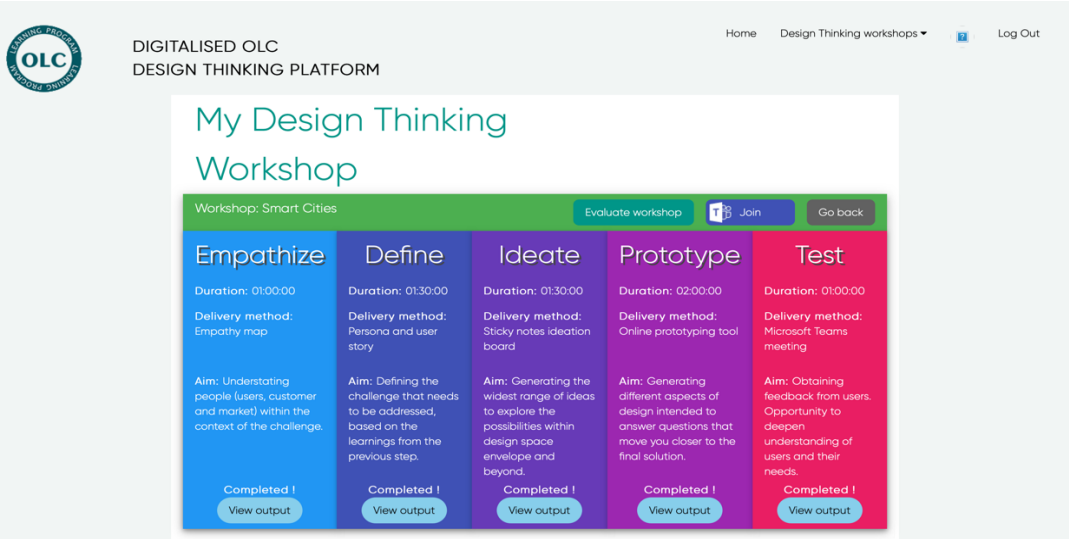

Figure 7. 40: Participants' completion page.

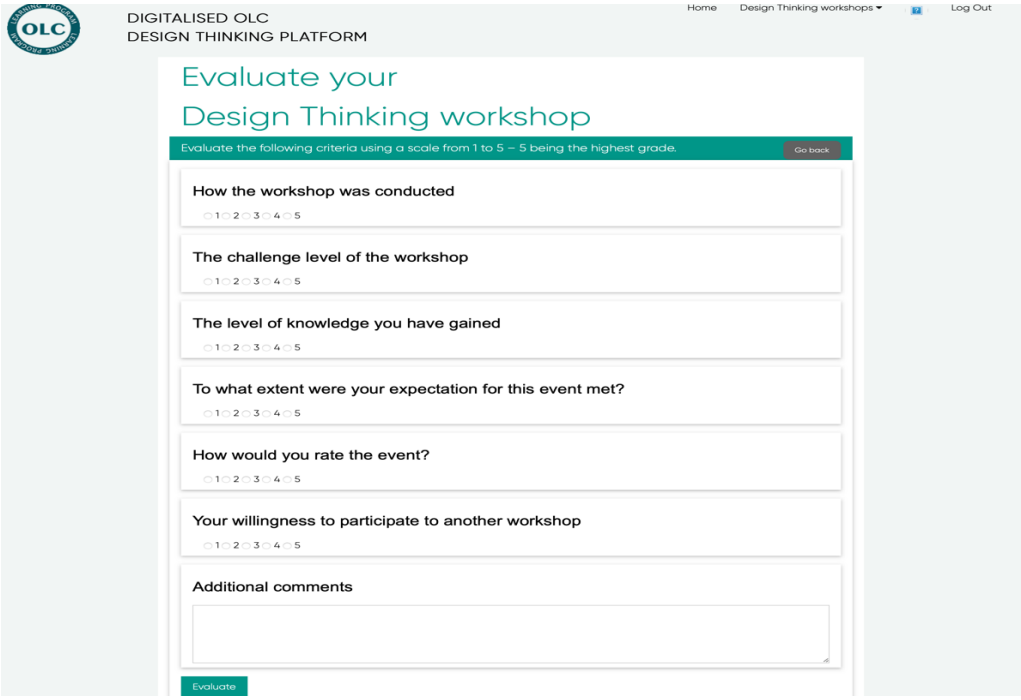

Figure 7. 41: Participants' evaluation page.

In order to improve the winning innovative solution, any required resources will be allocated within 3 months (Task 4.2 Allocate time and resources – see Figure 6.5). After having defined several new versions of the solution, the Judges will access the features of the final new solution and do Task 4.3 evaluating the final functional prototype of the selected solution (refer to Figure 6.5).

Approximately 6 months after implementing the improved solution, the Judges will evaluate the outcomes based on the targeted goals and measure the success of the innovation of the selected solution (Task 4.4 – see Figure 6.5).

Chapter 8: Case Study Validations of Coaching and Design Thinking Learning Programs and Expert judgment Evaluation

8.1 Introduction

This chapter presents two case study validations of the coaching learning program process presented in Figure 6.1 Section 6.2.4 and the design thinking learning program process presented in Figure 6.5, Section 6.4.3. The two digitalised software demonstrators presented in Chapter 7 have been used in both case studies. Also, this chapter presents the expert judgment evaluation of the OLC model and sub-models proposed in this thesis.

8.2 Case Studies validations

In order to validate the learning programs proposed in this thesis, a public service organization in the United Arab Emirates has been approached to perform the case studies. The OLC model, OLC sub-models and the digitalised software demonstrators have been presented in detail to the organization. The organization agreed to perform the coaching learning program and the design thinking learning program using the digitalised software demonstrators in the organization as case studies for this research. The Learning and Development unit within the organization were chosen to look after the case studies and give feedback after performing them.

8.2.1 Coaching learning program to enhance project management competency; case study validation

A case study about coaching learning program was performed using the digital software demonstration (presented in section 7.2.5) in order to validate the coaching learning process presented in Figure 6.1 Section 6.2.4. The case study was about performing a coaching learning program to enhance the competency of project management for two employees. The case study focussed on three parties: the Administrator, which was the Learning and Development department in the organization, the Coach and the two Coachees (as in the functionality map in Figure 7.2). The developed model was presented to the Learning and Development department in the organization, and they chose two employees from the Human Resources department and the IT

department to be Coachees. The Coach was the head of the governance department in the organization, who has several certifications in project management, managed more than 15 projects in the organization and has more than 15 years of experience. The Learning and Development department decided to apply the coaching learning program over eight weeks. In order to use the digital software demonstrator, the three parties in the case study attended several sessions on how to use the software and were given access to the digitalised software demonstrator as shown in Table 8.1.

Table 8. 1: The participants in the case study

	Participant	Username
The Administrator	The coordinator from the Learning & Development department	Admin
The Coach	Head of the Governance department	Coach#1
Coachee 1	An employee from the IT department	Coachee#1
Coachee 2	An employee from the Human Resources department	Coachee#2

To start the coaching learning program, the Administrator accessed their page and designed a new coaching learning program by initiating the title, topic, description, Coach and Coachees as shown in Figure 8.1.

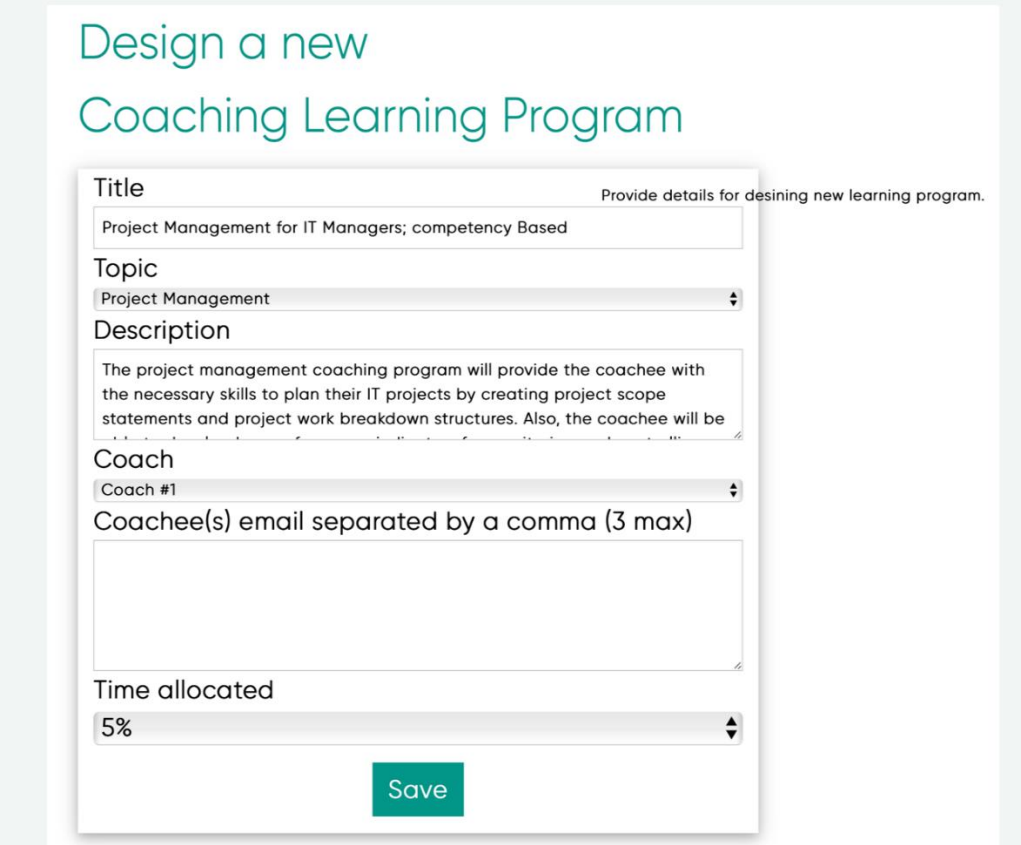

Figure 8. 1: Coaching case study: The Administrator initiating a new coaching learning program.

The Administrator chose the appropriate Coach from the list of Coaches in the digitalised software demonstrator as shown in Figure 8.2.

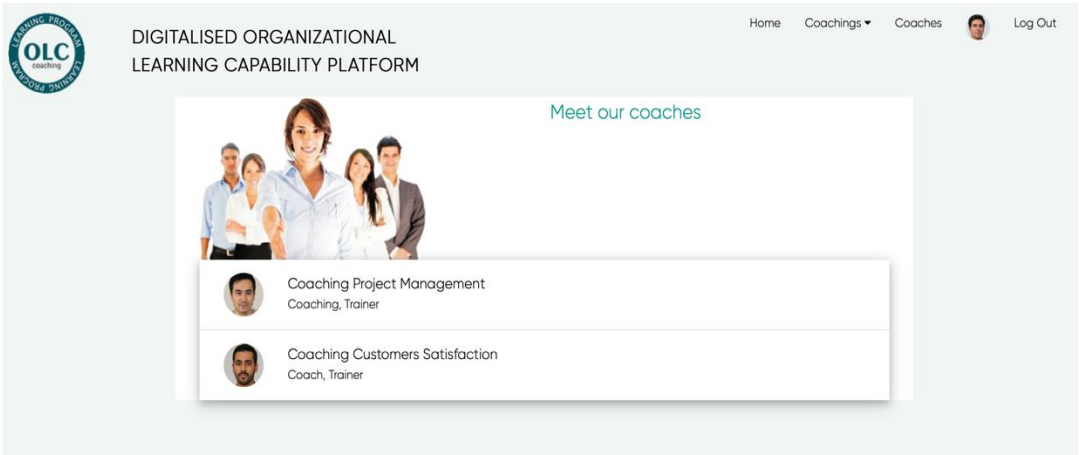

Figure 8. 2: Coaching case study: List of coaches.

