

Mobile Learning for Sales and Service Personnel: Case studies in the corporate training environment

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This thesis results entirely from my own work and has not been offered previously for any other degree or diploma.

The word-length of 49,873 conforms to the permitted maximum,

A handwritten signature in black ink, appearing to read 'Ravindra'.

Ravindra Kumar Prasad

Abstract

This research investigates how organisations where e-learning is already firmly established experience the adoption of mobile learning. Drawing on responses from training managers and sales and service staff, it investigates key aspects of mobile learning, as understood in organisations; how they perceive the relationship between mobile learning and e-learning provision; their key objectives for deploying mobile learning; and the dynamics of mobile learning practice as it is emerging.

The project uses a multi-case study methodology with data collected from three corporate organisations in different sectors (healthcare, computing, and financial services). In each case, data is drawn from interviews with training managers and questionnaire responses from sales and service staff.

Sharples' framework for mobile learning, which focuses on the mobility of learners and learning as 'conversations', forms the analytical basis for the study. Three case reports are first presented, and then a cross-case analysis is conducted to draw out points of commonality and difference between the cases.

My findings show that mobile learning is understood in the organisations through the lens of e-learning: while the two are not perceived as the same thing, the relationship is perceived to be close. While some barriers to adoption are technological, most concern social factors (stakeholder resistance and lack of leadership support). There is also a lack of use of

collaborative aspects of mobile learning in emerging practices, even though respondents were aware that such possibilities existed. Most importantly, actual practices of mobile learning are driven more by the organisations' business needs and how they have previously used e-learning, rather than their specific perceptions of mobile learning.

The work contributes to existing research on mobile learning in the corporate sector (especially the perceived advantages and effectiveness of mobile learning, and challenges in adopting it), and in particular, the influence of context (social factors) on integrating mobile learning in organisations.

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With a recklessness that is usually seen in much younger people, I decided to do my PhD when I turned 50. It was 2011. Throughout this arduous journey called “PhD”, I have experienced many moments of frustration and as many moments of exhilaration. But now, I am left with a deep sense of contentment and I am glad I took that decision. I learnt many valuable lessons and they were not just about Mobile Learning.

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List of Abbreviations

AECT	Association for Educational Communications and Technology
ATD	Association for Training Development
BYOD	Bring Your Own Device
ILT	Classroom/Instructor Led Training
CAGR	Compound Annual Growth Rate
CT	Gordon Pask's Conversation Theory
ICT	Information and Communication Technology
IT	Information Technology
IVR	Interactive Voice Respond
LCMS	Learning Content Management System
LMS	Learning Management System
LAN	Local Area Network
M-learning	Mobile Learning
PDFs	Portable Document Format
R&D	Research and Development
SMEs	Subject Matter Experts
TIPEC	Technology (T), Individual (I), Pedagogy (P) and Enabling Conditions (EC)
UNESCO	United Nations Educational, Scientific and Cultural Organization
WAN	Wide Area Network

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1 Introduction

1.1 A Brief Overview of the Project

Training in corporate organisations is currently accomplished through a variety of delivery methods – in the classroom, on-the-job, e-learning, to name a few (Craig, 1996). E-learning can be defined as learning that is electronically mediated (Parchoma, 2006). It refers to the use of computer network technology, primarily over or through the internet, to deliver information and instructions to individuals. This definition is true of eLearning both in the academic and corporate context. With the advent of mobile learning (learning through mobile devices), these organisations now have another way to train their staff (Traxler, 2007, pp. 6-8). Mobile learning (also known as m-learning) refers to gaining knowledge and skills using mobile technology without being constrained by location or time (Geddes, 2004). M-learning is the use of mobile technology to aid in the learning, reference or exploration of information useful to an individual at that moment or in a specific use context (Feser as cited in Mouyabi, 2012, p. 787). In the corporate context, mobile learning is also used to mean the transfer and delivery of knowledge by organisations to employees through mobile devices for learning and performance support.

The term 'mobile learning' has been in use since early 2000s and has continued to be a talking point of many conferences and training events to date. Several projects exploring mobile learning were piloted for research purposes and this continues to date (Keegan, 2005). The timeline of mobile

learning research and development indicates that there has been steady progress in terms of research and application of mobile devices in different domains (Parsons, 2014) and it continues to adapt to changing technologies.

Mobile technologies have undergone tremendous changes in the last few years. Initially, mobile phones were only used to make voice calls. However, voice calls today only constitute a miniscule percentage of the tasks that are performed on mobile phones (Hylén, 2012). Added to that, mobile devices have proliferated in the form of tablets and phablets which perform tasks that were once unique to either phones or personal computers (Lemlouma & Layaida, 2004). Together with Internet technologies, mobile technologies have changed the way people gather information and learn new things. In this context, it would be interesting to learn how organisations are harnessing these new technologies for knowledge transfer.

Some organisations are already experimenting with this new method, while others have not yet started (Berking, Archibald, Haag, & Birtwhistle, 2012). Despite active conversations in conferences and events organised by professional bodies such as the Association for Training Development (ATD), Training Industry, and MLearn, mobile learning is yet to see significant adoption in corporate organisations. This corroborates my observation over the past two decades working with organisations across the globe as a professional e-learning and mobile learning service provider to corporate organisations. Mobile learning can still be considered to be in its infancy

(Brown & Mbatia, 2015) when it comes to its adoption in the day to day context of corporate training.

As the co-founder and CEO of an e-learning company that provides technology enhanced learning services to corporate organisations across the world, I was intrigued by the reluctance of most organisations to adopt mobile learning in spite of its obvious advantages. I wanted to understand why corporate organisations are still hesitant to formally integrate mobile learning into their training programmes, as a result of which I engaged in many formal and informal discussions with people in the corporate sector; it is the culmination of those discussions that has given shape to the final topic of my thesis.

The purpose of this research was to find out how corporate training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established, how they view mobile learning relative to e-learning and the relationship between the two, whether they think it is or would be effective and the reasons for their assessment, and the reasons behind their adopting or not adopting mobile learning in their organisations. The research comprises three case studies on the experience of three corporate organisations in using e-learning and exploring the initial stages of adopting mobile learning to train their sales and service staff.

1.2 Understanding the Context for E-learning and Mobile Learning

1.2.1 Training in Organisations Today

Since the main topic of the thesis is mobile learning and its application in corporate organisations, it is essential to understand the general training environment and structure in organisations today. A corporate organisation may be defined as a legally independent business organisation that provides goods and services to its customers with the intention of making profits for its stakeholders (Davies & Gower, 1997; InvestorWords, 2014; USLegal, 2014).

Traditional instructor-led classroom training remains the most popular form of training delivery, accounting for more than 57% of the annual training budgets of organisations in North America (ATD, 2016). E-learning usually takes the form of self-paced modules hosted on a Learning Management System (Gilroy, 2001, p. 1). It is the second most popular format of training delivery with about 29.26% of formal training hours spent on self-paced learning (ATD, 2016). More interactive formats of e-learning such as collaborative online learning, simulation learning, and network enabled learning are rare (Chen, 2008). Mobile technology accounts for only 2.13% of the total training hours as per the 2016 State of Industry Report by ATD. Considering that it was collected from 310 organisations across the globe representing diverse geographic locations and industry verticals, the data provides a fair representation of the actual state of training affairs in corporate organisations.

This also mirrors my observations over the span of two decades of my career in the training domain, which I will outline in more detail in *section 1.3 (Motivations for This Study)*.

However, the fact that technology has been increasingly employed to deliver training, and that the number of formal learning hours devoted to traditional classroom training is decreasing steadily over the years cannot be ignored. In this context, as a precursor to investigating mobile learning, it is essential to understand why organisations adopt e-learning.

Every organisation has different departments to handle its various functions and invests its time and resources in ensuring that their staff is adequately trained to do their jobs well. This is especially true for the sales and service staff whose success in expanding their organisations' market share by bringing in new customers and maintaining excellent business relationships with existing customers helps organisations grow by continuing to bring in revenues. It is not surprising that this is a group that most training managers focus on even when budgets are tight. Given their strategic importance to an organisation, I thought it would be apt to choose this group as the participants of my research, along with training managers.

1.2.2 About E-learning

E-learning can be defined as learning that is electronically mediated (Parchoma, 2006). It can also be defined as learning content comprised of multimedia, electronic, and Internet technology delivered to large, geographically distributed staff. E-learning as a means of knowledge transfer began in the late nineties but started to gain momentum in corporate organisations around the year 2000 (Cross, 2004).

In the corporate sector, e-learning has been primarily viewed as electronic content delivered to employees on a desktop or laptop using technology (Clark & Mayer, 2016, p. 7). Because historically, moving to e-learning involved corporates in developing an online platform on which to host the content, when corporates considered implementing e-learning, naturally their concern and focus was on technical aspects, that is, on hosting technology. Bespoke content was also a central concern, with prominent issues concerning respecting commercial sensitivity and confidentiality, and the procedures via which content was commissioned and developed. Given that the investment required was typically very significant, it is understandable that organisations would focus on budgetary aspects. So, e-learning in the corporate sector came to be viewed mainly as being about creating secure “platforms” and “programmes” based around specific “content”. However, subsequent experience in usage has showed that successful implementation requires more than just a focus on technology (Roberts, 2009). Organisations have realised that the importance of content usage or the strategy for

implementation was as important as the successful commissioning of learning content because it was not enough just to have content hosted online, if the content didn't help achieve training results. As a result, the focus has gradually moved towards assessing 'outcomes' (which is regarded as very difficult) and identifying 'training needs', rather than just on investment and platform development strategies (Rose, 2009a). A common current point of discussion is on how training needs determine the delivery choice. That discussion has involved consideration of widening the types of media and modes of delivery that are considered. For example, typical e-learning (in the form of text and multimedia) has begun giving way to other formats as well (podcasts, for instance). It is in this context that m-learning (discussed in more detail later) has begun to be discussed. On the other hand, "the history of e-learning implementation is littered with stories of wonderful learning content withering unused" (Rose, 2009b). So, there is clearly an ongoing need for a balanced approach to all aspects of learning. There is currently a focus on integrating different technologies together, and also on the development of content that can be used across different technologies. There is also a tension about relations between e-learning and other forms of training, and how to develop business cases for e-learning investment given that assessing 'outcomes' or 'efficiency' remains problematic from the point of view of corporate strategists. What is noticeable is that a strong emphasis on learners too often remains missing, even though there are repeated token acknowledgements that the "workforce is an organisation's number one asset". Even the identification of 'training needs' often starts by considering corporate strategies rather than learner development. Today, e-learning in

corporate sectors is very widespread. Gradually, discussion is emerging about how that e-learning might be made more learner-centric.

I will explore more details in *Chapter 2, Literature Review*. However, the consideration of a few prominent points of view below will help to immediately set the scene.

E-learning is used both by educational institutions and corporate organisations and has seen rapid growth in the corporate context in the last few years (Fe-ConE, 2007).

Corporate organisations were finding e-learning an effective method for educating and training their staff (David, Salleh, & Iahad, 2012; Strother, 2002). Even academic research shows that the use of e-learning in businesses has been growing and will continue to grow (Bystrova, Larionova, Osborne, & Platonov, 2015; Rosenberg, 2005; Sambrook, 2003; Schweizer, 2004; Wentling, Waight, Strazzo, File, Fleur, & Kanfer, 2000).

“The mission of corporate e-learning is to supply the workforce with an up-to-date and cost-effective learning programme that yields motivated, skilled, and loyal knowledge workers” (Driscoll, 2000). Josh Bersin, the founder and Principal at Bersin by Deloitte, a leading provider of research-based information on professional development and other services, claimed that, “Ultimately, the goal or purpose of e-learning in organisations is to improve organisational efficiency and effectiveness” (Bersin, 2009). These are

the perspectives of the organisation. From the point of view of the staff, the mission of e-learning is to enhance individual and organisational performance (Rosenberg, 2005).

These two perspectives might be aligned when individual training needs and interventions arise from organisational goals. In such cases, the benefits of training would be numerous and accrue to both the individual and the organisation in terms of improved employee skills, knowledge, attitudes, and behaviours, and result in enhanced performance, job satisfaction, productivity, and profitability (Aguinis & Kraiger, 2009). That said, corporate e-learning primarily aims to improve organisational efficiency; promoting the education of workers is incidental (York, 2009). It should not be assumed that the goals of the organisation and the employee are always in harmony and this issue might be uncovered in this study.

This study aims to address both the organisation's and the individual's perspective. In a benchmark survey conducted across US and Canadian businesses, it was found that e-learning was being used mainly for training in the area of information technology (IT) skills (e.g., programming skills) (Skillsoft, 2001). As a method of delivery for corporate training, e-learning is still in the growing stage in many organisations. This is especially true of non-information technology organisations, where the main method of imparting training continues to be classroom training, although it is time-consuming and expensive and requires substantial logistical support.

1.2.3 About Mobile Learning

A very simple and common definition of mobile learning (Prasad, 2020, p. 37) or m-learning is that it is learning that takes place when individuals access information through portable and easy-to-carry mobile devices. Another simple definition of it is “the delivery of content specifically using mobile technology such as smartphones and tablets”(Gaul, 2019). Mobile learning means that the learner is not tied or 'tethered' physically to a location or device, and so definitions of mobile learning are less focused on technology when compared to those of e-learning. However, mobile learners typically learn through portable, lightweight, electronic, wireless devices that are small enough to fit one’s pocket, purse, or hand (Kukulka-Hulme & Traxler, 2005).

Nevertheless, accessing learning content through mobile devices from any location is just one (and the most acknowledged) aspect of mobile learning, among others. Mobile learning has been defined as learning that occurs during person-to-person mobile communication (Nyíri, 2002). I will explore this and various other aspects of mobile learning in the literature in *Chapter 2, Literature Review*.

For present purposes, it is necessary to briefly consider the perceptions of corporates about mobile learning. Although it took some time for its predecessor, e-learning, to be viewed as an effective way of delivering training content, in the case of mobile learning, its claims for ‘anywhere, anytime’ access seems to have led to fairly quick acceptance, at least at a

rhetorical level and it would also appear that employees are already quite enthusiastic about this medium. Most of us use mobile devices in our everyday life (Google research reports that 80 percent of people use smartphones). Employees in corporates are no exception, even if they use mobiles informally and for their personal learning needs, and even if they happen to be working in organisations that may not have any formal mobile learning strategy in place yet. But it is a fact that more and more people are using their mobiles to access information when they need it. Its increasing importance is likely to augur well for its formal adoption at the workplace as well, the reason being that the way we work is beginning to change, with people expecting to use tools that they use in their personal lives on the job as well (Gaul, 2019).