The Coach loged into the software demonstrator. Before starting, the Coach had to be e-certified as a Coach by doing the e-certification quiz. Once the Coach became certified to do the coaching as shown in Figure 8.3, the Coach accepted the coaching request sent by the Administrator and started defining the activities of the learning program for the two Coachees. The Coach set seven activities for each Coachee as shown in Figure 8.4. Activities one and seven were delivered face to face, while the others were through video conference application. The Coach created an assessment for each activity to assess the learning of each activity.

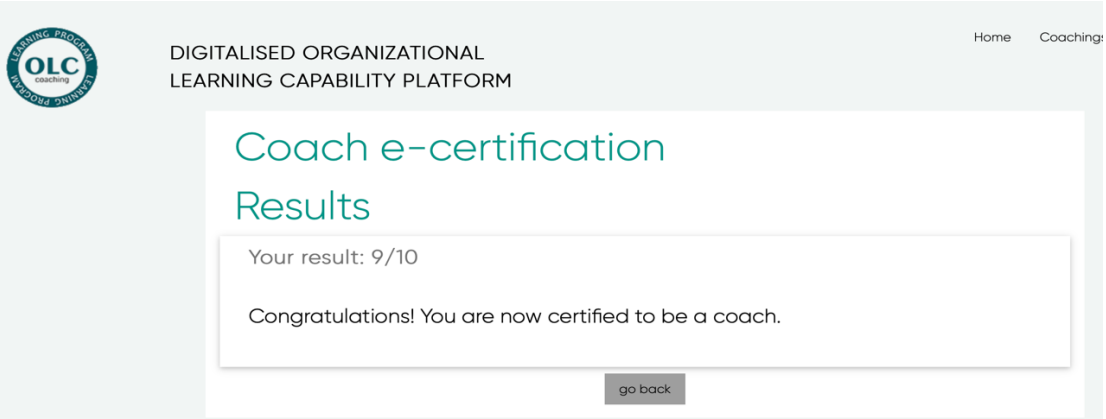

Figure 8. 3: Coaching case study: The Coach e-certification.

Figure 8. 4: Coaching case study: The activities set by the Coach for Coachee#1.

The Coachees accessed the digital software demonstrator to receive and complete all the activities from the Coach as shown in Figure 8.5. The Coachees were requested to do the

assessment provided by the Coach after each activity as shown in Figure 8.6 and they were asked to fill in the minutes of meetings as shown in Figure 8.7.

Figure 8. 5: Coaching case study: Coachee#2's in-going coaching learning program page.

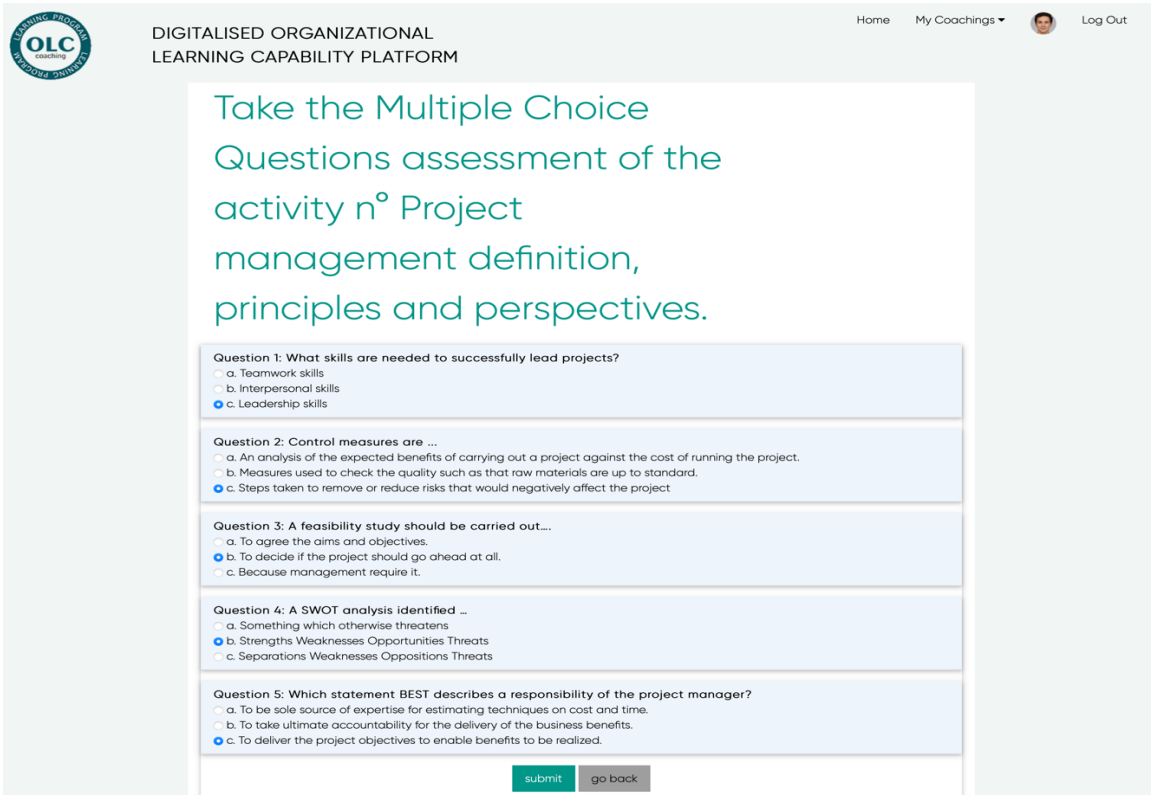

Figure 8. 6: Coaching case study: Coachee #2's assessment for activity #1.

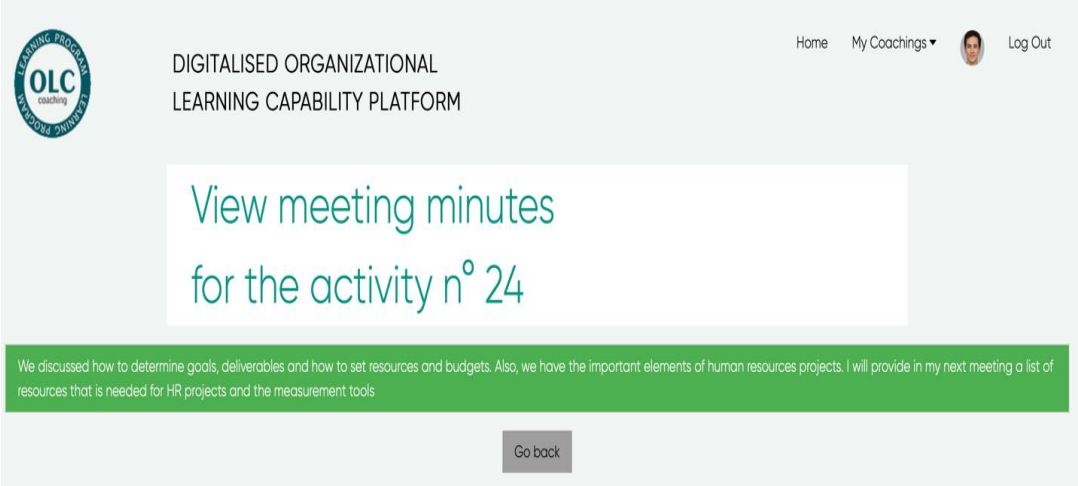

Figure 8. 7: Coaching case study: Coachee #1's meeting minutes for activity #5.

As proposed in the coaching learning program (refer to Figure 6.1) the coaching learning program will be evaluated based on three tasks:

1. Evaluate the Coachee by the coach: this has been done through the results of the assessments of each activity in the learning program and the Coach provides a report about the Coachee.
2. Evaluate the Coach by the employees; After finishing all the activities, the Coachees were asked to fill an evaluation provided by the Administrator to evaluate the coaching learning program and the Coach. Figure 8.8 shows the evaluation questions provided by the Administrator.
3. Measure the impact on performance after 3 months: this will be done by measuring the impact on the Coachee's work according to their managers and productivities and strategic KPIs of their units.

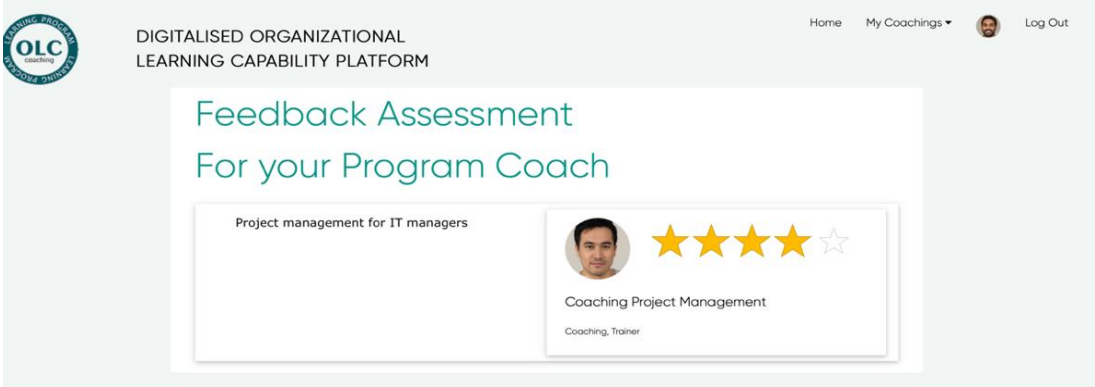

Figure 8. 8: Coaching case study: The Coachees evaluate the Coach and the learning program.

8.2.2 Design thinking learning program case study validation

The United Arab Emirates government launched an e-government strategy which aims to transfer all the services they provide to smart services (https://u.ae/en/information-and-services#/). The public service organizations started to provide most of their services within the government's smart portal and set a plan to transfer other services in the upcoming period. As the design thinking learning program process presented in Figure 6.5 Section 6.4.3 was introduced by the author to the organization, the organization agreed to apply the design thinking learning program to the process of reporting cases in a police station, as this service is planned to be transferred to a smart service. The digitalised software demonstrator of the design thinking presented in Section 7.2.6 was agreed to be used by the organization to deliver the learning program in this case study.

As shown in the design thinking learning process (refer to Figure 6.5) the first stage is to plan, so the organization had to define the goals of the intended innovative solution as the following:

1. To digitalise the process of reporting cases in the police station.
2. Avoid human contact during the process.
3. To reduce waste and save time.
4. To increase customer's satisfaction.
5. To automate documentation.