The motivation for training professionals seems quite high as well, even as they may be grappling with how exactly to go about tapping this versatile medium for maximum impact. According to ATD Research, “For talent development professionals, [the] relationship between mobile use and learning effectiveness provides motivation to work more aggressively on improving and expanding mobile delivery. The need to support greater individual and organisational agility, in which learning on-the-go can play a constructive part, providing an additional impetus to expand mobile e-learning capabilities (as cited by Gaul, 2019).” What seems evident from corporate discussions of m-learning is that there is a more explicit focus on learners and their preferences than has often been the case for e-learning more generally

even if, as I shall explore below, the learners themselves are often conceived in abstract ways.

One avenue for discussion starts by noting that employees will likely be using mobile technologies anyway. The advent of mobile technologies and wireless devices has opened up more options for training managers and staff in addition to existing technology enhanced methods (Pimmer & Grööhbiel, 2008). According to a report by the World Bank titled 'Information and Communication for Development 2012: Maximizing Mobile', close to 75% of the world's population has access to a mobile telephone (Kelly & Minges, 2012). Learning through mobile devices such as laptops, mobile phones, and tablets is being researched extensively (Peters, 2007). Learning on these devices has already found traction in schools, universities, and institutes of higher education (Gutierrez, 2012). This kind of “untethered” learning is also seen in a few corporate organisations (Cognizant, 2012; Rose, 2009b; Sum Total, 2011).

Another reason commonly suggested as to why organisations might seriously consider mobile learning is to do with its attractiveness to young employees. The new generation workforce, the millennials – people born between 1981 and 1996 – would constitute the majority of the world's workforce by 2030 (Schadler, 2013). The ‘millennials’ are said to be generally more technology savvy and digitally connected, more comfortable with mobile technology, preferring mobile learning [learning through handheld devices (Traxler, 2005)] over e-learning [learning through a computer (Behera, 2013)] in their

workplace (Heskett, 2007). They might have already used mobile learning considerably during their higher education. However, from a critical point of view, it is difficult to generalise that all 'millennials' have advanced technological abilities or to assume that such abilities would automatically translate into positive experiences of mobile learning.

Nonetheless, it is reasonable to consider that organisations might consider leveraging mobile learning to train the millennials. In my study, I was also interested to know whether corporations considered the demographics of their staff when selecting mobile learning as a part of their overall training and development strategy.

Although there are many research studies conducted on the use of mobile technology in learning (Peters, 2007), the research is more "pragmatically-driven than theoretically-informed, and less well documented" (Traxler, 2018), especially in the domain of corporate training and development. Although there has been a sharp increase in research into mobile learning in recent years, it has been mostly confined to educational institutions, both compulsory and post-compulsory, focusing on informal learning. Mobile learning in the corporate learning environment has not been studied as much (UNESCO, 2013). In this situation, how does the corporate sector view learning via mobile devices? An understanding of the relationship between e-learning and mobile learning could provide a useful contribution to addressing this question.

1.2.4 Relationship Between E-learning and Mobile Learning

The terms e-learning and mobile learning were coined at different times. E-learning has been used in corporate organisations for almost two decades (Cross & Hamilton, 2002; Fenn, Raskino, & Gammage, 2009), whereas mobile learning is still emerging (Traxler, 2007). Mobile learning is often adopted where e-learning is already established. and this relationship needs to be studied (Kukulska-Hulme & Traxler, 2005; Sharma & Kitchens, 2004; Traxler, 2005). In my earlier though limited study (as part of the Doctoral Programme), “From E-learning to Mobile Learning: Perceptions and Experiences of Corporate Training Managers” (Prasad, 2013), I examined organisations in the advanced stages of e-learning usage but only in the early stages of mobile learning and found that training managers in the corporate world largely view mobile learning from a techno-centric perspective, more through the lens of e-learning, which is why it is imperative to understand e-learning as well (Prasad, 2013).

When these findings were superimposed on Traxler’s model that depicts the commonalities and differences between mobile learning and e-learning, (Traxler, 2005) (Figure 1.1), it was clear that the respondents were still grappling with concerns about screen size, connectivity (tracking mobile learning through the LMS), interactivity (authoring tools), multimedia (Adobe Flash issues), and hyper-links (browser issues) which are features typical of e-learning. Respondents therefore limited their understanding of mobile learning mostly to e-learning delivered on mobile devices. They also viewed

mobile learning as a tactical extension of e-learning with only one-to-one learning (institutional), as opposed to its potential use as a collaborative platform for informal and formal learning (Hamdan & Schaper, 2011).

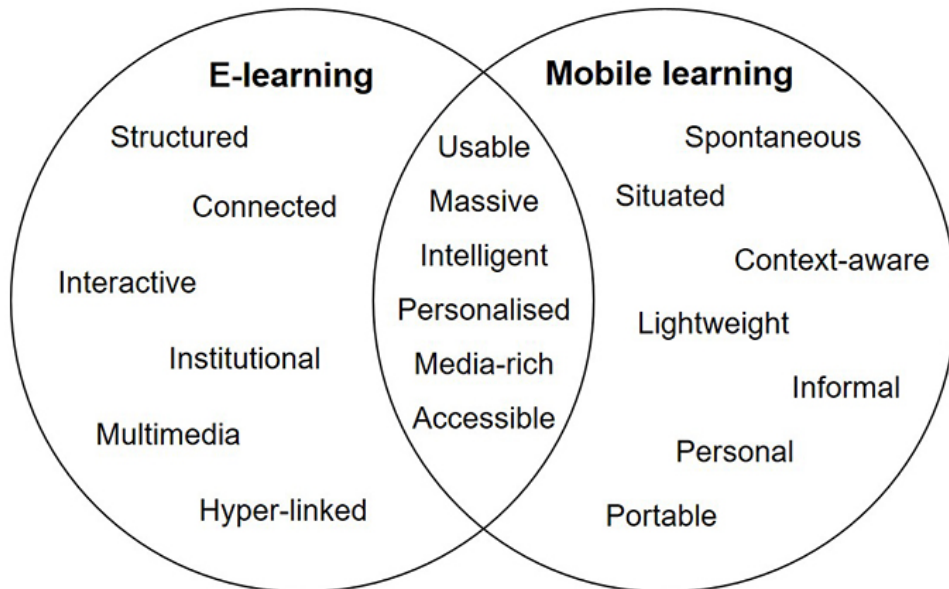


Figure 1.1 Traxler's model - commonalities and differences between e-learning and mobile learning

It appeared there were deep issues of how mobile learning was viewed and used in these particular contexts (Winters, 2006, pp. 5-8). This study seeks to elaborate on actual mobile learning issues, capture concerns with the more traditional e-learning, and map some of the relationships between these different concerns.

1.3 Motivations for This Study

As mentioned earlier in this chapter, I have been engaged in the fields of corporate training, e-learning, and mobile learning in corporate settings for thirty years, of which the last nineteen years were spent in establishing and managing an e-learning company with a vision to provide end-to-end technology enhanced learning services to corporate organisations. My organisation has been providing e-learning and related services to more than two hundred corporate organisations in thirty-three countries to date.

Although I started my career in Marketing & Sales after my MBA, my deep interest in learning and teaching led me to a career in University teaching where, as a University Grants Commission (UGC) qualified lecturer, I taught Management subjects to MBA students at Osmania University, India, for five years. The teaching experience propelled me to into a career in corporate training which I believed would be more dynamic, challenging, and produce more tangible results. I subsequently held senior management positions, particularly in corporate training functions, in some of the largest corporate organisations in India.

With the advent of e-learning in the early 2000s, I came to believe that technology was going to revolutionise the training function just as it would many other business functions. I sensed a great future and opportunity for someone with my background and interest in technology enhanced learning and training. It motivated me to take the plunge as an entrepreneur and I

started my company in 2000. In some ways my predictions have come true: Information, Internet, and mobile technologies have indeed changed the way corporate organisations train their staff. The growth of my company from a two-person start-up to a multimillion-dollar global e-learning company with 150 employees over two decades is a testimony to the rapid adoption and growth of technology in corporate training.

My job as the CEO and Chief Learning Architect of the company I have built is primarily centred around understanding client requirements, tailoring custom solutions to address their disparate needs, and closely interacting with clients. Most of my clients are multi-national, multi-location, multi-product global organisations that regularly figure in the Fortune 500 and Global Fortune 1000 lists. During these interactions, whenever the topic of mobile learning comes up, I sense a continuing hesitation on the part of training managers in adopting it. Understanding and exploring the reasons for that hesitation would be greatly beneficial to client organisations (as well as my own).

The inspiration for this research project stemmed from a desire to investigate the effectiveness of mobile learning in the context of corporate training, and to explore the emerging issues in greater detail. I observed certain trends in corporate e-learning and mobile learning, and issues and problems in the adoption of mobile learning as described by customers of my own company (who were already using e-learning), which led to a desire to investigate these problems in concrete settings. I wanted to help my clients overcome these through a better understanding of early adoption of mobile learning and to

contribute to the academic literature on the topic of mobile learning, as there was a clear need for more research on how mobile technology impacts learning, in order to improve its implementation (Ally, 2013) in corporate organisations.

My interest in the topic was informed by reading a variety of academic literature on mobile learning in academic settings, which motivated me to sign up for the PhD programme in E-Research and Technology Enhanced Learning at Lancaster. The programme provided me more opportunities to read up on the academic literature on mobile learning, but I was not fully satisfied with the current research on mobile learning, especially in corporate settings. I felt there were certain lacunae that needed answers. I used the modules in Part 1 of the programme as an opportunity to undertake small-scale studies on the topics of e-learning and its relationship with mobile learning as perceived by corporate organisations.

Those studies served as a precursor to the work I describe here, and I will occasionally refer to them throughout the text. In short, my findings were that, when compared to mobile learning in universities, the entire cycle of mobile learning in the corporate environment appeared to be very dynamic, addressing specific problems of practice that needed immediate resolution. On the other hand, aspects such as formal assessments were perhaps considered less important for motivating staff. My desire in the project described in this document was to investigate this situation in more detail and explore these issues more thoroughly.

For this research, I developed case studies that elaborated on actual mobile learning issues in the real-world corporate setting as perceived by training managers and sales and service staff of the organisations I studied, as well as concerns with more traditional e-learning, and map some of the relationships between these different concerns. This study focuses on the training managers and sales and service staff of three corporate organisations that have been using e-learning to train their staff for at least ten years, not only on IT-related skills but also on products, processes, and policies. These companies belong to different industry segments (healthcare, computers, financial services), and in different geographic locations (North America, Australia, and Asia).

I wanted to find out how corporate training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established. In my experience, the introduction of mobile learning in organisations was heavily influenced by the organisation's local history of using other forms of e-learning. The aim of the study was to examine settings where the use of e-learning was relatively more mature but mobile learning was in the early stages of adoption. I wanted to know whether organisations thought it was or would be effective and the reasons for their assessment. I also wanted to discover the reasons for their adopting or not adopting mobile learning in their organisations.

I was also keen to address two perspectives – the organisation's and the individual's. Corporate e-learning primarily aims to improve organisational efficiency and the education of workers is in some sense incidental; in other words, there are different interests and points of view at play within any organisation. It should not be assumed that the goals of the organisation and the employee are always in harmony, and I wanted to uncover this issue in the study.

I was also interested to learn whether corporations considered their staff demographics when opting to use mobile learning as a part of their overall training and talent development strategy.

In attempting to uncover the perceptions and experiences of training managers and sales and service staff with e-learning and mobile learning, I wanted to find out how corporate organisations and staff view mobile learning – do they see it as a completely new way of learning, an extension of e-learning, or another methodology in their arsenal? Do they think mobile learning can be used for difficult and important subjects? Can it only be used to reinforce earlier learning or as a performance support for just-in-time learning? In other words, do they feel that mobile learning can help them learn something substantial and useful? What do they think are the current bottlenecks in adopting mobile learning, and how do they foresee the future of mobile learning?

It was interesting and useful to learn from relevant training managers and sales and service staff if there really was a paradigm shift from traditional classroom or self-paced e-learning to the less formal, more open, more truncated, but more collaborative mobile learning. Are we witnessing or going to witness a new and revolutionary way of how people learn at work?

By investigating how various dynamics of practice played out in several organisations, I could highlight how the different local circumstances influenced the practices of mobile learning. In other words, even though relatively similar mobile learning platforms might be introduced and used in different organisation in different ways and for different purposes, they might also be perceived differently within those organisations. Through my study, I hoped to uncover the real reasons that drive the adoption of mobile learning.

1.4 Research Questions

I chose my questions based on the priorities I discovered earlier in the chapter about how organisations where e-learning is already firmly established experience the adoption of mobile learning, and how they perceive the relationship between the two, about the key aspects of mobile learning as understood in organisations, their key objectives (reasons) for deploying mobile learning, and the dynamics of actual mobile learning practice.

1.4.1 Main Question

How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?

1.4.2 Sub-questions

- 1.4.2.1 How do training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices?
- 1.4.2.2 What are the perceptions of training managers and sales and service staff about the reasons for adopting mobile learning?
- 1.4.2.3 How do corporate training managers perceive the benefits and limitations of mobile learning approaches when used in practice, with different members of sales and service staff, in particular, the 'millennials'?
- 1.4.2.4 Are there any discernible differences in the perceptions of mobile learning with different members (training managers and sales and service staff)?

1.5 Structure of my Thesis

I have divided my thesis into seven chapters. *Chapter 1 (Introduction)* sets the context for understanding e-learning and mobile learning and outlines my motivation and research questions for the thesis. *Chapter 2 (Literature Review)* sets the context and scope for the research by examining existing literature on e-learning and mobile learning in the corporate sector, and the influence of context on mobile learning adoption in corporate settings. It also highlights gaps in literature which I believe my research has contributed to filling in a small way. *Chapter 3 (Theoretical Framework)* describes the structure that supports and forms a frame of reference for the research study. *Chapter 4 (Research Design)*, although traditionally a part of the theoretical framework chapter, is dealt with separately in my thesis because it warrants the detail with which it has been outlined. *Chapter 5 (Findings)* consolidates my findings on the three case studies based on the data collected from the sales and service departments of three corporate organisations and gives an analysis of the findings from the three case studies by drawing out the similarities and differences among the organisations studied. *Chapter 6 (Discussion)* positions these findings in the wider literature. *Chapter 7 (Conclusion)* provides a summary of my main findings from the analysis of the data and discusses how the study answers my research questions. It also outlines the limitations of the study, covers my contribution to research knowledge and to practical knowledge for the corporate sector, and contains possible implications for future research.

2 Literature Review

2.1 Introduction

There are several purposes of the literature review that are fundamental and crucial for any research project. I have followed the guidelines listed by Boote and Beile (2005) with the objective that this review will serve as a foundation to my research. The objectives of this chapter are as follows:

- a) To set the context and scope for the research and set clear boundaries of the current research by setting a frame of reference to circumscribe the relevant area of research
- b) To situate the existing literature in the broad canvass of scholarly and historical context
- c) To delineate the claims from existing research and carefully examine the research methods used to evaluate the robustness of the claims
- d) To identify the gaps in literature that this research has an opportunity to fill
- e) Finally, to summarise the relevant research and synthesise the content in order to present a different and new perspective

Every attempt has been made to ensure that the project starts on a good foundation in literature and that the literature review identifies how the project might contribute to that literature. The literature that was studied and reviewed essentially revolved around mobile learning. It was also decided that it is relevant and beneficial to study its predecessor, e-learning, and the influence of context on technology integration in corporate organisations. These three domains of research were studied in the corporate training environment.

This chapter has six sections:

- a) Introduction, which locates the project within the context and overall research, and sets out the search strategy adopted, and the analysis done
- b) E-learning in the corporate sector
- c) Mobile learning in the corporate sector
- d) Impact of context on technology integration in the corporate sector
- e) Summary of the literature review
- f) Identification of gaps in the literature and implications for the study

2.1.1 Locating the Project

In general, academic researchers work within disciplines, fields, and specific research communities, and their knowledge is published and presented in relevant academic and professional journals, conferences, and forums that are typically associated with those specific academic disciplines, fields, and research communities. Those disciplines, fields, and communities are neither watertight silos nor static. Instead they continually evolve, adapt, and interface with other scholarly communities and stakeholders (including funders) in ways that influence their trajectories and impact their boundaries (Traxler, 2018). There are some researchers or projects that might position themselves as 'interdisciplinary' or 'trans-disciplinary' because they draw from multiple areas of literature. But even then, the fact remains that research essentially remains compartmentalised, albeit with more permeable boundaries.

This project sits at the intersection of several areas of research literature. Some are directly related to my focus of research and others are related more indirectly, although they are all relevant to the overall goal of improving knowledge, skills, and attitudes of staff in a corporate environment. The research subjects that are directly related to my research are:

- a) E-learning in the corporate sector
- b) Mobile learning in the corporate sector
- c) Influence of context on technology integration in the corporate sector

These three areas are taken strictly within the environment of the corporate sector. The last domain, the ‘influence of context on technology integration in the corporate sector’ assumes importance and relevance because technology is being increasingly and pervasively used in corporate organisations to enhance learning in all aspects of its function – identifying training needs, designing and developing learning programs, deploying them, and finally, monitoring and evaluating the training effort (ATD, 2018).

Given below is a brief explanation of each of the three research areas.

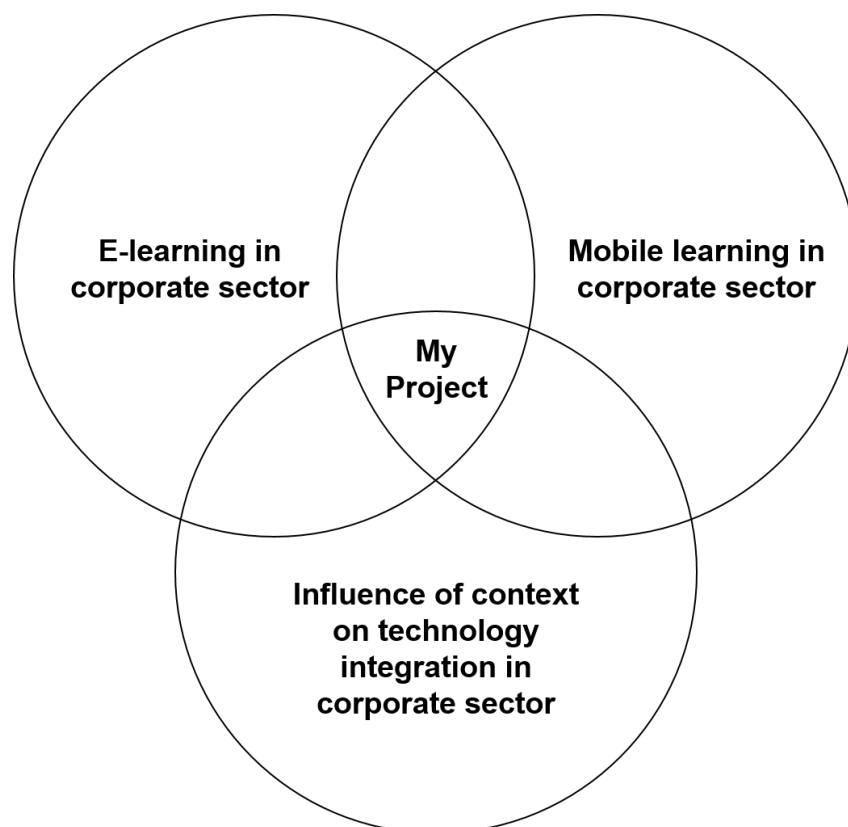


Figure 2.1 Diagrammatic representation of the research areas focussed on

2.1.1.1 Area of Literature 1: E-learning in corporate sector

The phrase, 'e-learning in the corporate sector' is a generic one commonly used to denote the application of e-learning strategies, processes, tools and technologies, and practices in a corporate organisation with the objective of enhancing the knowledge, skills, and attitudes of their staff. The terminal objective of any training in a corporate organisation is to improve staff productivity and achieve organisational goals. From this domain of research, I wished to study the e-learning strategies, processes, practices, and the perceptions of the training managers and sales and service staff on its effectiveness in achieving the learning objectives. I also wished to compare this knowledge with that of mobile learning.

2.1.1.2 Area of Literature 2: Mobile learning in corporate sector

The term 'mobile learning' in the corporate sector denotes the usage of mobile devices to deploy e-learning and digital learning content, offering learners the convenience of truly anywhere and anytime learning. In this research domain too, I wished to study mobile learning and its practices and perceptions. As it is a relatively recent practice in organisations, I hoped to fill important gaps in the existing literature.

2.1.1.3 Area of Literature 3: Influence of context on technology integration in corporate sector

This phrase has been coined to denote the phenomenon of how the context and situation in which technology is introduced influence its integration into the company's existing technology infrastructure, processes, and practices, including the perceptions of training managers and sales and service staff.

I wished to study how and to what extent context enables or restrains the integration of learning technology into the training function. In my project, this domain of research assumes relevance as it impacts the adoption of mobile learning and influences the perception of its training managers and sales and service staff.

My research objectives lie well within these three research areas, and my project in this dissertation will aim to contribute to these areas of literature.

The objectives of my research are to discover the perceptions of training managers and sales and service staff regarding:

- a) The effectiveness of mobile learning in corporate training settings
- b) The relationship between mobile learning and wider e-learning practices
- c) The reasons for adopting mobile learning
- d) The benefits and limitations of mobile learning approaches when used with different members of sales and service staff, in particular, the 'millennials'

I believe that my research will uncover and examine the perceptions of the training managers and sales and service staff on the effectiveness of mobile learning, its relationship with e-learning, and the reasons for its adoption in business organisations.

I acknowledge that my project could have drawn on other relevant areas of literature that are closely related to mobile and e-learning, such as corporate training and development at a generic level, or micro-learning and just-in-time performance support at a very specific level. I had consciously chosen not to draw upon these research areas when formulating this project because I felt that these areas, if included in my research, would dilute the focus of my research objectives and my research findings would be too broad to be of substantial value. On the other hand, I firmly believe that the three areas of literature I am going to draw upon will constitute an adequate basis for making a doctoral-level contribution to the academic literature.

2.1.2 Searching for Literature to Review

The first step towards literature review is to identify existing literature in the field of mobile learning, which was done in two stages:

In the first stage, a search strategy was adopted to explore specific pieces of content that are contextually relevant to mobile learning, e-learning, and the influence of context on technology adoption. For this purpose, I used popular academic search engines such as Scopus, Academic Info, Archival Research

Catalogue, Eric, and Google Scholar. When piloting the search strategy I used search strings such as *'mobile learning in workplace'*, *'technology-enabled-learning at workplace'*, *'role of mobile technologies in corporate training'*, *'perceptions of training managers about mobile learning'*, *'do training managers think mobile learning is effective?'* and *'effectiveness of mobile learning in corporate organisations'*.

In the second stage, the search terms were shortlisted based on the success rate of relevant articles that showed up in the search string. For example, when *'mobile learning at workplace'* did not produce useful results in a particular database, the search string was changed to:

- Technology-enabled-learning at workplace
- Just-in-time learning for employees
- Workplace learning
- Employee training
- Corporate training and e-learning

This was done for each of the search terms shortlisted in the first stage to arrive at relevant research.

I also identified two journals which were specific to my subject of study:

- International Journal of Mobile Learning and Organisation
- International Journal of Mobile and Blended Learning

Since those journals have a scope that is directly related to my study, I specifically searched them for relevant articles that met the same criteria I listed above. I did not specifically search other journals in this way, such as "International Journal of Interactive Mobile Technologies", since their scope is more focussed on technology aspects than mobile learning.

My choice of sources were also influenced by Traxler's observation that academic communities of practice related to mobile learning are seen only at dedicated international conferences such as MLEARN rather than in dedicated journals (Traxler, 2007, 2018) – an observation I found to be true even after a decade. Therefore, I didn't confine my search to journals, but also explored all forms of literature, such as conference papers, academic papers, theses, and books that were broadly in-line with the subject of my thesis.

Because mobile technologies have evolved rapidly in the last few years, research published a decade ago would have become irrelevant in terms of existing technologies. Hence, I chose to confine my research to papers and literature that were published after 2013. Also, since my subject of study is specific to the corporate sector, I chose to limit my study to papers and articles relevant to the corporate training environment. However, I have chosen to include those articles or papers (though in the context of higher education) that might have applications in the corporate context as well.

The second stage involved 'filtering', where I shortlisted the pieces of literature (that emerged from the search strategy) based on the relevance to my thesis.

I did this by looking at the Abstracts of the articles I had collected, which I had exported into an Excel spreadsheet.

I studied these and shortlisted those that appeared to be relevant to my thesis topic for further review. As I studied the abstracts of the journal articles, conference papers, and academic theses, it was evident that mobile learning cannot be explored in isolation but has to be studied within the broader context of technology-enabled learning and e-learning.

2.1.3 Analysing the Literature

The purpose of this section is to explain how I have analysed the research papers in each area that I have focussed on – e-learning, mobile learning, and the influence of context on technology integration – in the context and environment of corporate training in business organisations. The method of analysing each piece of literature under these areas was almost the same. It started with reading each piece carefully and examining each piece for specific information that was useful to my research. To be more precise, the questions I had used to retrieve relevant information were:

- a) What are the questions or problems the paper tried to answer?
- b) What definitions does it use?
- c) Is it a general text or does it focus on a specific issue(s)?
- d) What were the key-claims made by the author(s)?

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- e) What are the key concepts being used in the argument or presentation?
 - f) What is the theoretical basis?
 - g) What kind of methodology was used to collect and analyse the data?
 - h) What were the research site(s) that were used to collect the data?
 - i) What were the key-claims made by the author(s)?
 - j) What are the key concepts being used in the argument or presentation?
 - k) What kinds of data does it use to back up its argument?
 - l) What conclusions does it reach?
 - m) What does the text in the paper say still needs to be done in the field?
 - n) How does this information compare with what is written by other authors?
 - o) What are the strengths and limitations of the study?
 - p) Is there evidence in the paper for answering my research questions?
 - q) Does it contribute to my understanding of the topic?

The last two questions were of marked importance to me as the objective of these questions was to identify gaps in the literature. By using my research questions as the analytical foci, I looked for evidence and claims about each of them in these papers even though a piece of literature may not share the same 'core' as my research. With this approach, I hoped to identify gaps in literature, even though the piece of research thus analysed did not directly

answer my research questions. In order to identify and highlight my priorities, I have used an excel sheet to organise the findings with a row for each paper and a column for each analytical priority. I then organised the materials into 'key themes', which I presented under each of the three research sections.

Although each of the above sections was relevant, I had devoted roughly similar length to the second and third areas but limited the coverage of the e-learning area to the relationship of e-learning with mobile learning, as my research is focussed on mobile learning, not e-learning per se.

By evaluating the literature and research that has already been conducted around these themes, I hoped to uncover gaps in addressing the questions of effectiveness of mobile learning and related questions that I had set myself to answer.

2.2 E-learning in Corporate Sector

The themes that emerged when I looked at e-learning in the corporate sector were the multiple definitions of e-learning in literature (one definition, by the Association for Talent Development, is particularly prominent and so I discuss it specifically), the advantages and disadvantages of e-learning, the attitudes and perceptions of training managers and sales and service staff regarding e-learning, and how mobile learning initiatives emerged in organisations to enhance existing e-learning initiatives.

2.2.1 Definitions

E-learning quite literally means electronic learning, and so any kind of learning that includes an electronic component can be deemed e-learning. Parchoma (2006, p. 92) describes it as “learning that is electronically mediated”. If one goes by these definitions, a classroom session with an overhead projector connected to a computer is also e-learning. The difficulty in defining the term e-learning is that it is too broad and open to multiple definitions, each addressing a distinct aspect that was found relevant or important. For example, e-learning has been defined in terms of the electronic or digital nature of delivery used to deliver instructions (Clark & Mayer, 2016). The emphasis here appears to be more on the device than the learning content, which was reduced to mere “instructions”. Zhang et al. (2004) and Welsh et al. (2003) improved upon the earlier definition when they defined e-learning as technology-based learning that delivers learning materials to remote learners through a computer network. Though the term ‘learning materials’ does not

specify the nature of the learning material, the definition addresses the nature of the learners being remote. The definition by Welsh et al. (2003) expands on the computer network to include intranets and the Internet, indicating learning material can also be accessed via a browser.