After setting the goals for a smart police station, the organization chose a coordinator (Administrator) for the learning program and they defined the pool of potential participants who

should participate in the design thinking workshop. The organization decided to invite participants from Public Prosecution, investigators from police stations, the IT department, the strategy and quality department and people from the community. Then, the organization defined the pool of Experts and Judges. Because of the COVID 19 situation where most of the organizations were working at distance, the organization decided to perform the case study as a pilot. The organization chose only one group to participate in the case study and measure the impact of this pilot to be used in their future work. Therefore, the organization contacted the chosen department and organization to nominate a participant to take part in the workshop.

The coordinator logged into the software demonstrator and initiated a new design thinking workshop titled Smart Police Station as shown in Figure 8.9. Table 8.2 shows all the parties who had been chosen by the organization and invited to participate in this case study (as presented in the design thinking functionality map in Figure 7.3).

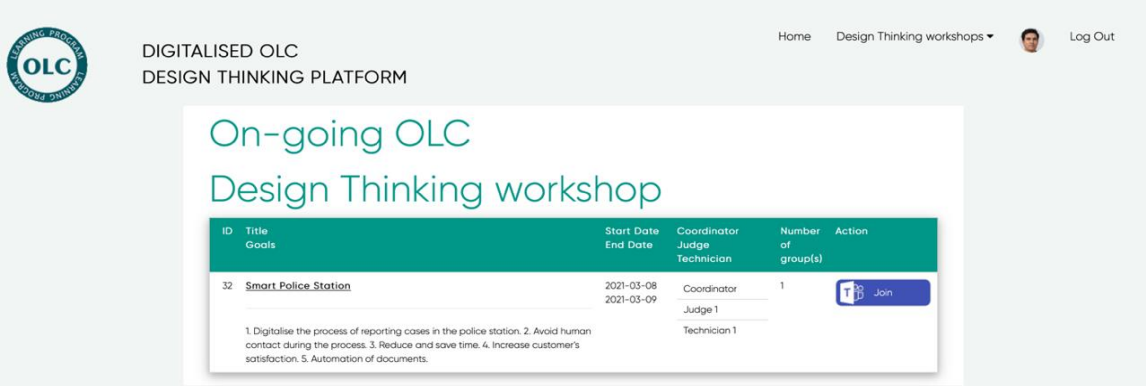

Figure 8. 9: Design thinking case study: The coordinator initiated smart police station workshop.

Table 8. 2: All parties participating in the case study

	Invitees	Username
Coordinator	Head of Learning and Development department.	coordinator
Judges	1. The General Director of Policing Operation. 2. The Deputy Director of Strategy and Performance Development.	Judge 1
Expert	Commander of Comprehensive Police Station.	Expert 1
Group 1 (Participants)	Participants from the public prosecution.	Participant 1
	Investigator from police station.	Participant 2
	IT expert from the organization.	Participant 3
	Person from the community who reported cases in the last three years.	Participant 4
	Employees from the strategy and quality department in the organization.	Participant 5

All the participants received an email with the date of the workshop and their usernames. Therefore, on the date of the workshop, the participants logged onto the software and opened the on-going design thinking workshop. As shown in Figure 8.10 each participant found the details of the workshop, the name of the other participants and the expert in his/her group. The participants entered the 'attend the workshop' icon where they find a Zoom meeting link as shown in Figure 8.11. The participants joined the Zoom meeting where the coordinator gave a presentation about the workshop and the goals. The participants were assigned to a planned group headed by the

assigned expert and they were asked to start the design thinking workshop as shown in Figure 8.11.

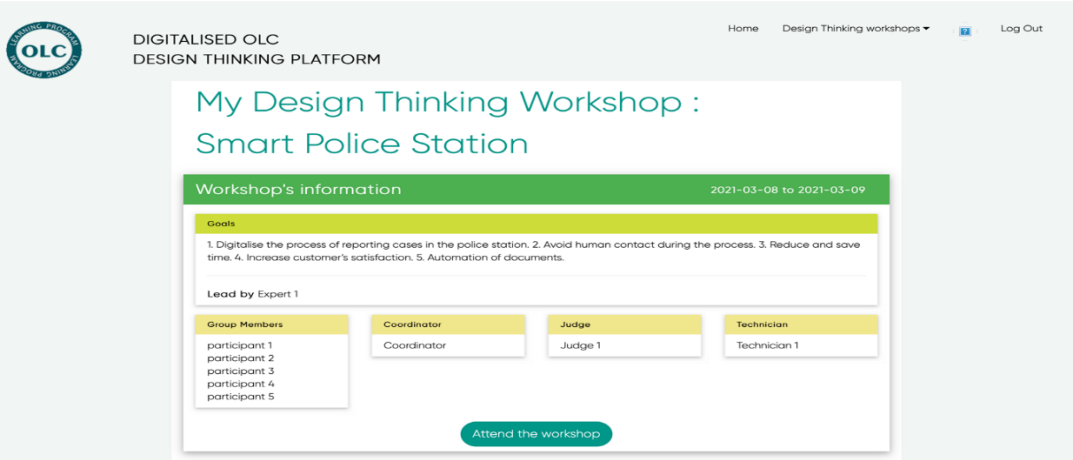

Figure 8. 10: Design thinking case study: Participants on-going design thinking workshop page.

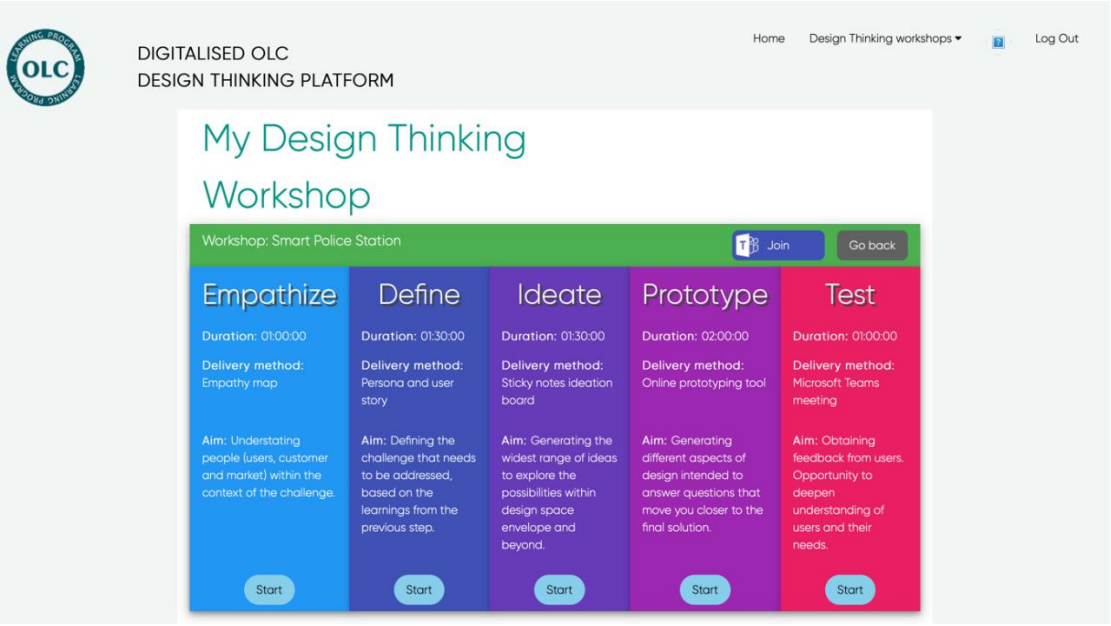

Figure 8. 11: Design Thinking case study: Participants workshop page.

The participant in each group starts the workshop with the empathize activity. Each participant provided his/her ideas by sticking note in the required field. Figure 8.12 shows the output of this activity where each note colour belongs to a single participant.

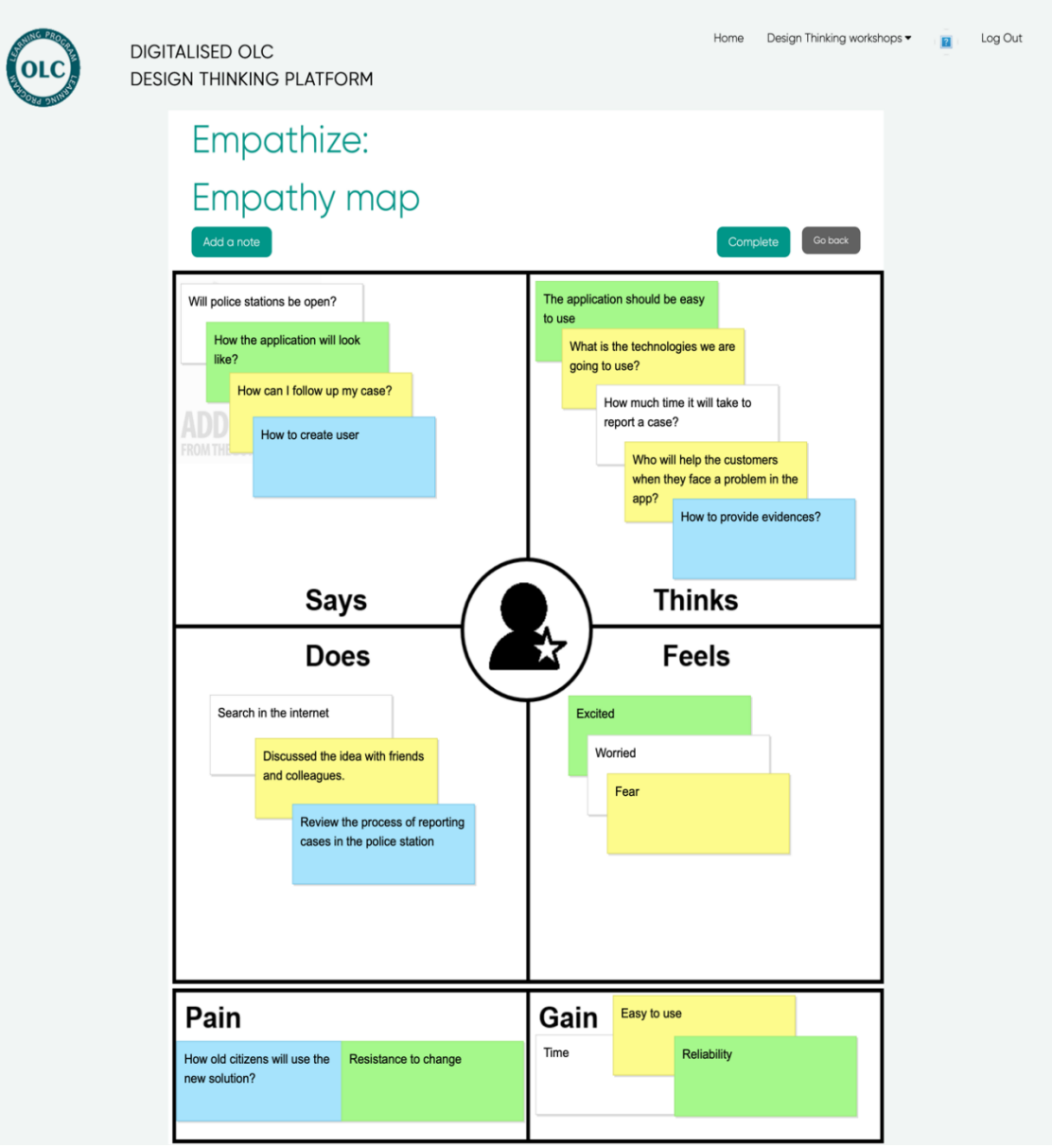

Figure 8. 12: Design thinking case study: The output of the Empathise activity.