According to ASTD Handbook Glossary (Biech, 2014, p. 15), a compilation published by the American Society of Training & Development (now known as Association of Talent Development, ATD),

“e-learning is a term covering a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. Delivery of content may take place via the Internet, intranet or extranet [local area network (LAN) or wide area network (WAN)], audio- and videotape, satellite broadcast, interactive television, CD-ROM, and more”.

ATD’s explanation adds other aspects of technology but fails to clarify where the learning content resides and the nature and composition of the content. It does indicate, albeit indirectly, that e-learning can be synchronous, if a remote instructor is present who interacts with the learners in real time as it mentions virtual classrooms (Algahtani, 2011). E-learning can also be asynchronous which means that the instructor and learners interact with each other not in real time but at different individual times via an online discussion forum (Algahtani, 2011; Almosa & Almubarak, 2005; Garrison, 2011).

It is clear from the above definitions that e-learning cannot be viewed as a mere tool to deliver digital content to remote users. Rather, it is useful to understand it as an ecosystem of learning combined with technology with three principal dimensions – users, technology, and services. Here is a useful framework adapted from the one given by (Aparicio, Bacao, & Oliveira, 2016).

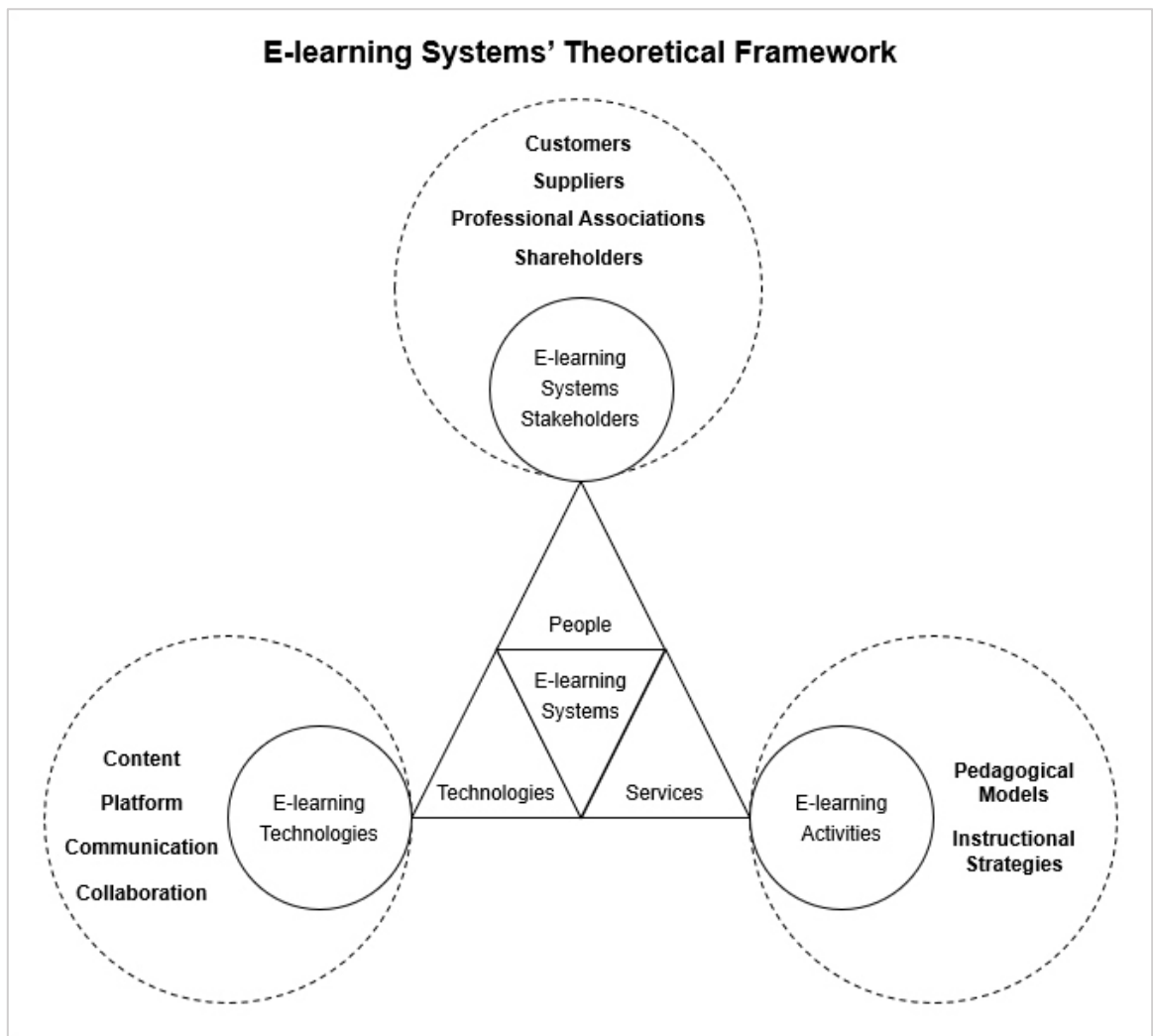


Figure 2.2 Adapted from E-learning Systems' Theoretical Framework (Aparicio et al., 2016)

As shown in Figure 2.2, there are several players, components, and activities that make up a holistic system of e-learning. The hosting platforms [learning management system (LMS) or learning content management system (LCMS)]

form an integral part of the system without which e-learning would be reduced to just content with no facility for training administration or reporting. It should also be noted that content may be in many forms from simple PowerPoint slides to more sophisticated online learning simulations with graphics, animations, and video and audio components (Hall, 1997). So, when we move towards a holistic description of e-learning, we find the users, components, and activities are fundamentally important to understand the phenomenon of e-learning.

Based on the definitions and explanations above, and taking into consideration my almost two-decade experience of providing e-learning and related services to corporate organisations, I have attempted to compile a more comprehensive explanation of e-learning, especially in the context of workplace learning –

“Corporate e-learning is a method for facilitating learning in which learning content is delivered to computers, sometimes via digital networks, so that members of the workforce can consume it, often asynchronously and at their own pace. The e-learning content, often developed specifically by or for the corporation, comprises packages of materials, such as text, visuals, graphic animations, interactive elements, practice sessions, formative assessments, and quizzes. The learning content is hosted on an online learning platform, which is usually secured so that only members of the workforce can access it.”

2.2.2 Advantages and Disadvantages of E-learning

Since its advent about twenty years ago (Cross, 2004), e-learning in corporate organisations is following a typical (normal) bell curve (Bersin, 2009) adoption and is currently in the growth and maturity stages. Advocates of e-learning argue that it removes the barriers of place, time, or situations; and enables just-in-time learning to a wider audience at reduced costs. Some of the critics of e-learning opine that e-learning has led to the commercialisation of education and reduced face-to-face interaction with educators, and questioned the ability of technology to facilitate deep learning (Kanuka, 2008). An often-bemoaned disadvantage of e-learning is the high dropout rate of its learners (Martinez, 2003; Tyler-Smith, 2006). Tyler-Smith attributes it to cognitive load, where there is an overload of information or tasks to be achieved and Martinez points out that e-learning (by virtue of its nature) expects a greater degree of self-motivation and self-directed learning and commitment from learners and if these are not addressed appropriately, would result in high drop-out rates.

In a study of a large-scale software training initiative, it was found that e-learning was successful in effectively training large numbers of employees in a short time. The e-learning solution offers not only the generally recognised advantages of any time, place, and pace learning, but also provides just enough knowledge and skills to perform the required tasks satisfactorily. It was found that e-learning, if based on contemporary

instructional design principles, like the whole task approach (Van Merriënboer & Kirschner, 2013), actually works better than classroom training.

These results were based on the method of valuation of training effectiveness at the first level (reaction) on the Kirkpatrick's model (Kirkpatrick & Kirkpatrick, 2009). It could have been more convincing had the researchers used higher levels of evaluation of learning and application than reaction level.

Studies trying to identify the factors that motivate learners to use e-learning found that user (learner) involvement was imperative for the success of e-learning in organisations (Park & Choi, 2009; Sun, Tsai, Finger, Chen, & Yeh, 2008). The study concluded that for e-learning to be successful, the stakeholders must ensure their learners enjoy e-learning as it results in their satisfaction and developing self-efficacy. E-learning would succeed when the objectives of the e-learning are met, usually performance-based learning objectives (Derouin, Fritzsche, & Salas, 2005). It is possible for an e-learning course to be engaging and entertaining but not contributing to learning.

2.2.3 Attitudes and Perceptions Regarding E-learning

For the purpose of this research, the attitudes and perceptions of training managers and sales and service staff regarding e-learning were examined.

In examining the attitudes of training managers towards e-learning, a study conducted in more than hundred top corporations in Turkey according to their number of employees, revenue, existence of training department, and current use of e-learning, found that most companies were willing to embrace e-learning but preferred to 'blend' it with their traditional training practices (Kimiloglu, Ozturan, & Kutlu, 2017). Regardless of their scale, most companies had a positive outlook toward e-learning and are currently on the verge of infusing it into their established practices. The perceived advantages are convenience, cost-effectiveness, and customisability, while the disadvantages were human-related issues of change resistance. Some may argue that one limitation of this study was if 106 out of 500 top companies in Turkey was a representative sample. Also, as the study was undertaken in Turkey, which straddles the developed and developing countries (Schneider & Scholar, 2017), it may not be a representative country to generalise these results on a global basis.

When it came to the perceptions of employees about e-learning, in a study conducted in a large Mexican organisation to evaluate employees' perceptions of three types of interaction (learner-teacher, learner-content, and learner-learner) and their views on the effectiveness of online courses in

terms of satisfaction, learning, and behaviours, it was found they valued their interaction with the content the most (Rodriguez & Armellini, 2013). They also opined online learning was generally effective and did not think there was any relationship between online interactions and training effectiveness, although other studies had shown a positive correlation between the levels of interactivity and training effectiveness (Hurst, Wallace, & Nixon, 2013). A possible explanation for this seeming contradiction can be that the organisation in which the study was conducted offered courses with extensive learner-content but few social interactions and so the respondents did not have relevant experience to compare with. A second limitation relates to the sampling plan with participants being non-probabilistic based on the subjective judgement of the researcher. A larger, probabilistic sample would probably yield adequate data for generalisation. Again, although the study used the higher application level of the Kirkpatrick's model to evaluate the effectiveness of learning, it collected only the learners' perceptions. The results would have been more robust had the researchers used the perceptions of their supervisors too (Phillips & Phillips, 2016).

2.2.4 E-learning to Mobile Learning

Since its arrival, e-learning continued to evolve in terms of its features, formats, and applications, and has made a quantum leap to the next phase of growth and adoption with its new format of mobile learning (learning through mobile devices). Mobile technology has spawned a number of portable devices giving yet another opportunity for training managers to train their workforce (Haag, 2011). Mobile phones, smartphones, personal digital

assistants, and mp3 players have enabled learners to learn while on the move (Traxler, 2007). With growing global adoption of mobile phones (Carlsson, Carlsson, Hyvonen, Puhakainen, & Walden, 2006; Kalba, 2008), the number of people using mobile devices has surpassed that of computer users (Čegan & Filip, 2017). The 'millennials' will constitute the majority of the world's workforce by 2030 (Schadler, 2013). These digital natives are more tech-savvy and are more likely to prefer mobile learning over e-learning in their workplace (Heskett, 2007). However, from a critical point of view, it is difficult to generalise that all 'millennials' have uniformly high technological abilities or to assume that such abilities would automatically translate into positive experiences of mobile learning. Nonetheless, it is reasonable to assume that organisations might consider leveraging mobile learning to train millennials. As mobile learning is personalised and contextualised (Byrne, Lonsdale, Sharples, Baber, Arvanitis, Brundell, & Beale, 2004), it is making organisations explore the potential of mobile learning and enhance e-learning with mobile learning initiatives (Trede, Goodyear, Macfarlane, Markauskaite, McEwen, & Tayebjee, 2016).

The ATD's State of the Industry report 2018 (ATD, 2018, p. 37) shows that about 32% of learning hours are spent on technology-based methods such as web-based and computer-based training, and virtual classrooms, with mobile learning occupying about 2.1% of learning hours.

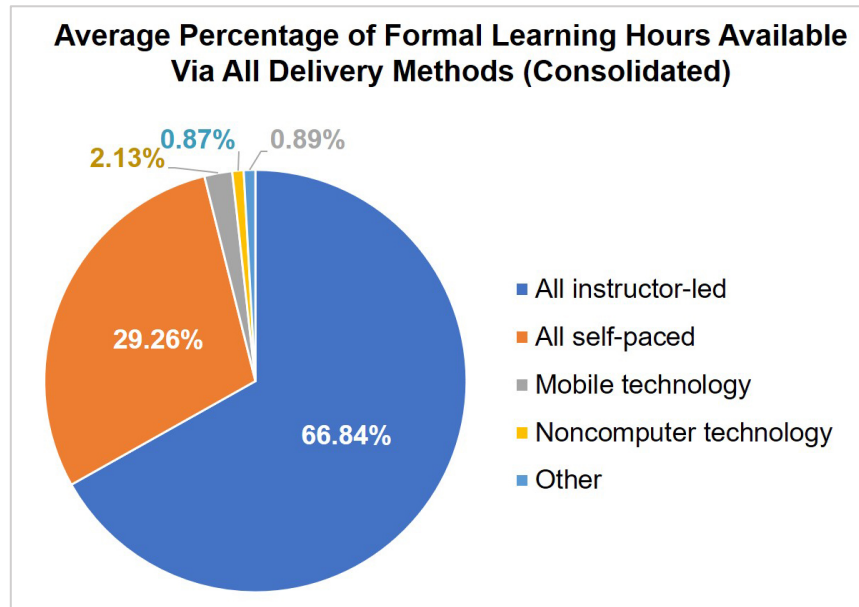


Figure 2.3 Average percentage of formal learning hours available via all delivery methods (Consolidated) (ATD, 2018)

The E-learning Guild Research Report of 2011, *Mobile Learning: Landscape and Trends*, says that although mobile learning in organisations is still in the nascent stage with only 10-20% of organisations having implemented it, interest was growing, tools were developing, and organisations had started enjoying the fruits (Quinn, 2011). Although there were many initiatives and research studies on the use of mobile technology in learning (Peters, 2007), research was sparse (Traxler, 2007) before 2010, especially in the domain of corporate training and development, and it was observed that very little research was done on the use of mobile learning in the corporate context. However, the trend has been changing and more scholars are researching the subject particularly from 2015, and there has been continual contribution to literature since then.