Once the empathise activity finished, the participants started the define activity. In this activity, the participants were asked to fill the Persona form where they chose “Saeed Sultan”; an Emirati citizen who owns a rental car company. He has reported more than three cases in the last two years. To report a case in a police station, “Saeed” had to go to the police station, then fill

several forms about himself, then went to the waiting area until he was assigned to an investigator. After meeting the investigator, he waited for the investigation paper to be printed to sign them. The output of this activity is shown in Figure 8.13.

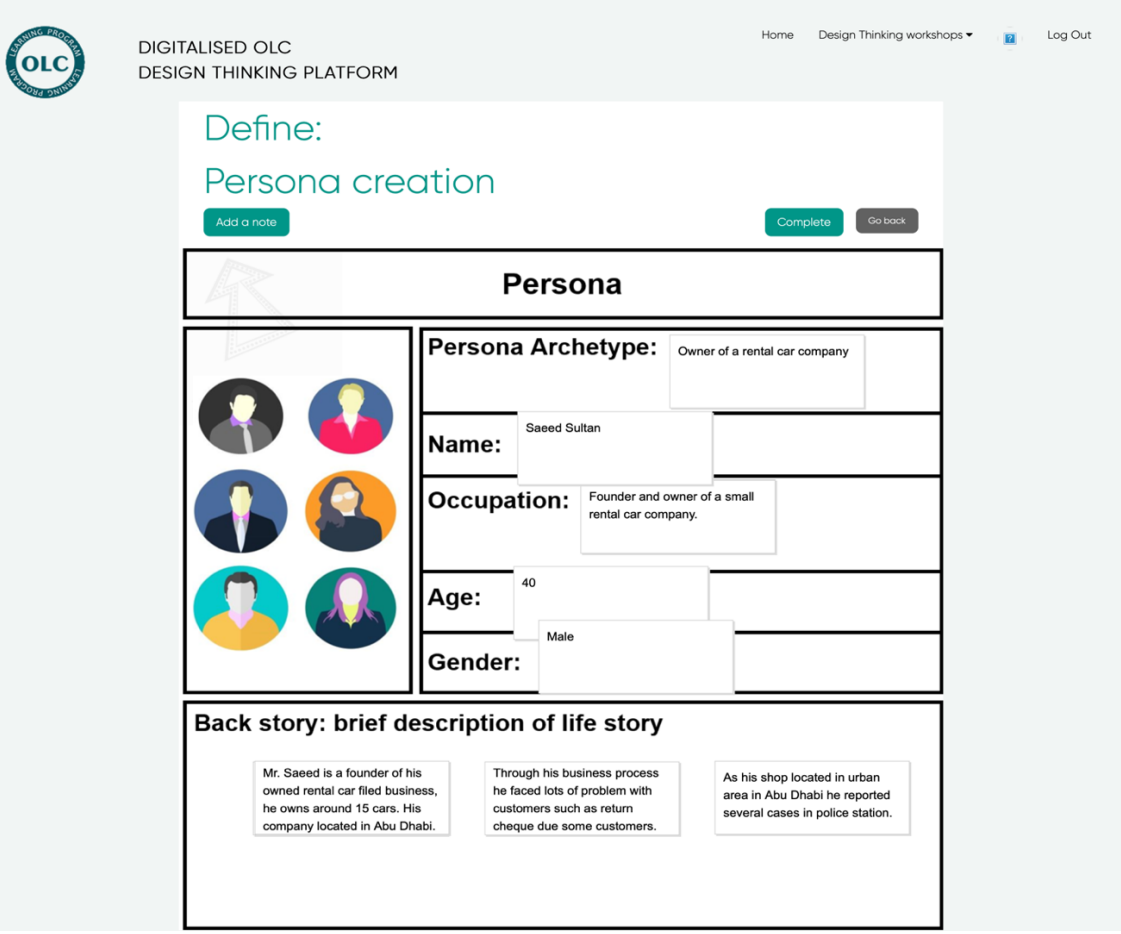

Figure 8. 13: Design thinking case study: The output of the Define activity.

The next activity was Ideate. The participants started to generate ideas about the solution and divided the ideas into three aspects 1) IT and Security, 2) Services, and 3) Legal Regulation. Figure 8.14 shows the output of this activity.

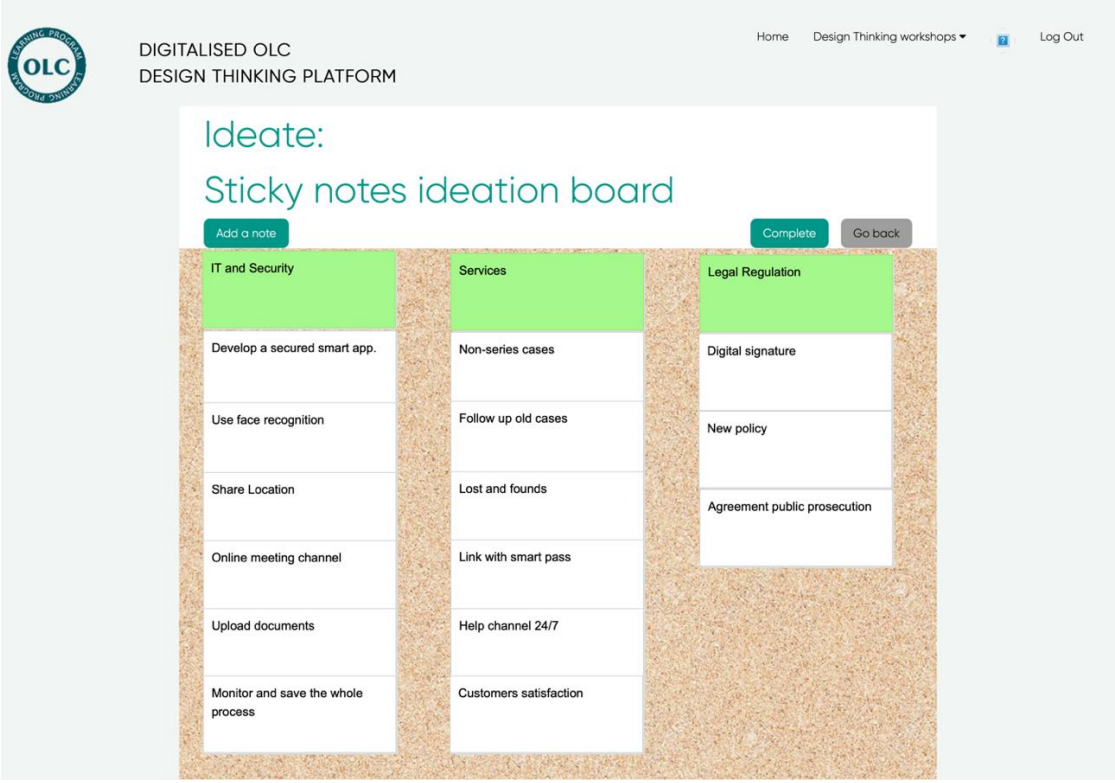

Figure 8. 14: Design thinking case study: The output of the Ideate activity.

The participants then started the fourth activity which is the Prototype. The group used MS PowerPoint to present their prototype as there was not enough time. The prototype described the new solution process. The new solution consisted of three stages: registration, case creation, and quality and compliance. The new solution proposed that the person who wants to report a case will download the police station application and log in through his/her personal ID or face recognition which will be verified through the government's database. Once the registration is completed, a live communication between the person and the investigator will start with continuous face recognition. The person will be able to upload files or pictures and share locations. The person can retrieve and follow up cases. The group suggested that once the application is implemented, the organization should share the outcome reports from the new solution with the legal authorities to take the final approval to launch the service. Figure 8.15 shows the prototype of the new solution of the smart police station.

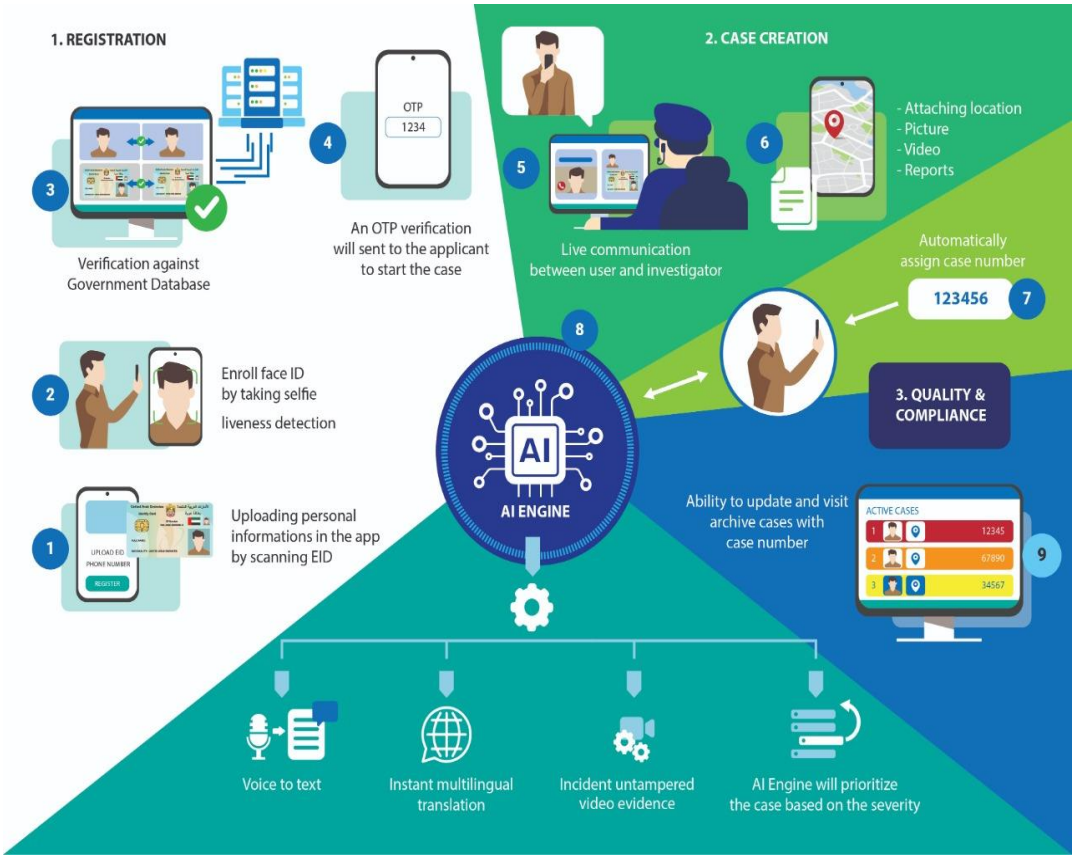

Figure 8. 15: Design Thinking case study: The prototype of the new solution of smart police station.