2.3 Mobile Learning in Corporate Sector

The themes that emerged when I looked at mobile learning in the corporate sector were various definitions in literature of what constitutes mobile learning, an overview of learning theories that help explain mobile learning, the advantages of mobile learning in training and the challenges in adopting it, and finally, the effectiveness of mobile learning as established by literature.

2.3.1 What is Mobile Learning?

Is mobile learning an extension of e-learning? Or is it any learning on a mobile device? One school of thought is that mobile learning is just an extension or subset of e-learning through mobile computational devices and a natural evolution of e-learning (Georgiev, Georgieva, & Trajkovski, 2006; Mostakhdemin-Hosseini & Tuimala, 2005). The other is that mobile learning is something wholly different, with new paradigms of teaching and learning (Kukulska-Hulme, Sharples, Milrad, Arnedillo-Sánchez, & Vavoula, 2009).

Mobile learning, as a concept, threw up many definitions and models, so much so that it became all things to all people (Winters, 2006).

According to ASTD Handbook Glossary (Biech, 2014, p. 15) a compilation published by the American Society of Training & Development (now known as Association of Talent Development, ATD),

“Mobile learning is learning that takes place via such wireless devices as smartphones, tablets, or laptop computers.”

Initial research by Sharples, Taylor, O'Malley, and their colleagues linked mobile learning to the device (Vavoula & Sharples, 2002) and its potential for lifelong learning (Sharples, 2000). Later research shifted the focus onto the mobility of the learner rather than the device, leading to the definition, “Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of learning opportunities offered by mobile technologies” (O'Malley, Vavoula, Glew, Taylor, Sharples, Lefrere, Lonsdale, Naismith, & Waycott, 2005).

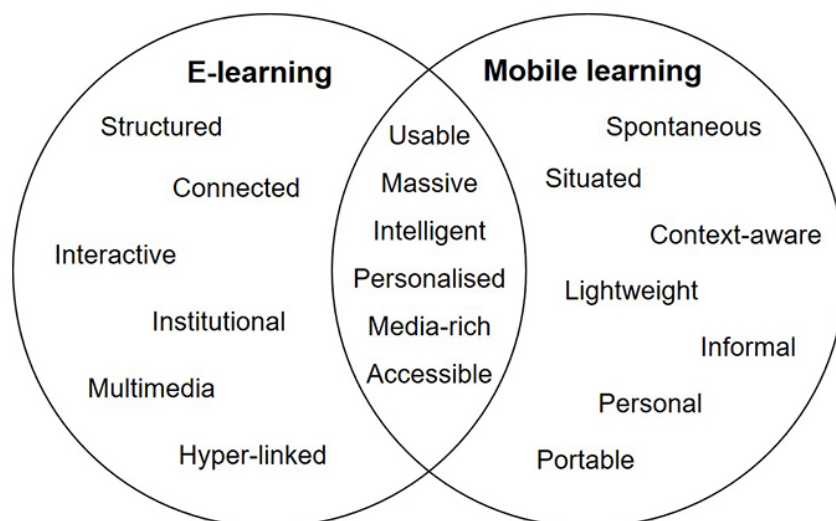
Clark Quinn (as cited by McManus, 2002) defined mobile learning as an “intersection of mobile computing and e-learning: accessible resources wherever you are, strong search capabilities, rich interaction, powerful support for effective learning, and performance-based assessment. E-learning independent of location in time or space”.

Polsani (2003) defined mobile learning as a kind of education that is produced, delivered, and consumed on a network. Quinn (as cited by McManus, 2002) and Pinkwart et al. (2003) classified mobile learning as e-learning that uses mobile devices for delivery. Mostakhdemin-Hosseini and Tuimala (2005) opined that mobile learning is just an ‘immediate descendant’ of e-learning.

It is evident that mobile learning is certainly not just learning that takes place on a mobile phone. It is important to keep in mind the relationship of mobile learning with 'conventional' e-learning (Traxler & Crompton, 2015) as well as the newer dynamics it has brought about. Mobile learning was initially defined in terms of its features – being personal, portable, spontaneous, opportunistic, informal, pervasive, situated, private, context-aware, and bite-sized. These features are quite different from the conventional and 'tethered' e-learning which often is structured, media-rich, broadband, interactive, intelligent, and usable. A definition that tries to include both these sets of features would blur the distinction between mobile learning and e-learning. If we consider what Traxler (2009) astutely observed, the power of e-learning technology will soon be available in mobile devices, and mobile devices would also overcome their limitations of interface design and size, processor speed, battery life, and connectivity issues.

The understanding of mobile learning started expanding as Hummel and Hlavacs (2003) emphasised on the ubiquity of mobile learning, when they described mobile learning as ambient computing environment of a multitude of systems, devices, and people who can access, communicate, and share content from anywhere and anytime, both synchronously and asynchronously. Mobile learning occurs during person-to-person mobile communication (Nyíri, 2002), when the learner is moving about and not 'tethered' physically to a location or a device, not just outside a classroom or their usual place of work. Another factor in the phenomenon of mobile learning, in addition to learning being on the move, is the use of portable, lightweight, electronic wireless

devices that are small enough to fit one's pocket, purse, or hand (Kukulsk-Hulme & Traxler, 2005). But according to Professor Mike Sharples, often referred to as the 'father of mobile learning', the mobility of the learner is more important than the device itself when it comes to defining mobile learning. He suggested that the guiding factor while defining mobile learning be that the learner should not be at a fixed, predetermined location (Sharples, 2005). The difference between e-learning and mobile learning becomes obvious when seen from a learner's perspective (Figure 2.4) instead of through a technology lens.



*Figure 2.4 Difference between e-learning and mobile learning
Adapted from Defining Mobile Learning (Traxler, 2005)*

The following table captures the changes that may be expected while moving from e-learning to mobile learning (Sharma & Kitchens, 2004).

Pedagogical Changes	
Current e-learning Methods	Mobile learning (wireless)
Predominantly text and graphic based content	Predominantly voice, graphics, animation-based content
Lectures in virtual classrooms	Learning in the field or while on the move
Instructor - Student & Student - Student Communication	
Asynchronous	Synchronous, interactive, and spontaneous
Face-to-face	Flexible
Audio-teleconference	Both audio- and video-teleconference
Fixed location	No geographic boundaries
Travel time to reach Internet site	No travel time because of wireless internet connectivity
Dedicated time for any group meeting	Flexible timings 24/7
Poor communication due to group consciousness	Rich communication, due to one-to-one communication
Presentations, Examinations, and Assignments	
Theoretical, text-based	Practical oriented, on-site, hands-on
Observe and monitor in virtual laboratory	Observe in the field and monitor from remote location
Class-based presentations	One-to-one presentations with much richer communication
Use of one language	Auto translation for delivery of instructions
Individualised, component-based group work	Simultaneous collaborative group work

*Table 2.1 Changes expected while moving from e-learning to mobile learning
(Sharma & Kitchens, 2004)*

Mobile devices and technologies are so pervasive and ubiquitous that they are increasingly changing the nature of knowledge acquisition and sharing in modern societies. This in turn, is altering the very nature of learning (both formal and informal) as it was known earlier. E-learning that was 'just-in-case' is now replaced with mobile learning that is '*just-in-time, just enough, and just-for-me*'.

Traxler (2005) defined mobile learning in terms of its technologies being predominantly handheld or palmtop devices. He also identified the characteristics of mobile learning to be 'spontaneous, private, portable,

situated, informal, bite-sized, light-weight, context aware, spontaneous, connected, personalised, and interactive'. But mobile learning with its multiple dimensions, like e-learning, needs a system approach to understand and define it. Peng et al. (2009) further built on that and described mobile learning as the use of ubiquitous technologies that are convenient, expedient, and immediate, to learn the right thing, at the right time, and at the right place. El-Hussein and Cronje (2010) added to it by describing mobile learning as learning where technology, learners, and learning are all mobile. According to Laouris and Eteokleous (2005), mobile learning added an important aspect by sharing 'systematic' and a 'systemic' characteristics, systematic meaning considering mobile and learning in isolation as well as in concert, and systemic meaning considering the inter-relations and interactions between technology, the learning environment, the philosophy, and the pedagogy. He believed what needs to be mobile is not the device but the learner along with his entire learning environment.

Finally, Mike Sharples et al. (2010) came forward with a comprehensive theory of mobile learning that tested positive against a set of criteria:

- a) Is it significantly different from the current theories of classroom, workplace, or lifelong learning?
- b) Does it account for the mobility of learners?
- c) Does it cover both formal and informal learning?
- d) Does it theorise learning as a constructive and social process?

e) Does it analyse learning as a personal and situated activity mediated by technology?

Based on the above criteria, Sharples et al. defined mobile learning as “the processes of coming to know through conversations across multiple contexts amongst people and personal interactive technologies”.

Will mobile learning replace e-learning? There is evidence that it will not, just as e-learning did not replace traditional classroom training (Biggs & Justice, 2011). Mobile learning, along with the other learning initiatives, will join the arsenal of the training managers to address training related performance problems in organisations.

Considering the various perspectives of mobile learning mentioned above and combining them with my own experience in mobile learning, I do not see mobile learning as a mere technological tool or a device that facilitates learning anywhere and anytime, or a method of delivering learning content on mobile devices, or just another version of e-learning. I see mobile learning as an absolutely new way of learning that is changing how knowledge is acquired in modern societies.

The following is my attempt at defining mobile learning:

“Mobile learning is a ubiquitous process by which humans acquire, assimilate, share, store, retrieve, and use knowledge and information by using and interacting with other humans, ICT, and mobile technology. The learners are connected, interactive, and mobile; the learning is spontaneous, personalised, private, situated, informal, and of short-duration; the learning content is digital, bite-sized, media-rich, and engaging; the devices are feature-rich, portable, and light-weight. The entire ecosystem is mobile, interconnected, and interacting in real-time with one and another to provide convenient, expedient, immediate learning that is in the right amount, at the right time, and the right place”. The application in the corporate sector is to deliver micro-learning and performance support to remote, travelling employees.

2.3.2 Advantages of Mobile Learning

Mobile learning, it is claimed, has most of the advantages of e-learning and some that are unique to it. It also has certain unique drawbacks that e-learning doesn't have. Heiphetz categorised the advantages of mobile learning from a corporate perspective under several themes that are by no means exhaustive (Heiphetz, 2011).

They are as below:

- a) Universal accessibility of content: Mobile learning allows organisations to reach workers in remote locations, providing truly anywhere, anytime learning, and allowing staff to personalise their learning schedules.
- b) Ability to adapt to disparate categories of workers: Mobile learning can provide learning and performance support at critical moments of need to employees such as technical field service and sales personnel, who find it difficult to attend a classroom session or sit in front of a computer.
- c) Better retention of acquired knowledge: A study by Fozdar & Kumar (2007) has shown that mobile learning results in increased retention as compared to classroom training.
- d) Collaborative learning: Mobile learning enables individuals to “have more social participation, maintain extensive interpersonal networks, and have contact with people not only within the social system but also outside it” (Suki & Suki, 2007).
- e) Customised training addressing the needs of the organisation: Usually it is the mobile employees such as top management and sales and field technical staff who find mobile learning most useful. As mobile learning can be customised, it can be used to address the training needs of the company’s short, medium, and long term goals in terms of ILT, e-learning, and mobile learning (Heiphetz, 2011).

2.3.3 Challenges in Adopting Mobile Learning

There are ample studies and success stories that indicate mobile learning is here to stay and is becoming an important tool in the arsenal of a training manager. However, mobile learning cannot be taken as a panacea for all training ills nor should it be considered a replacement for e-learning and classroom training (Shudong & Higgins, 2005).

There are clear and substantial challenges and obstacles in adopting mobile learning (Liu, 2011). Researchers have studied various barriers in adopting mobile learning.

- a) Shudong & Higgins (2005) studied the barriers under psychological, pedagogical, and technical categories. According to him, pedagogically, mobile learning is not easy to track or follow-up. In my previous research, I found that one of the primary concerns among corporate training managers was the difficulty in tracking learners' progress via an LMS as most LMSs do not track learning delivered through mobile devices (Prasad, 2013).
- b) Technically, the small screen size, difficulty in inputting data, limited memory, and lack of technical standards are hurdles to adopting mobile learning. Also, the inability of mobile devices to run Adobe Flash, which was at that time, the de facto authoring software for e-learning content development, deprived e-learning courses of complex animations and rich graphics which Adobe Flash was known to produce (Prasad, 2013).

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- c) Bhamidi (2012) classified these barriers into four categories – *pedagogical* that includes cognitive elements of learning theories, *social* that includes the social elements of learning theories, *design* that includes the processes of designing content or instructions, and *technical* that includes issues such as network connectivity and input capacity.
- d) There were other challenges such as modifying mobile learning to match the expectations, attitudes and satisfaction of users, especially those over 55 years of age (Song & Erdem, 2011); ergonomic limitations of mobile devices and security concerns, especially in public places (Sacco, Reinhard, Barbosa, & Schlemmer, 2010); and the current level of mobile and wireless technologies that may sap the motivation of learners resulting in dropouts among the corporate workforce (Sacco et al., 2010).

However, in the present day, most of these challenges have been successfully resolved with advances in mobile and learning technologies and the increased comfort level of people using mobile devices (Panigrahi, Srivastava, & Sharma, 2018).

2.3.4 Effectiveness of Mobile Learning

There has not been much systematic research done on mobile learning in corporate organisations, especially on measuring its effectiveness. Generally, corporate training is based more on content than on social interaction (Kukulska-Hulme & Traxler, 2005, p. 39). However, the latest understanding of mobile learning as a phenomenon is that it is, among other things, social in nature. So, it is interesting to observe if mobile learning will bring a social aspect into corporate training, specially e-learning, which is essentially self-paced individual learning.