As shown in Figure 8.15, the new solution consists of three stages which are registration, case creation and quality and compliance. Each stage has several steps. Table 8.3 presents the three stages and their steps in details.

Table 8. 3: The process of the new solution.

No.	Stages	Step Description	Details
1	**Registration**	Uploading Personal Information	User scans Identification card via a mobile application that extracts information from OCR-MRZ, chip, and information page
2		Face Capture	User will perform a liveness check and enrol his/her photo to finalize facial onboarding, using mobile application SDK
3		Government Database Verification	All captured data will be verified against authenticated government databases
4		OTP Verification	Once the user is verified, an OTP will be sent to the applicant to enable user access
5	**Case Creation**	Live communication	Live communication between the user and the investigator with continuous face recognition
6		Attachment	User will be able to attach location, pictures, videos, or any other supporting material
7		Case assignment	The system will automatically generate a case number and assign it to the user
8		AI Engine	AI Engine will perform using the following: • Instant Multi-language translation • Store untampered video and evidence • Automatic Voice to text technology • Classification of calls based on severity to prioritize response
9	**Quality and Compliance**	Follow up and instant communication	The ability to retrieve cases, follow up and updates on each case A dashboard that provides statistics and the ability to search achieved calls for quality assessment

The last activity was the Test. In this activity, the group was supposed to present their prototype to the other groups and get their feedback. As there was only one group in this case study, the group presented their prototype to two station commanders through the Zoom meeting application to get feedback. The feedback was documented in the test activity page in the software demonstrator as shown in Figure 8.16.

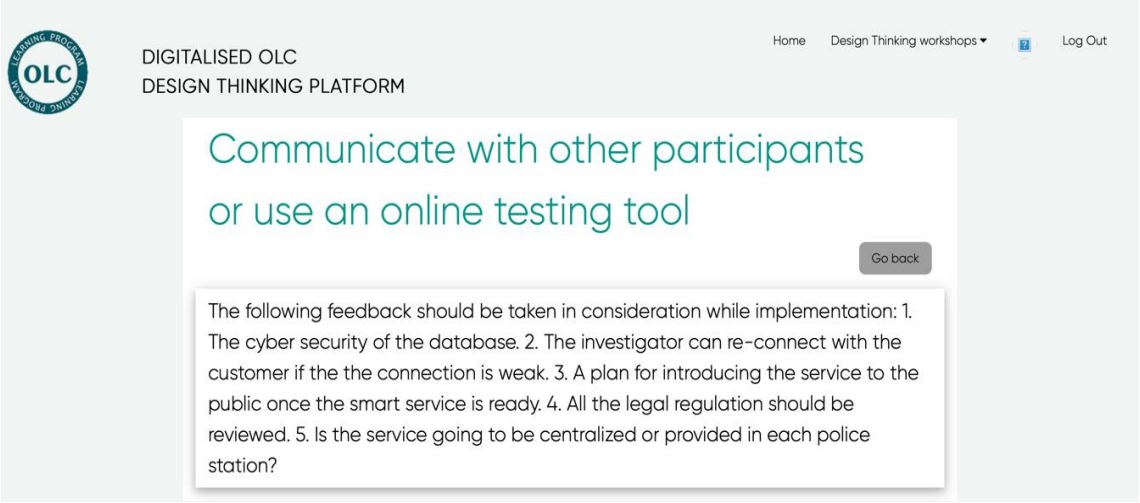

Figure 8. 16: Design thinking case study: The output of the test activity.

After the participants finished all the activities of the workshop, the group presented their prototype to the Judges through the Zoom meeting application. The Judges logged into their pages in the software and accessed the on-going design thinking workshop as shown in Figure 8.17. In this case study, the two assigned judges were having one access to the software demonstrator as they were doing their tasks together at the same place. The judges evaluated the prototype as presented in Figure 8.18.

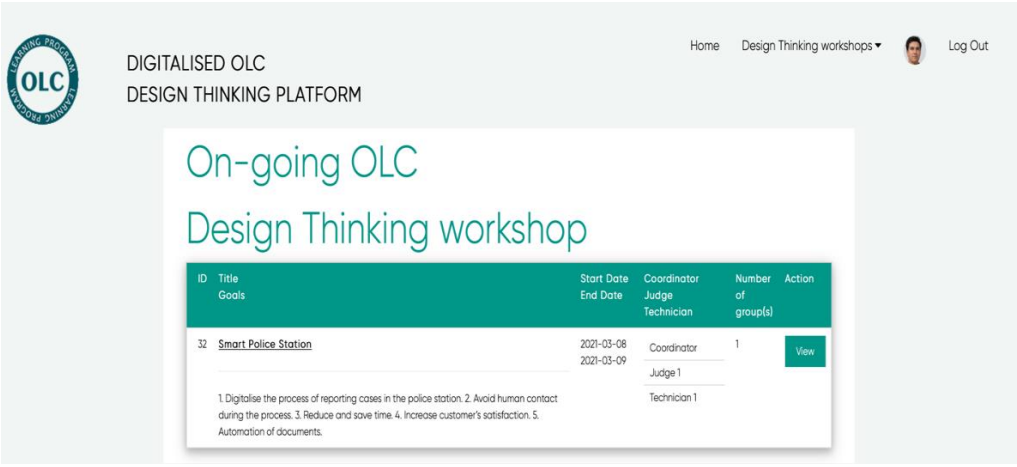

Figure 8. 17: Design thinking case study: Judge's on-going design thinking workshop page.

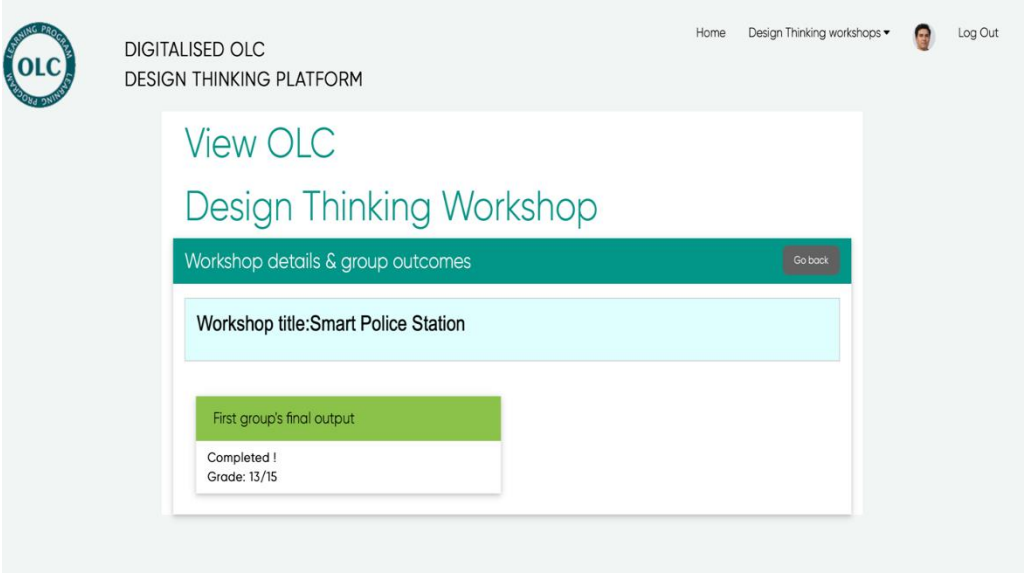

Figure 8. 18: Design thinking case study: The evaluation of the group outcome by the Judges.

The output of the design thinking workshop was sent to the project management office in the organization who will follow up on the improvement of the prototype by the group members within three months. The group will work on improving the prototype based on the provided resources. After this period, the Judges will review the outcome and give the approval to start the process of implementing the solution in the organization.

8.3 Experts Judgment Evaluation

In order to validate the OLC model and sub-models, two experts from the field of public service organizations were contacted to perform the expert judgment evaluation. The OLC models, sub-models and the two case studies have been presented to each expert. The experts were given set of questions to reflect their opinion on the models and the ability to build these models in public service organizations. The experts were chosen based on their years of experience and the positions they occupied in public service organization. Table 8.4 presents the experts and their years of experience.

Table 8. 4: **Experts who participated in the expert judgment evaluation.**

	Position	Academic Degree	Company/ Organization	Years of Experience
1	• Director of People for the largest single employer in the South East of England. • HR senior advisor in UAE and Kazakhstan Government.	MBE for services to policing and Human Resources	• U.K. government • Abu Dhabi police • Kazakhstan government	30 years
2	General Director of Competences' Development	PhD in Occupational Psychology	• Ministry of Interior - UAE	25 years

The questions asked to the experts were divided into two sections. The first section was about the OLC model, sub-models and the digitalisations of the models presented in chapter 5 and 6. The second section was about the results of the two case studies validations presented in Section 8.2. Table 8.5 presents the questions asked to the experts and their feedback.

Table 8. 5: Expert judgment evaluation

		Expert Judgment Evaluation	
		Expert 1	**Expert 2**
Overall approach	Q1: Has the OLC model been presented graphically in a manner that is easy to understand and follow?	Yes, the model has been presented in a clear, concise and logical manner. It is easy to understand and identify the key steps in the process. In my opinion, it is not open to ambiguity or misinterpretation.	The OLC model has been presented graphically in a manner that is easy to understand, gain insight and follow. It was easy to understand the relationships between the different elements of the OLC model. The tasks in each stage make it easy for organizations to implement the OLC model. I think the model is ready to be used by public service organizations.
	Q2: Have the enabling digitalised solutions been well represented in the OLC model?	The enabling digitalised solutions for the OLC Model are clearly aligned to the purpose of the model and enable a SMART solution to the integration of the model in the government sector.	The enabling digitalised solutions have been successfully represented and illustrated by several examples in the OLC model. Digitalising the learning process will help organizations by providing a flexible and appropriate learning environment. In my opinion, it is very important to integrate the digitalised solution proposed in this model with the organizations' internal systems and platforms. This will support the model by providing more data about the organizations and the employees which will lead to effective knowledge gap identifications. Also, it will make it easier to transfer the knowledge within the organization.