With jobs becoming more and more mobile (Mulholland, Ivergard, & Kirk, 2005), not just remote project teams (Pimmer & Grööhbiel, 2008) but also other operational jobs including sales jobs, mobile technologies are being increasingly used for educational and training purposes, and not just in the health sector (Luanrattana, Win, & Fulcher, 2007). Corporate training is changing with more prevalence of informal learning and wider acceptance of the 70:20:10 framework of workplace training (Jennings, 2008; Scott & Ferguson, 2014) which holds that employees gain 70 percent of their knowledge on-the-job, 20 percent from interactions with others, and 10 percent from formal educational events. The 20 percent that employees learn from others through social learning, coaching, mentoring, collaborative learning, and other methods of interaction with peers, offers a promising acceptance and growth of mobile learning.

Is mobile learning effective? The response was positive when a similar question, whether and how mobile devices can support the learning of workforce was posed to 56 international experts (Pimmer & Grööhbiel, 2008). The findings of the survey showed that social interaction and reflection on learning processes received the most positive evaluation as did content-based scenarios with examples focusing on contextualised learning. Integration of learning at work was described as the most important area of inherent tension that must be addressed. Soon, mobile learning in companies is anticipated to primarily form 'just-in-case' learning based on human-computer interactivity. The results were of limited value as the question was how mobile *devices* would help in supporting employee learning rather than how mobile *learning* would help. The experts believed:

- a) 'Just-in-case' learning, essentially performance support using mobile devices appeared to be the most prevailing form of practice. Its benefits are moderate and implementation relatively easy.
- b) The use of 'quiet moments' for learning are not practical.
- c) It is important to personalise the content as well as the learning environment.
- d) Though the contextualisation and integration of learning into work processes is very promising, it is challenging to implement as it requires technical and organisational changes.
- e) Mobile devices will support coordination, coaching, and collaboration, and trainers can therefore enhance continuity of learning.

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- f) Sharing user-generated content requires technical and didactic skills on the part of the learners.

Currently mobile learning in corporate organisations is used along with e-learning and classroom training in a kind of blended fashion. Mobile learning is used mainly to complete a larger e-learning delivered as micro-learning modules via mobile devices or as performance support learning nuggets as 'just-in-time' learning (Traxler, 2007). Collaboration and reflection among trainees and/or trainer have not been observed.

Josie Taylor (Taylor, Sharples, O'Malley, Vavoula, & Waycott, 2006), in an endeavour to evaluate the pedagogical soundness of a mobile learning environment drawing on concepts based on the Activity Theory and the Socio-cognitive Engineering Method (Sharples, 2000), suggested a framework which would capture the user's current and future activities, which in turn would facilitate the understanding of the potential range of actions and opportunities for mobile learners.

Haag (2011) conducted an empirical study to measure the effectiveness of mobile learning as compared to the same content delivered via e-learning. The study showed both qualitative and quantitative results from the data collected from learners, who were defence personnel. 70% of learners were satisfied with the benefits offered by mobile learning such as convenience, time saving, and interactivity, and preferred mobile over e-learning.

However, pre- and post-test analysis showed a modest 8% improvement. One half of the evaluation was at the 'reaction' level of the Kirkpatrick-Phillips framework, and the other at the 'learning' level. Both results could conclusively establish the effectiveness of mobile learning.

Although there are several studies on various aspects of mobile technologies and mobile learning, there are very few in the corporate setting and fewer on the evaluation of the effectiveness of mobile learning.

2.4 Influence of Context on Learning Technology Integration in Corporate Settings

2.4.1 Introduction

This section reviews the research that has been done on the influence of context or environment (external factors) that enable or restrain the integration or adoption of learning technology in corporate settings.

Context may be defined as the environment or setting in which the proposed change is to be implemented (Chin, 1985; Kitson, Harvey, & McCormack, 1998). In a typical corporate organisation, the environment can be seen as existing policies, strategies, procedures, technology, people (their knowledge, skills, and attitudes), culture, and the ability to change. These components interact and change continually in response to the changes in the macro-environment in which it operates (Furxhi, Stillo, & Teneqexhi, 2016).

For this project, technology is confined to 'learning technology' used in corporate settings, which is synonymous with 'educational technology' predominantly used in school or education settings. The Association for Educational Communications and Technology (AECT) defined educational technology as "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" (Seels & Richey, 2012, p. 4). It is also known as 'instructional technology' which was defined by Gagne as the

practical techniques of instructional delivery that aim to improve learning (Gagne, 2013). For the purpose of this study, technology includes LMSs, LCMSs, and digital courseware delivered on computers and laptops (e-learning) or mobile devices (mobile learning). Technology that delivers virtual classroom training is not included as it is essentially online conferencing technology such as WEBEX used primarily to conduct virtual meetings. Also not included in this review is technology used in classrooms such as interactive whiteboards and projectors, which again are used for other purposes too.

Technology integration in corporate training is the use of technology to enhance and support the organisation's overall training and development efforts. As Earle (2002) pointed out, technology refers to tools that improve content delivery and implementation. While technology is a key factor, content and effective instructional practice are important too. To quote Earle, "Integration is defined not by the amount or type of technology used, but by how and why it is used". In other words, it is the incorporation of technological resources and practices in the processes, procedures, and functioning of corporate training and development (Forum on Education Statistics, 2002). Technology resources can be computers, laptops or mobile devices, specialised software platforms such as LMS/LCMS, network communication systems such as LAN/WAN/Intranet/Internet, and other equipment.

Successful technology integration is said to have occurred when the said technology is fully used by the stakeholders, training managers, and staff to support and achieve organisational goals. Technology integration is an ongoing process as technologies, users, and goals keep changing.

2.4.2 Factors of Influence

There are a host of studies on the topic of enabling and restraining factors of technology enhanced learning in corporate organisations and institutes of higher education.

Among the positive influencers or enabling factors are some obvious ones such as cost savings in terms of production of training materials, maintenance of courses, and mainly, travel for participants. In addition, there are other benefits such as convenience of 24/7 access, standardised delivery, self-paced learning, the variety of content available (Strother, 2002), and all other advantages and benefits attributed to e-learning and mobile learning (Kanuka, 2008). The main driving forces discovered during my previous research (Prasad, 2013) were saving costs, improving revenues, complying with legal requirements – essentially reasons for any business enterprise to survive and thrive in a dynamic business environment. The triggers may be, for instance, a mandatory compliance training that needs to be completed by hundreds of thousands of geographically spread employees in a short time; or an urgent competitive need to improve the efficiency and effectiveness of its sales force; or a cost-cutting initiative in manufacturing that demands training of shop floor

workers (Prasad, 2012). These findings agree with Strother's (Strother, 2002) findings that business enterprises see enormous economic benefits in e-learning (and now mobile learning), making it a big favourite in many companies. Technology innovation figures among the three main drivers of e-learning, the other two being organisational and business development, and individual learning needs (Eklund, Kay, & Lynch, 2003).

When it comes to hurdles or restraining factors, there are many. Mungania lists seven of them – personal or dispositional, learning style, instructional, situational, organisational, content suitability, and technological barriers (Mungania, 2003). Situational barriers were the most prevalent, while personal barriers the least common. Medárová et al. (2012) categorised them into conceptual, organisational, technical, and human. Raymond et al. (2012) viewed them under three headings – *Technology-related factors* (IT assets, e-learning technology complexity, and e-learning costs), *organisation-related factors* (technological opportunism, technological orientation, organisational innovativeness, technology portfolio and absorptive capacity, top-management support, organisational culture, and the characteristics of IT professionals) and finally, *environment-related factors* (external or environmental pressures). There was considerable variation in the human factors with attitudes ranging from enthusiastic acceptance to stubborn resistance but they eventually turned out to be insignificant barriers where the adoption of e-learning was concerned (Mungania, 2003). Money was not a constraint provided the stakeholders were convinced on its utility. Prioritising budgets for e-learning has always been a tug-of-war between stakeholders

and proponents, with both parties having to fight for their share of budgets. Technological barriers such as the quality of the LMS, connectivity problems, navigation problems, limitations of technical support, loss of data, inability to save or transfer data, and information security issues were stated as one of the top sets of barriers in e-learning adoption (Mungania, 2003).

A study (Rabak & Cleveland-Innes, 2006) on what influences employee acceptance or resistance to e-learning in a large retail chain found that the positive influencers were the reasons for the training being well understood, in other words, the training addressed a felt need. The main demotivator was insufficient time to complete training. The study also found that adequate time, meaningful recognition for participation, and personal and technical support were viewed necessary for successful implementation of e-learning.

Alrasheedi & Capretz (2018) did a systematic analysis of several studies conducted on mobile learning to assess the critical success factors and found that collaboration during studies, ubiquitous learning in space and time, and user-friendly application design were believed to be important. At the organisational level, employee development, training culture, and alignment with corporate strategy were the influencers. At the individual level, perceived usefulness, ease of operation, and computer anxiety came up as considerations.

2.4.3 A Conceptual Framework of Barriers

There are many barriers that were discovered while implementing e-learning. Ali et al. (2018) came up with the most comprehensive list of 68 unique barriers that were thematically grouped into four conceptual categories – Technology (T), Individual (I), Pedagogy (P) and Enabling Conditions (EC). The TIPEC framework contains an in-depth qualitative review of e-learning literature (259 articles) from 1990 to 2016 from multiple learning domains (higher education, vocational training, and corporate training). It is intended to help stakeholders identify and manage barriers specific to them.

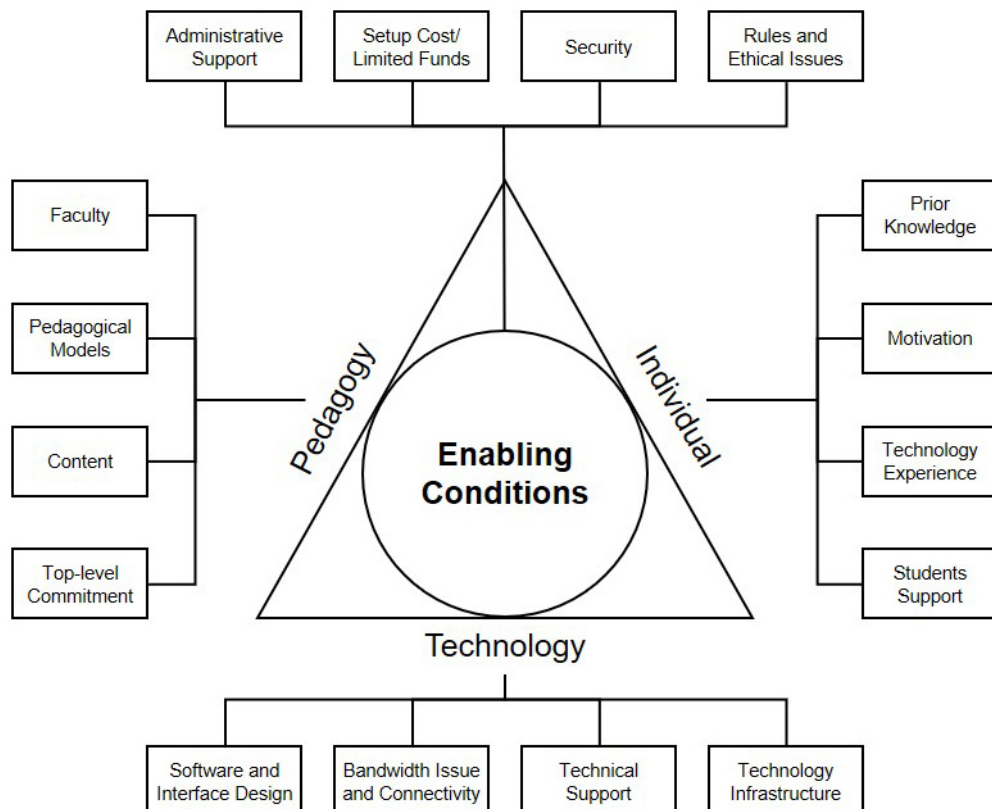


Figure 2.5 TIPEC framework structuring technological, individual, pedagogical barriers and enabling conditions (Ali et al., 2018)

2.4.4 A Conceptual Framework of Adoption and Assimilation

The framework for adoption and assimilation of Raymond et al. (2012) integrates the three categories of factors that impact the adoption and assimilation – technological, organisational, and environmental – that are considered antecedents of e-learning adoption and assimilation and are recommended for small and medium sized enterprises but can also be used in large organisations.

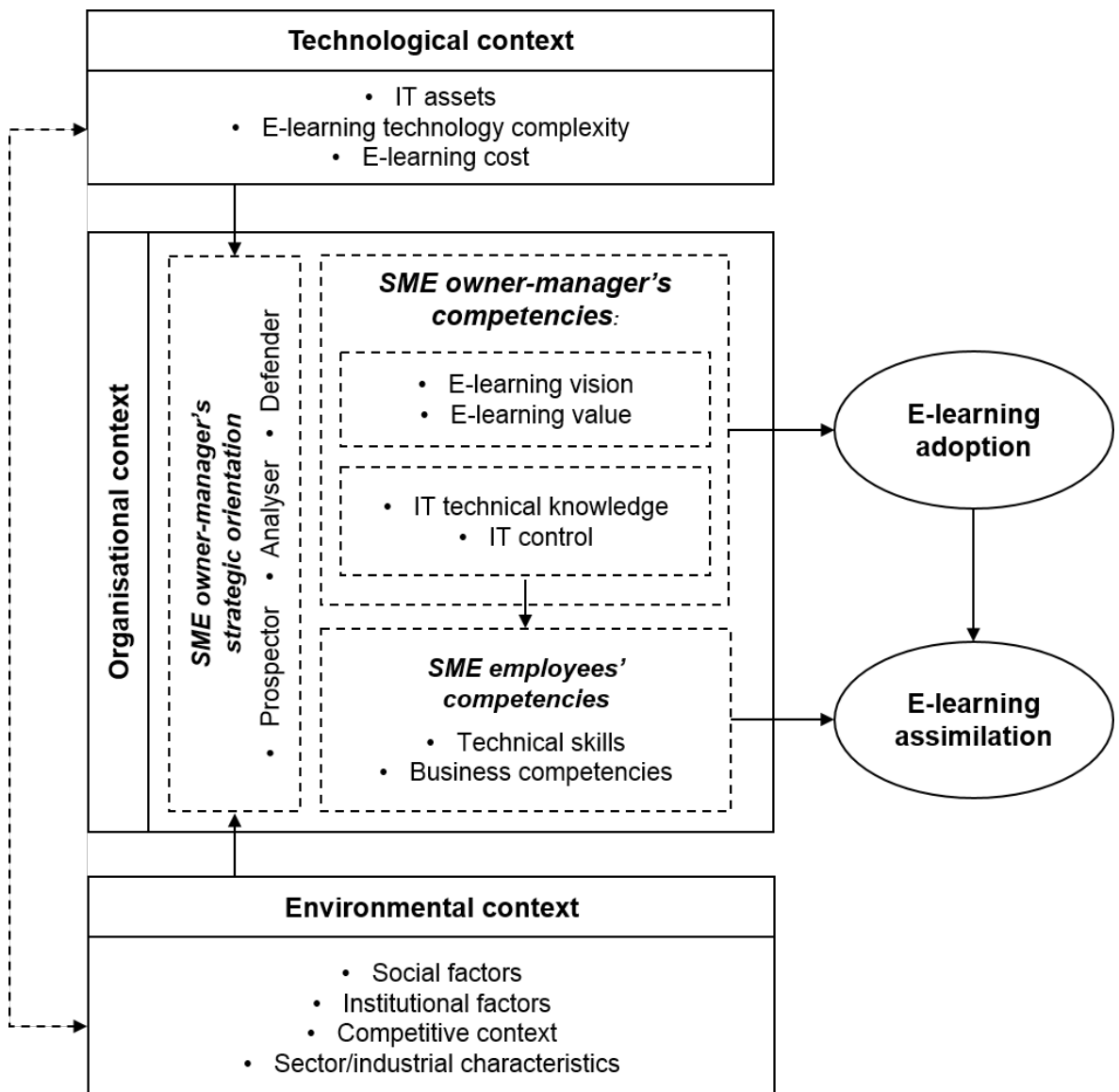


Figure 2.6 E-learning adoption and assimilation framework for SMEs
(Raymond et al., 2012)