	Q3: Has the coaching learning program been well presented with it associated digitalised solution in a manner that is easy to follow?	The coaching learning program and associated digitalised platform have been presented in a very logical manner and what has been presented will have numerous business benefits for public sector organization. It will allow the roll out of the coaching program in a controlled manner and enable the senior leadership teams to draw of metrics to measure individual and business benefits. Once again, the use of SMART technology supports the Government's transformation agenda. In my opinion, organizations should be able to allocate Coaches from inside or outside the organization, as this will provide more range of topics to be covered by coaching and it leads to more effective coaching.	The coaching learning program and the digitalised solution have been well defined and presented. The coaching program tasks are clear and easy to follow. Identifying the tasks of the coaching and linking the results to the performance are the key benefits of the proposed model. Using the digitalised solution will help organizations to provide coaching for their employees easily and they can monitor the coaching activities. In my opinion, organizations should take into consideration training and certifying coaches in their organization while implementing the coaching learning program.
	Q4: Has the Gemba-Walk learning program been well presented with the associated digitalised solution in a manner that is easy to follow?	The Gemba-Walk learning program and the associated digitalised platform have been well presented in a clear and concise manner. The ease of use will encourage more innovation and excellence in a progressive organization. It will also allow the senior leader to be closer to their businesses and draw of metrics on learning programs and outcomes.	The Gemba-Walk learning program and the associated digitalised solution have been clearly presented. Implementing such a learning program will enhance the service provision as well as the employee's capabilities. The conversations between leaders and employees during the walk will encourage innovation and creativity in the organization. Also, it makes the leaders closer to their business and services.
	Q5: Has the design thinking learning program been well presented with the associated digitalised solution in a manner that is easy to follow?	The design thinking program has been presented very well. It is clear and concise and is not open to misinterpretation. It will be easy for the end user to follow. The digitalised solution enables a wider reach. It will be a responsive and accessible tool for the business. The use of a digitalised solution will allow senior leaders to access business metrics.	The design thinking learning program has been presented very well. The model facilitates implementing the learning program easily within organizations. Applying the design thinking will encourage innovations in the organizations. Using the digitalised solution will allow to get more minds to participate in the learning program which will generate more innovative ideas.
Case studies results	Q1: Has the digitalised software demonstrator for the coaching learning program been developed in a manner to present the model and demonstrate the application of the digitalised solutions for its different tasks?	The demonstration illustrated very clearly the business benefits of the coaching learning model and how digitalisation will enable a greater reach, increase speed and reduce abstraction costs associated with traditional coaching models. The demonstrator facilitates the implementation of all the tasks in the coaching model. The demonstration also alluded to how this would	The coaching digitalised software demonstrator represents all the tasks of the coaching model. The demonstrator helps the Coach and Coachee to perform the coaching activities easily and remotely. Also, it allows the organizations to monitor all the coaching activity. The demonstrator will help organizations to perform the coaching learning program and get the maximum benefit out of it.

		improve productivity as well as a number of other business benefits.	
	Q2: Have the results of the digitalised coaching software demonstrated the expected output of the learning program in a public service organization?	The demonstration clearly showed the expected outputs and the business benefits of introducing such a model in a public sector organization. It was very clear that the payback period and added value would be seen very quickly. The individual and organization benefit, particularly in terms of how coaching can improve individual performance and ultimately business performance. In my opinion, organizations should set a list of competencies that could be enhanced through the coaching learning program.	The output of the coaching learning program case study using the digitalised software demonstrator was good and as expected. The software demonstrator assists the Coach and the Coachee to do all the required activities in the learning program. All the activities were monitored and recorded. In my opinion coaching can be more useful when it is applied to behaviour competencies such as self-development skills, flexibility and adaptability skills and time and priority management.
	Q3: Has the digitalised software demonstrator for the Design thinking learning program been developed in a manner to present the model and demonstrator the application of the digitalised solutions for its different tasks?	The digitalised software demonstrator for the Design Thinking learning program was very clear and supports Government's desire to encourage innovation and excellence in the workplace. The demonstrator has clearly facilitated the design thinking process to be conducted by the participants.	The developed digitalised software demonstrator for the design thinking learning program facilitate the delivery stage of the design thinking model. It provides all the tools to apply the design thinking process in comprehensive way. Also, it helps participants in the same group to collaborate ideas and lead them to the required solutions in a very easy and smooth way.
	Q4: Have the results of the coaching digitalised Design Thinking software demonstrated the expected output of the learning program in a public service organization?	The digitalised software solution for the DT solution was very well presented. It was clear and illustrated the business benefits. It supported the UAE Government's ambition of using technology enabled solutions. The use of the demonstrator would allow greater accessibility and reach. It would also allow the senior leaders to get the best innovative solutions for their service provision.	The output of the design thinking case study using the digitalised software demonstrator was promising and innovative. The demonstrator helps the participants to come up with innovative solutions. Also, it helps to bring participants from different sectors together and share their ideas which leads to comprehensive and doable solutions. The demonstrator helped the organization to defend all the possible solutions for the services from different points of view.

Chapter 9: Discussion of the Results and Conclusions

9.1 Introduction

This chapter presents a discussion on the key themes considered throughout this thesis. Also, the main contributions to the knowledge, conclusions and future work are presented in this chapter.

9.2 Discussion of the results

Organizational learning capability helps public service organizations to bridge the gap between learning within organizations and the quality of the service provision. Based on the performed literature review presented in Chapter 3, the author found that the topic has been discussed in several studies. Although there are several scholars who have provided different definitions for the OLC, none of them were comprehensive nor clear enough to be followed by public organizations (Alkaraeen and Al-Ashaab 2021). Therefore, the author in this thesis has proposed a definition for the OLC: "The facilitation of a process to ensure that the organization is learning from its operations and experiences of different projects and initiatives. This learning process is influenced by certain factors that are directly related to the performance of both employees and service provision". Furthermore, several OLC frameworks were proposed by different authors, but none of them have suggested how to implement OLC within organizations. Also, all the frameworks were abstract to the point that none of them provided a comprehensive list of factors affecting OLC implementation, nor did any highlight the use of digital technologies in the OLC – detailed analysis of these acclaimed OLC frameworks are presented in Section 3.3.4 and Table 3.3. Based on the analysis of literature review, the author has captured the main elements of the OLC; these include the learning process, the enablers and the influential factors as detailed in Section 2.2.3 and Chapter 5.

A four-phase research methodology has been adapted for this thesis, where each phase consists of several tasks. These phases are 1) theoretical framework, 2) field study, 3) model development as well as 4) validation and evaluation. The four phases of the research methodology helped the author to address the defined objectives step by step as each phase's output was an input for the next phase. The post-positivist paradigm has been adapted as a research paradigm, as it is one of the main philosophies for understanding operations management and learning. Also, it

helped the author to conduct qualitative research and deduct the reality about OLC in public service organizations.

In order to perform the field study, a questionnaire about OLC has been developed. The questionnaire was developed based on the outcome of the literature review. As the questionnaire was developed, the author contacted 40 organizations through emails and phone calls to request their participation in the field study. The response rate was acceptable, as 75% of the contacted organizations gave approval to take part in the study. Thereafter, a semi-structured interview was conducted with 37 employees from 30 public service organizations to capture the sector's perspective of OLC. The semi-structured interviews were conducted face to face and via meeting applications. The semi-structured interviews helped the author to narrow the conversations with interviewees to address the data needed in the questionnaire. Also, the in-person interviews helped the author to fully explain each element of the questionnaire in order to make sure the results reflect the perspectives. Moreover, conducting the field study in 30 organizations in United Arab Emirates, United Kingdom, France, Poland, Spain, Norway, and Finland helps the author to have a wide range of views from different parts of the world. As the Likert scale (Likert, 1932) from 1 to 5 was used to answer the questions of the importance and the effectiveness of different elements of OLC, it was noticed that the interviewees were avoiding choosing 5 as the most important or effective because it was either not measured clearly in their organizations or it has not been implemented in their organization, despite their belief that it is important or effective. The main take out of the field study is organizations have shown a good appreciation of the OLC approach and the need for its formal applications to enhance the employees' skills and the service offering. The participated organizations highlighted the importance and the need for a clear and easy to follow OLC model that could be supported via digital enabling technologies (Caputo et al., 2019). The field study helps to capture the good practices of the key activities that are in use in learning process in different organizations – see Figure 4.2. The field study was a good opportunity to capture the common practices of the different learning programs currently in use in public organization - see Figure 4.3. In addition, the participating organizations showed interest in introducing new effective learning programs. Furthermore, the field study helped the author to get a practical point of view of the main enablers and influential factors that affect the learning process of the OLC model. These enablers and influential factors were explained and addressed in the proposed OLC model – refer to Section 5.2 Figure 5.1.

The developed OLC model is a graphical representation of the OLC definition proposed in this thesis. Based on the findings of the literature review and the analysis of the field study, the OLC model was developed which consists of three main elements, namely; the learning process (Moghadam, 2013), enablers (DiBella, Nevis and Gould, 1996) and influential factors (Alegre and Chiva, 2008; Moghadam, 2013). This a novel approach of designing a comprehensive OLC model in a graphical and detailed manner that helps to introduce and implement it in public service organization. The learning process contains six stages: 1. Knowledge gap identifications, 2. Learning program selection, 3. Plan and design, 4. Learning program delivery, 5. Impact evaluations, 6. Knowledge transfer. Each stage has several tasks to help public service organizations to implement OLC using digital enabling technologies (Vial 2019). To support the implementation of the learning process, the author has provided some enabling digital technologies that support the implementation of several tasks of the learning process. Moreover, the learning process contains a stage to evaluate the impact of the learning process in performance within the organizations, which has not been discussed in previous OLC frameworks. The enablers are the factors needed by the organizations to implement any learning within the organizations. The influential factors are the factors that affect different tasks of the learning process. The organizations should take those influential factors into consideration while implementing any learning process to maximize the benefits of any learning programs. The developed OLC model shown in Figure 5.1 is comprehensive enough to be able to implement a wide range of learning programs; training, coaching, mentoring, apprenticeship, internship, visiting fellow, design thinking, Gemba-walk, formal degrees. This gives the organizations the opportunity to implement new learning programs using digital enabling technologies with features of process innovations, service innovation, problem solving, knowledge retention, sharing knowledge and good practices. Therefore, the author developed three OLC sub-models to cover different learning programs, namely coaching (Kwan, 2015), Gemba-Walk (Flores et al, 2021) and design thinking (Flores and Golob, 2020). This is to demonstrate the implementation of learning programs with the mentioned features.

In order to validate the coaching learning program process and the design thinking learning process, two digitalised software demonstrators have been developed. Open-source technologies have been used in developing the two software demonstrators as it makes it easy to enhance and extend the software demonstrators. The coaching software demonstrator digitalised all the tasks of

the coaching learning process, while the design thinking software demonstrator digitalised certain tasks in the design, delivery and evaluation stages of the design thinking learning process (refer to Figure 6.5, Section 6.4.3). The simplicity of tools used to develop the software demonstrators, allow the author to upload the software demonstrators to a cloud server where organizations can use it through the intranet. The digital software has demonstrated aptitude in the following: -

1. Introduced the learning process by which the coaching and design thinking learning programs processes are innovative.
2. Facilitating problem solving among coach and coachees in the coaching learning program and all the participants in the design thinking learning program.
3. Facilitating knowledge retention and sharing via recording and digitally capturing the results of the key activities of the learning programs.

To validate the proposed OLC model and OLC sub-models, the author has used two step verifications. Firstly, two case study validations in a public service organization in UAE which are the coaching learning program and design thinking learning program. The following have been demonstrated: -

1. Introduced formally using the coaching digital software demonstrator to improve the competence of project management application on human resources and IT services.
2. Introduced formally using the design thinking digital software demonstrators to develop innovative services within a smart police station where public can report cases without visiting the police station – see Figure 8.15.
3. Facilitating project management problem solving among coaches and coachees.
4. Facilitating a virtual environment for the participants in the design thinking learning program to solve problems and design a new concept of a smart police station.
5. Facilitating knowledge retention and sharing via recording and digitally capturing all activities of the coaching of human resources and IT project management using standard templates and saving them in a common platform using cloud service.
6. Facilitating knowledge retention and sharing via recording and digitally capturing the results by providing a sharing board, recording each participant's activities and saving the whole design thinking process through the cloud service.

The second validation step was done through expert judgment evaluation. Two experts in learning in public service organizations participated in the expert's judgment evaluation. The

proposed OLC model and sub-models were presented to the participating experts as well as the results of the two case studies. The feedback of the experts was mostly positive, and they provide some opportunities to improve which will be addressed for future work.

9.3 Contribution to the knowledge

The main contributions to knowledge in this thesis are as the following:

1. A clear definition of Organizational Learning Capability (OLC).
2. A comprehensive list of enablers and influential factors that affect the learning process in public service organizations.
3. A comprehensive OLC model which contains the main elements of OLC which help public service organizations to implement OLC. Also, the model allows the organizations to implement any new learning program and maximize the benefits from it and measure the impact of the learning program in the performance of the organization.
4. Introducing the use of enabling technologies in OLC within the public service organizations by digitalising the learning process.

9.4 Conclusions

A number of conclusions from this research are drawn which are as follows:

1. Public service organizations spent a certain budget yearly to enhance their employees' skills and performance. Most organizations use traditional training methods for this purpose. Although these traditional methods can enhance the employees' skills, they are costly, and inefficient as the employees need to leave their work to do the required training and the impact in performance cannot accurately be measured. Therefore, public service organizations can use organizational learning capability aspects that allow the organization to learn from their operations, experiences and their projects and initiatives, as well as to introduce new learning programs.
2. The results of the data analysed show that public organizations are performing some learning practices, but they need a comprehensive model that allow the organizations to apply new learning programs and get the maximum benefits from them.

3. The developed OLC model has been a good representation of the new OLC definition proposed on the thesis. Therefore, the proposed OLC model consists of three main elements which are learning process, enablers and influential factors.
4. The research demonstrated that the top OLC model could manage a wide range of different learning programs. Therefore, three learning programs, namely coaching, Gemba-Walk and design thinking learning programs, have been developed as an example of implementing new and innovative learning programs within public service organizations where more new learning programs can be introduced within the OLC model.
5. The effectiveness of implementing OLC model and sub-models is enhanced significantly through employment of digital enabling technologies.
6. The use of open-source technologies to develop the digitalised software demonstrators has been a good approach to have smooth and easy software development. At the same time, it has been possible to demonstrate the application and the implementation of different tasks of the OLC models.
7. The two step validations that have been used to validate the OLC model and sub-models, showed an interest on the findings of this thesis by public service organizations. The two case study validations showed that the organizations support the implementation of new learning programs within the organization. Furthermore, digitalising the learning process can facilitate the implementation process and deliver the learning program in an efficient and effective way. Also, the two experts who participated in the expert judgment evaluations showed interest in applying the aspect of OLC in public service organizations and they believe that the proposed OLC model will enhance the learning activities within the organization. Moreover, they support the idea of digitalisation, as it helps the organizations to be transferred into smart organizations.

9.5 Future work

Based on the findings of this thesis, there is an opportunity for further research. As the OLC enablers have been identified as main elements of the OLC model, a study about how to implement the OLC enablers within public service organizations will support the implementation of the OLC model. Also, a study about implementing further new and innovative learning program processes within the OLC model in public service organizations can introduce more learning programs which

help public service organizations to enhance the employee's skills and services provision. Although the developed OLC model proposed a stage within the learning process to evaluate the impact of the learning process, a study about improving the impact evaluation of learning activities within public services organizations using digital enabling technologies would enhance the application of OLC within the originations. Moreover, integrating the current software systems used by organizations such as the human resources systems, the project management system, the key performance indicators systems and other operational systems with the OLC model tasks will lead to more accurate knowledge gap identification and more effective knowledge transfer within the organizations.

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APPENDICES

APPENDEX A

QUESTIONNAIRE

Digitalised Solutions of Organisational Learning Capability to Enhance Performances of Public Services Organisations

PhD Research

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Introduction

The aim of this questionnaire is to investigate and gain better understanding about the learning methods provided by public organisations to their employees. It will be helpful to learn and measure the impact of both individual learning and organisational learning on the overall performance of the organisation. These insights will help the research to develop an organisational learning capabilities model that encourages learning activities in public service organisations utilising digital technology. This is to enhance the employee's skills and services offering of the public organizations.

The questionnaire is divided into 4 parts: -
1. Information about training department.
2. Learning process.
3. Influential factors.
4. Digitalisation.

Detail of Participant

Name:
E-Mail:
Phone Number:
Company:
Business Sector:
Country:
Position:
Years of Experience:

1. Information about training department

1.1 Do you have a formal department that cares about training of your employees? (Select one)

OPTIONS	SELECT
Case 1 – Yes, we do have a formal central training department which is part of the human resources	
Case 2 – We have a team which takes care of the training of the employees of the organisation	
Case 3 – No, we do not have a central training department. Each business unit takes care of its own training	
Case 4 – No, we do not have neither a training department nor a training programme in the organisation	

- If it's formal, what it is called?.....

1.2 Which of the following terminologies are in use within your organisation? (Please select as appropriate)

OPTIONS	FREQUENCY					YOUR OWN DEFINITION
	Very Low	*Low*	*Medium*	*High*	*Very High*	
1. Organisational Learning Study the learning process of an organisation, from an academic point of view						
2. Learning Organisation An entity, ideal type of organisation, which has the capacity to learn effectively and therefore to prosper						
3. Organisational Knowledge Understand and conceptualise the nature of knowledge that is contained within organisations. How and what knowledge is shared and stored						
4. Knowledge Management Creating ways of measuring, disseminating, storing and leveraging knowledge in order to enhance organisational performance						

1.3 Do you have a budget dedicated to the training of your employees? (Please put an estimated figure)

1.4 Do you classify the training programme according to the following?

OPTIONS	IMPORTANCE					EFFECTIVENESS				
	Very Low	*Low*	*Medium*	*High*	*Very High*	*Very Poor*	*Poor*	*Good*	*Very Good*	*Excellent*
1. Basic training										
2. Management										
3. Leadership										
4. Specialised training										
5. Others (please specify):										

1.5 Which of the following task do you perform at your training department?

OPTIONS	IMPORTANCE					EFFECTIVENESS				
	Very Low	*Low*	*Medium*	*High*	*Very High*	*Very Poor*	*Poor*	*Good*	*Very Good*	*Excellent*
1. Planning (Promotion, budgeting, logistic…)										
2. Designing										
3. Delivery (Internal, external, specialised speakers…)										
4. Follow up										
5. Evaluation of the training course										
6. Evaluation of the impact of the knowledge gained by the individual on the organisation										
7. Others										

1.6 How do you evaluate the impact of the training on the performance of the individual and the organisation in large? (i.e., how the gained knowledge from the training will enhance the performance of the individual and the organisation as well as the service offering and how you do measure this impact?)

OPTIONS	IMPORTANCE					EFFECTIVENESS				
	Very Low	*Low*	*Medium*	*High*	*Very High*	*Very poor*	*Poor*	*Good*	*Very good*	*Excellent*
1. Questionnaire to be sent to the participants after a period (1–6 months) to evaluate the impact of the knowledge of the course at work										
2. KPIs										
3. By giving a specific task to the participants to apply some of the knowledge in their working environment										
4. Apply the gain knowledge on real case in the organisation										
5. The individual participant reports back to the training department										
6. Kirkpatrick: The use of learning and training evaluation theory after delivering the training course										
7. Interviews of specific group of participants of the training course										
8. Others (please specify):										

2. Learning process

2.1 Which of the following learning programs is in practice in your organisation? (Select as appropriate)

OPTIONS	FREQUENCY					EFFECTIVENESS				
	Very Low	*Low*	*Medium*	*High*	*Very High*	*Very poor*	*Poor*	*Good*	*Very good*	*Excellent*
1. Training										
2. Apprenticeship										
3. Internship										
4. Graduate Programme										
5. Pilot project initiative										
6. Mentoring										
7. Coaching (Special 1 to 1 class given to one person or a small group within a specific time frame with an aim in mind)										
8. Formal degree sponsorship (Sponsor an employee to study for a degree in a university)										
9. Visiting Fellow (A scholar from an institution who visits a host university and is projected to teach, lecture, or perform research on a topic the visitor is valued for.)										
10. Design a customised degree with a university										
11. Others (please specify):										

2.2 Which of the following approaches helps your organisation to learn from its operations? (Select as appropriate)

OPTIONS	SELECT
1 – Well documented operations [Process mapping, Flowchart, ISO9001 (2015)]	
2 – Employee's feedback to the process owners (provide examples)	
3 – Monitoring operation by line managers	
4 – Others (please specify):	

- Give an example of recent efforts to learn from the operation of the organisation.

2.3 How does your organisation learn from its experiences and initiatives? (Select as appropriate)

OPTIONS	FREQUENCY					EFFECTIVENESS				
	Very Rare	*Rare*	*Regularly*	*Often*	*Very Often*	*Very Poor*	*Poor*	*Good*	*Very Good*	*Excellent*
1. Direct feedback from employees to the organisation via line manager, HR or owner of the process										
2. By solving problems in the operations										
3. Lesson learnt log										
4. Monitoring the progress of the improvement of the KPI										
5. Others (please specify):										
6. Others (please specify):										

3. Factors

3.1 Which of the following are important enablers in your learning processes? (Please select as appropriate)

ENABLERS	IMPORTANCE				
	Very Low	*Low*	*Medium*	*High*	*Very High*
1. Supportive Leadership Having support from the team leaders. The powerful members of the department take care of the well-development of the training activities.					
2. Altruism People in the department act out of concern for another's well-being. The whole department is fully-involved in making sure that all the employees are being well-trained.					
3. Visualisation Using all kind of pictures, tables, maps and diagrams for the knowledge transmission.					
4. Learning in communities Transforming the training methodology in a workshop where everyone participates and gets involved. This will enhance dialogue and critical thinking. In that way, learning becomes easier.					
5. New Technologies The use of new technologies in the employees' formation such as e-learning, specific training software, WebEx…					
6. Relationship with Universities					
7. Others (Please specify):					

3.2 Which of the following factor has got an influence on the learning processes? (Please select as appropriate)

FACTORS	IMPORTANCE				
	Very Low	*Low*	*Medium*	*High*	*Very High*
1. Teamwork cooperation and group problem solving Work is carried out in groups where it is possible to share knowledge and learn about other employees needs and ways of working. Organisation encourage teamwork and group problem solving.					
2. Knowledge share Share of knowledge and its storage for future use. It also involves observing the inside of the organisation and other companies to increase knowledge of the organisation.					
3. Experimentation Encouraging employees to share their new ideas and solutions. The organisational openness to change and new approaches to problems arising in the company.					
4. Risk taking Toleration of some errors as a possibility of a different approach to the situation which might cause positive aspects for diversity in organisation.					
5. Interaction with the external environment Good relation and sharing the internal knowledge of organisation to the external environment (supplier, competitors, customers, stakeholders, governmental system and economic)					
6. Dialogue Communication between individual employees and managers. It has to be clear and fast.					
7. Participative decision-making Decisions are made with involvement of employees. Employees participative decision making are satisfied, motivated and their commitment is higher.					
8. Systems thinking The identity of the organisation. Every employee understands the aim of the organisational and knows that it is a system made up of different departments/teams which have to coordinate with each other.					
9. Leader commitment Leaders act regarding the goals of the organization. They are committed to the aim of organisational learning and trying to identify performance gaps which have to be improved.					
10. Others (Please specify):					