According to the authors, the most influential among all organisational factors is the managerial outlook and characteristics of the top managers as the organisational outcomes and processes are directly impacted by strategy. For example, if the top management is of the 'prospector' type, constantly scouting for opportunities for growth and improvement, it can be expected that e-learning and its related initiatives would get a fillip as against a 'defender' type who will be less open to such initiatives. The top management's outlook will also depend on various micro- and macro-economic and social factors in addition to their own psychological makeup.

Notwithstanding the above discussion on the driving and restraining forces as experienced by the stakeholders in adopting e-learning in their organisations, it was clear that the driving forces were far greater than the restraining forces over the years, which led to the positive change as far as e-learning adoption was concerned (Burnes, 2004).

2.5 Summary and Gaps in Literature

2.5.1 E-learning – Literature Review and Gaps in Research

Although there is a fair amount of clarity on what e-learning means due to the availability of numerous definitions of e-learning, there is no one comprehensive definition of e-learning in the corporate context. Considered as a single term, it opens itself to multiple definitions, each touching upon a single feature, deemed important and relevant enough to figure in the definition.

- a) It was clear from the definitions that e-learning cannot be explained in terms of its features or usage, but rather as an ecosystem of learning with three principal dimensions – users, technology, and services.
- b) An attempt has been made to provide a definition that covers the concept holistically and in the corporate setting, covering technology, pedagogy, and people using it, along with their interrelations.
- c) There is ample research demonstrating the advantages of e-learning in improving the knowledge, skills, and attitudes of the workforce in various industry verticals, business functions, categories of staff, and subjects taught across the world.
- d) There is also research that revealed its shortcomings and misconceptions. However, research has also amply demonstrated that the advantages

have far outstripped the drawbacks, showing an impressive rate of acceptance of e-learning in corporate training functions.

- e) The attitudes and perceptions of the corporate stakeholders towards e-learning has been substantially positive, with most of them seeing e-learning as a cost effective, efficient, and easy to administer method of training that complements classroom training (ILT) and achieves its training objectives in different scenarios and audiences.
- f) The corporate understanding of the relationship of e-learning with mobile learning still shows an outdated version that mobile learning is an extension of e-learning. There is no evidence that mobile learning is considered a new paradigm in human learning.

2.5.2 Mobile-Learning – Summary of Literature Review and Gaps in Research

- a) Like with e-learning, there have been myriad definitions over the decade with none doing justice to the concept of mobile learning.
- b) The exception were Sharples, Traxler, Kukulska-Hulme, Vavoula and Taylor, who observed that what defines mobile learning is the mobility of learner and not that of the device. Also, their contribution that identified 'conversation' as the unit of mobile learning places mobile learning in a whole new light.

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- c) An attempt has been made to come up with a comprehensive definition, more so for the corporate sector, that covers all its aspects – learners, learning content, learning devices, aspects of mobility, and the uniqueness of truly anywhere, anytime learning that is just-in-time, just-enough, and just-for-me.
 - d) There is ample research demonstrating the benefits and advantages of mobile learning, although not so much in the corporate sector. However, most of these studies followed surveys and Delphi methods to arrive at the results.
 - e) There is also ample evidence that mobile learning has a long list of challenges – technological, pedagogical, psychological, and social. However, there is also evidence that mobile learning is making inroads into the corporate training arena, slowly (at about 2% of learning hours), but with the promise of wider acceptance.
 - f) There is research that shows that most of the challenges faced by mobile learning ten years ago, such as technological limitations of mobile devices and resistance from stakeholders, have reduced, at least to some extent.
 - g) There have been several large implementation projects in mobile learning across the world for the last ten years, but none talk deeply about the measurement of the effectiveness of mobile learning.
 - h) There is very little evidence that studies were conducted to evaluate the effectiveness of mobile learning.

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- i) As mentioned earlier, the corporate sector lags way behind in evaluating training beyond the basic levels of reaction and learning, even for classroom training and e-learning. Evaluating the effectiveness of mobile learning is at a very nascent stage.

2.5.3 Influence of Context on Technology Integration in Corporate Settings and Gaps in Research

- a) For the purpose of reviewing the literature under this section, the following assumptions have been made:
- The definition of 'context' has been taken as the environment or setting in which the proposed change is to be implemented, the change here being the introduction of new technology.
 - Technology has been restricted to learning technology comprising e-learning, mobile learning, digital performance support, and LMS/LCMS.
 - Integration has been viewed as the assimilation and use of new technology into the existing technology, used freely by the stakeholders.
- b) There is ample research to demonstrate that context hinders or promotes the integration of learning technology in corporate organisations. Most of this research is confined to e-learning with not much on mobile learning.

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- c) There are several comprehensive research-based models of e-learning barriers. It can be assumed that most of the barriers in the implementation of e-learning may also play a role in that of mobile learning and thus were considered for this project.
 - d) There are also some useful models that facilitate the understanding of the process of adoption and assimilation of e-learning which may be considered for mobile learning too.

The gaps in the literature thus far reviewed were:

- a) Relationship between e-learning and mobile learning
- b) Deeper understanding of mobile learning as a new paradigm of learning
- c) Evaluating the effectiveness of mobile learning
- d) The influence of millennial workforce on the adoption of mobile learning

It is clear from the above that the outcome of my research will address some of these gaps in a meaningful way.

3 Theoretical Framework

3.1 Introduction

This research is based on a theoretical framework, which is used as a structure that supports and forms a frame of reference for the research study.

My choice of the theoretical framework was influenced by my having conducted the literature review on various theoretical bases for mobile learning and identifying which of them could satisfactorily explain mobile learning and the different components that made up and influenced the mobile learning ecosystem.

The framework is a collection of interrelated concepts that has been used in prior work. It is used to explain “the rationale behind choosing mobile learning as a research problem” (Abend, 2008; Swanson & Chermack, 2013), and help determine the focus of the investigation and the inter-relations that should be looked into (Borgatti, 1996).

More specifically, the framework strengthened the study in the following manner (USC Libraries, 2016):

- a) Providing an explicit statement of the initial assumptions on mobile learning, thereby helping in their critical evaluation
- b) Connecting current research to the existing knowledge, providing an initial frame of reference

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- c) Informing the choice of research methods

 - d) Providing a starting point for analysing the key variables that might influence the said phenomenon, the need to examine those variables, and how they relate to one another under various circumstances

3.2 My Worldview: Social Constructivist

My worldview as a social constructivist was shaped by my academic background in life sciences, professional experience in business management and entrepreneurship, and my stock-in-trade corporate training. I believe that social constructivists try to find subjective meaning in their experiences. As these experiences are varied and multiple, they look for complexity of views rather than a narrow meaning in a few ideas. When I was working as a sales professional, I experienced failure more often than success in terms of selling products and services. Regularly experiencing failure helped me realise that success is not final, and failure is not fatal. My stance was further refined by my experiences as a training and e-learning professional, the details of which I mentioned in *Chapter 1*, and amplified by my reflections and experiences during the doctoral programme. Another significant contribution to my worldview was my knowledge of the history of my various clients when it came to corporate training in their specific organisational setting, and the context in which they work and adopt these training initiatives.

My worldview, which included my epistemological and ontological position, helped me choose a suitable theoretical framework for my study. Naturally, I was inclined towards social constructivist learning theories (Pritchard, 2017, pp. 24-25) rather than to approaches such as behaviourism, (Pritchard, 2017, pp. 5-6) where learners are not viewed as active creators of knowledge or interpreters of meaning, and where learning is viewed as changes in individuals' observable behaviours, ignoring their internal cognitive processes or theories that focussed entirely on internal mental processes to the exclusion of other aspects of learning. My worldview had led me to believe that learning is not a mechanical process of acquiring knowledge but an active, contextualised process of constructing knowledge to arrive at meaning (which is shaped by one's personal experiences, social interaction and negotiation with others and the environment) (Anderson, 2016, p. 38). So, it was natural for me to choose a suitable theoretical framework that was aligned most closely with my socio-constructivist worldview and also, in my context of mobile learning, accommodated the technology mediated aspect of learning that makes mobile learning possible. (See *section 3.3: Theoretical Basis for Mobile Learning* for details.)

My worldview also helped me select an appropriate research methodology to collect data and a comprehensive frame of reference for presenting and analysing my final findings and presenting my conclusions. My objective was to construct the meaning of a situation based primarily on the views of the participants, keeping their contexts of life and work, as well as historical and cultural setting in mind (Creswell, 2009).

3.2.1 Social Constructivism in a Learning Context

As a social constructivist, I believe that individuals strive to understand the world they live and work in. Gergen says, “Social constructionism views discourse about the world not as a reflection or map of the world but as an artefact of communal interchange” (Gergen, 1985). We (as a society) construct an idea that may be obvious to us, but which may or may not be real. In other words, the idea is an ‘artefact’ of a given society. We learn and build our understanding of the world by reflecting on our experiences. For example, my ‘artefact’ of entrepreneurship grew and evolved from when the idea came to my mind three decades ago to the present day. Even after two decades of building a business, the idea continues to evolve and refine itself in my mind because of my constant reflection and interaction with society.

3.2.2 Learning as a Collaborative Effort

The collaborative effort of knowledge construction generates new perspectives usually exceeding that of the individual (Davey, 2015). For a social constructivist, learning is an active mental process that creates meaning out of sensory inputs. As I learn, I also learn how to learn better. Language is the medium of learning as people talk to themselves as they learn. It is also important to note that learning does not happen in isolation but takes place during social interactions with other people (Vygotsky, 1978). It is highly contextual, not happening in disparate pieces but as a piece of thread that weaves itself into the already woven fabric of knowledge, beliefs, experiences, and emotions of the learner.

I have learnt that learning takes time to solidify, as the new knowledge percolates down (Hein, 1991) through already existing knowledge. For example, in a corporate training perspective, I observed that learning as a collaborative effort is best seen in mentoring and coaching sessions between trainees and managers, and among groups of trainees during their initial induction or onboarding. After this initial phase, they learn to 'learn faster' and 'learn most' interacting with colleagues, customers, and competitors. In other words, how we engage with others influences the mental models we use to understand the world. Corporate training provides one example of an attempt to structure such engagement and influence the mental models of employees.

3.3 Theoretical Basis for Mobile Learning

As I mentioned in *Chapter 1 (Introduction)*, my experience in e-learning and mobile learning is wide and varied, as my organisation has been designing and developing e-learning and mobile learning for large multinational business firms across the world. Most of the organisations that I dealt with are still discussing the idea of mobile learning with a few running pilot projects to evaluate its suitability and effectiveness. Some of the companies are using mobile learning to deploy micro-learning modules for just-in-time learning. Very few of them have experienced the full extent of mobile learning as a new way of learning, and not just as an extension of e-learning.

I wanted to cross-check my observations with the academic research on what has been postulated for mobile learning. During my research, I found a number of possible theoretical bases for mobile learning (ones that current mobile learning theories make use of) – Behaviourist learning, Cognitivist learning, Constructive learning, Situated learning, Problem-based learning, Context awareness learning, Socio-cultural theory, Collaborative learning, and Conversational learning (Keskin, 2011) – clearly, different learning theories address different aspects of learning, and each serves a different purpose.

Given that learning implies integration of two very different processes, namely an external interaction process between the learner and his or her social material environment, and an internal psychological process of elaboration and acquisition, and with many learning theories dealing only with one of these processes (Illeris, 2018), it was initially difficult to select my theoretical framework. For instance, traditional Behaviourist and Cognitivist theories focus only on the internal psychological processes, while Social Learning theories, such as situated learning, take social interaction into account, but still from a primarily psychological perspective that was not suitable for my purposes in the present project. However, I found that although Constructivist theories also view learning from a psychological perspective, they focus on the process by which learners build their own mental structures when interacting with an environment (Wenger, 2018, pp. 216-217), and hence were the ones I was drawn to in my context of mobile learning.

Although there are other theories that move away from an exclusively psychological approach, such as Activity, Socialisation, or Organisational

theories (Wenger, 2018, pp. 216-217), for my context of mobile learning, I chose to examine the Cognitivist, Constructive, Situated, Problem-based, and Conversational theories in detail as these were aligned in varying degrees to my socio-constructivist worldview. Also, with mobile learning necessitating the interaction between humans and technology, for my purpose, I was looking for a learning theory that would accommodate the very specific aspect of technology-mediated aspects of learning that made mobile learning possible as well. Of course, it was important for me to understand technology-enhanced learning as a practice-based problem, rather than focusing narrowly on technology (Luckin, Bligh, Manches, Ainsworth, Crook, & Noss, 2012) before I could proceed.