3.3 What is the top barrier to learning in your organisation? (Please select as appropriate)

OPTIONS	EFFESCTIVENESS				
	Very Low	*Low*	*Medium*	*High*	*Very High*
1. Absence of Leadership support					
2. Lack of willingness to share individual knowledge					
3. Low cooperation across departments					
4. High cost (software + training + computer equipment)					
5. Absence of a learning culture within the organisation					
6. Bureaucracy					
7. Others (please specify):					

4. Digitalisation

4.1 Which of the following digital technologies do you currently use?

OPTIONS	IMPORTANCE				
	Very Low	*Low*	*Medium*	*High*	*Very High*
1. Virtual learning environment					
2. Virtual Reality					
3. Video					
4. Augmented Reality					
5. Artificial Intelligence					
6. Simulation					
7. Mobile Apps					
8. Facial recognition					
9. Learning analytics					
10. Business games					
11. Others: (Please specify)					

4.2 Which of the following advantages do you see in delivering a course using digital mode?

OPTIONS	IMPORTANCE				
	Very low	*Low*	*Medium*	*High*	*Very high*
1. Cost reduction					
2. Increased productivity and engagement					
3. Personalised learning					
4. Easier scheduling and time-saving					
5. Collaborative learning (help forums, etc.)					
6. Continuous feedback and assessment					
7. Opportunity to learn at one's pace					
8. Opportunity to learn from any location					
9. Others (please specify):					

4.3 What is your organisation's approach to using digital learning methods for employees?

☐ Compulsory ☐ Optional ☐ Both

4.4 What would be your expectations in using mobile apps as a learning tool for your employees?

OPTIONS	IMPORTANCE					EFFECTIVENESS				
	Very Low	*Low*	*Medium*	*High*	*Very High*	*Very poor*	*Poor*	*Good*	*Very good*	*Excellent*
1. Personalised experience Have a feeling of a special and unique training process and not follow a classic pattern										
2. Powerful database Analyse the performance of each employee and learn what to improve on the training programme										
3. Offline mode Allow employee to train without an Internet connection										
4. Friendly user interface To motivate employee using this new way of training										
5. Live tutorials Giving the chance to have live interactions with the tutor and ask questions without depending on a questionnaire										
6. Mock test and Practical Implementation of tests in order to follow the training sessions of each employee										
7. Others (Please specify):										

4.5 How effective is the use of virtual learning environment on the learning experience of your employees?

OPTIONS	EFFECTIVENESS				
	Very poor	*Poor*	*Good*	*Very good*	*Excellent*
1. Increase in output of employees					
2. Use of learning analytics tool to gain insight					
3. Workers' willingness to learn (E.g. asking for more courses)					
4. Less employee's mistakes					
5. Others (please specify)					

4.6 Which of the following challenges do you face in implementing digital technology in your learning processes?

OPTIONS	CHALLENGES				
	Very low	*Low*	*Medium*	*High*	*Very high*
1. General computer skills of employees					
2. Costs					
3. Lack of experience					
4. Lack of digitalisation strategy					
5. Lack of appropriate equipment					
6. No government involvement and support					
7. Time-consuming process					
8. Resistance from older learners					
9. Privacy and cyber security					
10. Compatibility of technologies					
11. Other (please specify):					

APPENDEX B

User's guidance manual for coaching and design thinking digitalised software demonstrators

This document is explaining how to start using the coaching and design thinking software demonstrators. In order to use both digitalised software demonstrators, the two servers were deployed on the internet. Therefore, to start using the software demonstrators you should do the following:

1. open your web browser – Google Chrome or Safari for example – and access the following address: http://olcplatform.infinityfreeapp.com
2. Choose to access either the coaching or the design thinking learning programs shown in the below Figure.

Software demonstrator's homepage

- **Coaching digitalized software demonstrator**

Once the enroll coaching learning program is chosen, the coaching learning program homepage appears as shown in the below Figure.

Coaching software demonstrator's homepage

Several employees have been already created in the database. The following table is showing the username and password of each type of employees:

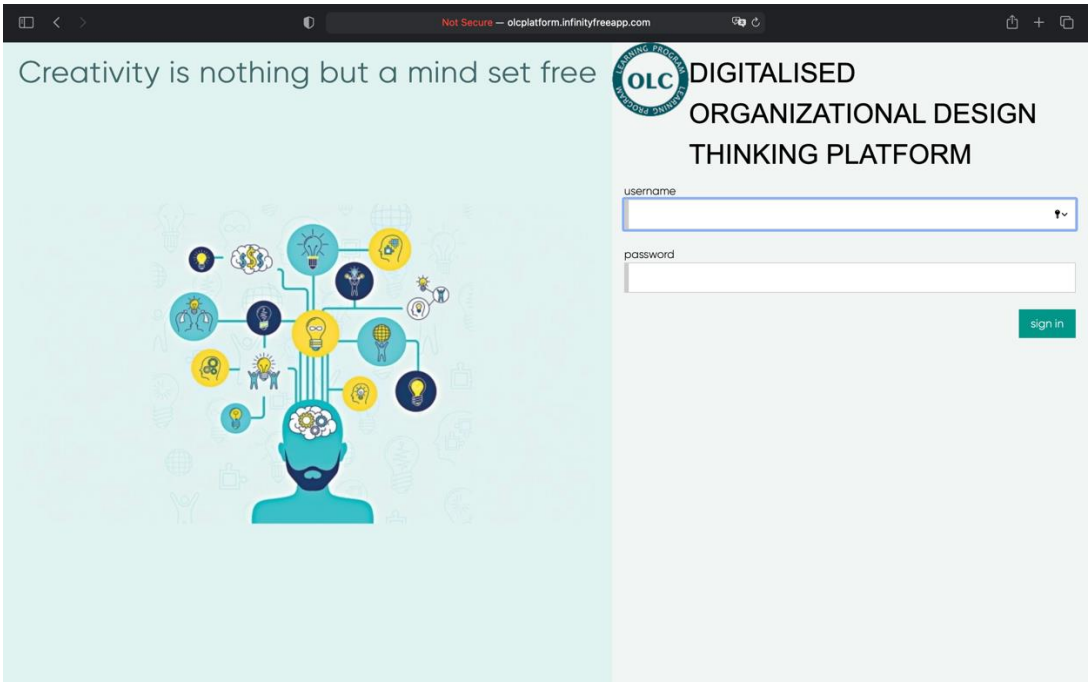
Type of user	Username	Password
ADMIN	admin	pass@1234
COACH	coach#1	pass@1234
COACH	coach#2	pass@1234
COACHEE	emp#1	pass@1234
COACHEE	emp#2	pass@1234
COACHEE	emp#3	pass@1234

If you need to create your own coaching learning, please contact the admin through m.k.alkaraeen@cranfield.ac.uk in order to create the coaching learning programs' users.

All the activities of each coaching user are presented in Chapter 6 Section 6.2.5.

- **Design thinking digitalised software demonstrator**

Once the design thinking is chosen from the demonstrator's homepage, the design thinking learning program homepage appears as shown in the below Figure.

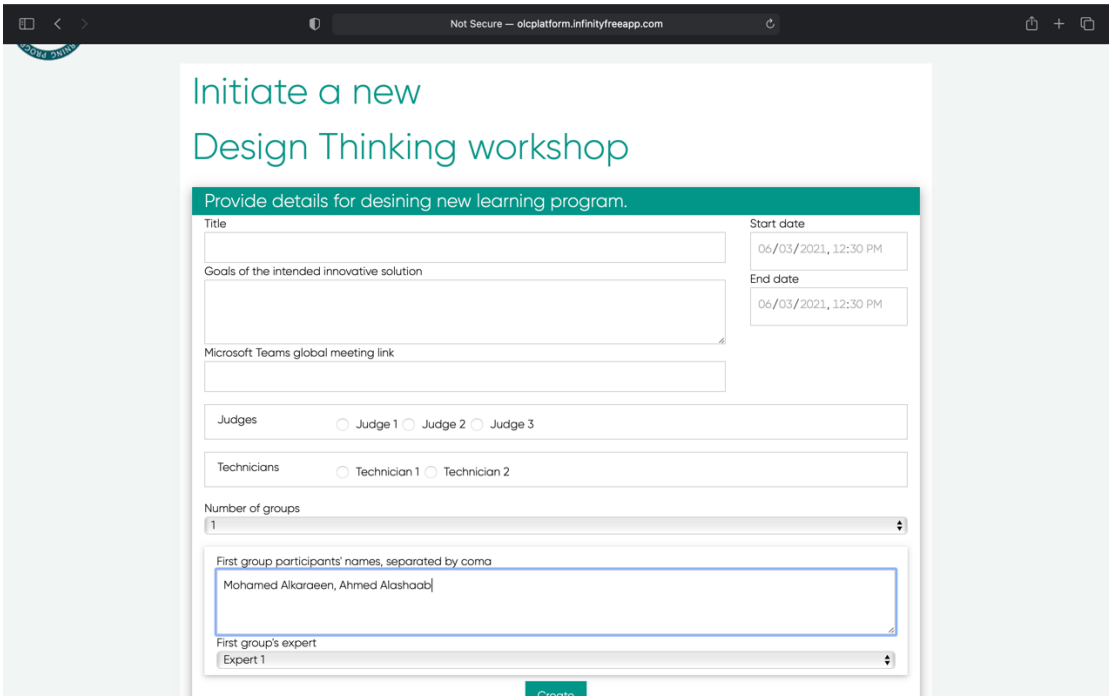


Design thinking software demonstrator's homepage

Several parties from the design thinking learning program have been already created in the database. The following table is showing the username and password of each party.

Type of user	Username	Password
COORDINATOR	admin	pass@1234
JUDGE	judge1	pass@1234
JUDGE	judge2	pass@1234
EXPERT	expert1	pass@1234
EXPERT	expert2	pass@1234
EXPERT	expert3	pass@1234
TECHNICIAN	technician1	pass@1234
TECHNICIAN	technician2	pass@1234

Once the coordinator starts the design thinking learning program through initiating a design thinking workshop page as shown in the below Figure, the coordinator will select each party in the in the design thinking workshop and initiate users for the invited participants. This will be done by entering the invited participants' first name and last name followed by a comma. For example, if the coordinator enters Mohamed Alkaraeen, Ahmed Alashaab, two users will be created in the data base where the first participants' username and password will be MohamedAlkaraeen and the second participants' username and password will be AhmedAlashaab.



The coordinator initiates a new design thinking workshop

If you need to create your own design thinking learning program, please contact the admin through m.k.alkaraeen@cranfield.ac.uk to create the design thinking learning programs' users.

All the activities of each party of the design thinking learning program are presented in Chapter 6 Section 6.2.6.