On close examination of all the theories I considered, I found the theory of Conversational learning to be the most comprehensive and relevant because not only did it address my socio-constructivist view, but in the mobile learning context, it also specifically addressed and accommodated the dialectical relationship between learning and technology (Table 3.1).

Conversational learning is defined as learning in terms of conversations between different systems of knowledge, with focus on interaction and communication dependent mobile learning, solving a problem, exploring an environment, and communication between peers via mobile phones.

Examples include laboratory classes, field trips, mobile computer-supported collaborative learning, and Interactive Voice Response (IVR).

This theory covers the aspects of humans interacting with other humans, ICT, and mobile technology, which is a part of my definition of mobile learning. It is also in line with my view of learners in mobile learning being connected, interactive, and mobile, and in which the entire ecosystem is mobile, interconnected, and interacting in real-time with one and another.

I carefully analysed the theories I had considered against my experiences with mobile learning, especially in a corporate setting, as suggested by Mike Sharples (Sharples, Taylor, & Vavoula, 2007) based on the following criteria:

- a) Is the theory significantly different from current theories of classroom, workplace, or lifelong learning?
- b) Does the theory account for the mobility of learners?
- c) Does the theory cover both formal and informal learning?
- d) Does the theory postulate learning as a constructive and social process?
- e) Does the theory analyse learning as a personal and situated activity mediated by technology?

This is how the various learning theories I explored measured up against the questions above:

Questions/ Theory	Is it significantly different?	Mobility of learner?	Informal & formal learning?	Constructive and social process?	Personal, situated and technology mediated?
Behaviourist	No. Reinforcement of learning figures in classroom.	Not considered.	No mention of informal/ formal learning.	Doesn't mention the social aspects of learning.	No mention of personal, situated or technology mediation.
Cognitivist	No. Talks only about acquisition of, reorganisation of knowledge.	Not considered.	No mention of informal/ formal learning.	Yes, mentions learning as a constructive process.	No mention of personal, situated or technology mediation.
Constructive	No. Talks about construction of new knowledge based on current or past knowledge.	Not considered.	No mention of informal/ formal learning.	Yes, mentions learning as a constructive process.	No mention of personal, situated or technology mediation.
Situated	No. Talks about knowledge acquisition through social participation.	Not considered.	Does not cover formal learning. Social learning incorporates informal learning.	Yes, mentions learning as a social process.	No mention of personal, situated or technology mediation.
Problem-based	No. Talks about development of critical skills for problem-solving.	Not considered.	No mention of informal/ formal learning.	Yes, mentions social aspects of learning.	No mention of personal, situated or technology mediation.
Context Awareness	No. Talks about gathering information from environment.	Not considered.	Does not cover formal learning. Social learning incorporates informal learning.	Doesn't mention the constructive or social aspects of learning.	Yes, mentions context awareness but nothing on personal or technology mediation.
Socio-cultural	No. Talks about learning through interpersonal rather than intrapersonal interactions.	Not considered.	Does not cover formal learning. Social learning incorporates informal learning.	Doesn't mention the constructive or social aspects of learning.	No mention of personal, situated or technology mediation.
Collaborative	No. Talks about learning	Not considered.	No mention of informal/	Doesn't mention the	No mention of personal,

	through collaboration and interaction.		formal learning.	constructive or social aspects of learning.	situated or technology mediation.
Conversational	Yes. Talks about conversations between learners and systems.	Yes. Mobility of learners is considered.	Yes. It covers both formal and informal learning.	Yes, mentions constructive and social aspects of learning.	Yes, addresses personal and situated aspects and technology mediation.

Table 3.1 Learning Theories against selected criteria (adapted from Keskin, 2011)

I found that most of the above theories confined themselves to limited dimensions of mobile learning while ignoring the rest. Only a couple of them took a more holistic view of mobile learning of which, the conversational theory appears to fulfil all the criteria. I finally decided that the most suitable theory to be used as the theoretical framework for this research was Mike Sharples' Theory on Mobile Learning, based in part on the Conversation Theory.

3.3.1 Mike Sharples' Theory on Mobile Learning

While most learning theories centre around classroom learning mediated by a teacher, there are none that focus on the mobility of learners (learner being mobile when accessing learning, such as when travelling outside their workplace) and learning (knowledge or content). To this end, Sharples and others felt the need to put forth a theory that would encompass both learning supported by mobile devices as well as the mobility of learners and knowledge (Sharples et al., 2007). This has been articulated by others subsequently, with an emphasis on mobility of technology, learners, and learning (learning content or knowledge), using similar or comparable terms.

Mobile learning is defined as “any type of learning that takes place in learning environments and spaces that take account of the mobility of technology, mobility of learners and mobility of learning”(El-Hussein & Cronje, 2010).

The mobility of learners is a significant aspect, and in my research, the mobility of the sales and service staff is the most important issue, and one of the reasons why, as I mentioned earlier, I chose this group. An interesting aspect of this mobility is that mobile learning was extrapolated to include even accessing content through a computer, as long as it was not being done from the office (probably at an internet café). In such an instance, the mobility of technology (the device) seems to assume less importance than the mobility of the learners themselves, although the mobility of training managers in my case, is not assumed. When it comes to the mobility of technology, while Sharples primarily refers to the use of mobile devices and internet technologies, one can access mobile learning content even from an internet café on a desktop, and so mobility of technology is not fundamental to my project, although it is a significant aspect of mobile learning. The mobility of content in my context refers to the content being located on cloud-based servers, which makes the content not bound to any device or location, but which allows learners to access it anywhere through mobile technologies. On careful consideration of all these issues, I wanted to have a theoretical framework that would address or bring together all these aspects of mobile learning that I had been thinking through and I found it in Sharples', who went a few steps further and talked about seamless integration and communication between the various components as explained below.

The different components of Sharples' mobile ecosystem are envisaged to 'converse' among themselves, through which learning takes place. Sharples' theory illustrates the convergence of mobile technologies and the new trend of personally managed lifelong learning activity.

New Learning	New Technology
Personalised	Personal
Learner-centred	User-centred
Situated	Mobile
Collaborative	Networked
Ubiquitous	Ubiquitous
Lifelong	Durable

*Table 3.2 Convergence of Learning and Technology
(Sharples et al., 2007, pp. 222-226)*

It defines mobile learning as "the process of coming to know through conversations across multiple contexts amongst people and personal interactive technologies" (Sharples et al., 2007, p. 225). The focus of the theory is neither the learner nor the technology but communication between both. The theory explores the system of learning enabled by mobility of people and technology.

On further analysis, it was clear that 'Learning as a Conversation' comes closest to explaining mobile learning. Mike Sharples' theory brings together all the elements of mobile learning – learners, knowledge, mobile and fixed devices on one hand, and the mobility of learners and knowledge on the other (Sharples et al., 2007, p. 224). His theory appeared to be the most comprehensive and therefore, I selected it as the framework for my project to analyse mobile learning in corporate organisations.

3.3.2 Reasons for Selecting Mike Sharples' Framework

The theory, while including crucial aspects of mobile learning in terms of behaviouristic, cognitivist, constructive, social, situated, contextual, and collaborative learning, also addresses defining aspects of mobile learning such as mobility of learners, informal learning, and technology mediation in the process or system. More importantly, the framework uses 'conversations' between learners and between learners and different knowledge systems, as a unit of learning describing the full extent of mobile learning and defining it as learning that is different from the earlier ones.

When examined against the earlier questions, it was seen that Sharples' conceptual framework addresses the questions adequately (Sharples, Taylor, & Vavoula, 2006, pp. 221-247).

- a) Is Sharples' theory significantly different from the current theories of classrooms, workplace, or lifelong learning?

Sharples' theory highlights the essential difference by assuming that learners are always mobile, moving across different locations and applying and modifying learning gained in one location to another. It allows the learner to revisit knowledge gained in the past, thereby setting a framework for lifetime learning. Most of this knowledge is permanently available in a digital form on a technology knowledge platform to be accessed by learners any time. It considers the possibility of the learner moving from one topic to another across a wide range of learning projects,

instead of holding on to a single subject. Finally, it takes into consideration the learner's engagement and disengagement with technology as he/she enters or leaves areas with different types and levels of mobile connectivity.

The theory does not claim to be totally disparate from other learning theories, as some do include variations of informality, mobility, variety of topics, and lifelong learning. But it is sufficiently different in that it facilitates understanding of how knowledge, contexts, transitions, and technologies come together to make mobile learning a unique and novel approach to learning. One distinction that will be important for the present project is where today's learners are trying to squeeze tiny 'nuggets' of learning into the gaps of their everyday lives (Sharples et al., 2006).

- b) Does Sharples' theory account for the mobility of the learners? Does it cover both formal and informal learning?

The theory postulates that much of learning happens outside conventional places of learning such as training halls and classrooms. The theory was heavily influenced by the Vavoula's MOBIlearn project (2005) that found that most of the learning took place outside the learner's usual environment. Learning was found to occur outside the office, outdoors, at a friend's house, places of leisure, places of worship, doctor's chambers, cafes, hobby stores, and cars. Vavoula's (Sharples et al., 2007) research also showed that people created different settings with or without technology and with or without resources. The theory points out how

people creatively use their surroundings to make them 'sites of learning' (Sharples et al., 2007).

- c) Does Sharples' theory postulate learning as a constructive and social process?

Based on Sharples' framework and the social and constructive aspects of learning, the National Research Council (2000) conducted a study on educational effectiveness across ages and subject areas. According to the study, for learning to be effective, it should be centred around:

- **Learner:** The skills and knowledge of learners, allowing them to use their own experience in the process.
- **Knowledge:** Validated knowledge taught engagingly and innovatively. For example, product knowledge delivered to sales and service personnel through multiple teaching methodologies (classroom, e-learning and mobile learning).
- **Evaluation and Feedback:** Knowledge tests and feedback on learner performance to ensure that learning is effectively completed.
- **Collaboration Platform:** A facility for the community of learners to share their knowledge with others or get answers for their questions (Sharples et al., 2006, pp. 222-226).

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- d) Does Sharples' theory analyse learning as a personal and situated activity mediated by technology?

The theory assumes the ubiquitous use of personal and shared technology by the learner. It can be seen that mobile learning can be very informal, personalised, and situated (Traxler, 2007), and that mobile technologies enhance functionalities to deliver learning that would not be possible through conventional e-learning. According to this theory, mobile learning provides freedom to learners to set learning goals and to satisfy them, based on their needs or problems:

“The goals could arise from an external stimulus such as a curriculum or simply from curiosity or serendipity. This further encourages mobile learners to form new goals and attempt to address them through formal or informal study. The theory states that the situation or context is another aspect of mobile learning that is constructed in a dynamic fashion by learners themselves as they move physically from one place to another, interacting with their environment, other learners, and technology”(Sharples, Taylor, & Vavoula, 2005).

3.3.3 Underlying Principles

The theory is based around three cross-cutting principles – learning as a conversation, context and learning, and the dialectical relationship between learning and technology.

3.3.3.1 Learning as a Conversation

Sharples and others claim that the crucial element in the learning process is ‘conversation’. Learners understand each other, and negotiate and stabilise the interpretations of what they learn through conversations (Sharples et al., 2006, p. 225). They based their definition of learning in terms of ‘conversations’ on Gordon Pask’s work (Pask, 1975) on Cybernetics. Pask described communication not as a mere exchange of messages through non-participative media but as a dynamic sharing of understanding within an active and responsive system. Thus, conversation is the ‘currency’ of learning. It drives learning and provides a means for learners to negotiate differences, understand each other’s experiences, and form stable interpretations of the world, though for short periods of time.

In the corporate context, this principle can be seen best when a learner poses a query to another learner or the subject matter expert via a mobile device, or when a learner responds to a colleague’s query posted on an online bulletin board or discussion forum via a mobile device.

3.3.3.2 Context and Learning

Learning always takes place in a certain context (Sharples et al., 2006, p. 229). There are two types of contexts (Cole, 1998) – ‘that which surrounds’ and ‘that which weaves together’.

The context that ‘surrounds’ can be best seen in the traditional classroom where it is seemingly stable (classroom, single teacher, agreed curriculum). In the corporate training context, a trainer/SME prepares the training content based on the training needs and profile of his trainees. The learner, task, and concept form the core of the process, with the department within the organisation, the organisation itself, and the industry needs form the contexts that surround and influence this core. All the surrounding factors influence the training process (albeit at varying levels), not in a linear fashion, but as a complex temporal interdependence between them.

The context that ‘weaves’ can be best seen in mobile learning where the context continually plays like a movie, with the current context being a progression from earlier ones, and the entire movie being a resource for learning. The players, as they ‘converse’ and ‘create mutual understanding’ of their learning, construct this movie. These numerous transient instances are part of the single learning process but there is no clear-cut boundary between the learning action and context.

This principle appealed to me because in the corporate context of mobile learning, especially if the learner is a salesperson in the field, learning is dynamic with learners interacting with a customer or competitor. Most times, the learning starts with one topic and ends at a totally different topic.

3.3.3.3 The Dialectical Relationship between Learning and Technology

Sharples' theory considers the relationship between learning and technology, specifically the role of computers and related equipment, basing its rationale on the study conducted by Vavoula and Sharples (2002). The study revealed that more than half of everyday learning included some technological gadget – mobile and fixed phones, laptop and desktop computers, televisions, and video recorders. Therefore, while not insisting that the device at hand should always be portable, the theory considers the mobility of the learner and the mobility of the knowledge that is transferred. It embraces both learning with portable technology and learning characterised by mobility of people and knowledge (Sharples et al., 2006, p. 231). The dialectical relationship among the learners, learning, and technology is explained by Sharples et al. (2007) in terms of a learning 'conversation'.

In the corporate context, this kind of interaction between the learner, his learning, and technology is best seen in sales and service personnel. As they travel through different physical locations – train/bus stations, airports, hotels, customer workplaces – they constantly interact with different technologies and through different devices to learn and share knowledge and skills with others.

3.4 A Framework for Analysing Mobile Learning

This project will use Sharples' Framework of Mobile Learning.

This framework is adapted from Gordon Pask's Conversation Theory (CT) (Scott, 2001) and Engeström's Activity System Model (1987). A quick look at the latter will help us understand Sharples' framework better because he uses it as a base for building his framework for mobile learning. Engeström's Activity System Model describes a system of activity amongst interacting actors, showing the structural properties of the system, as displayed in Figure 3.1.

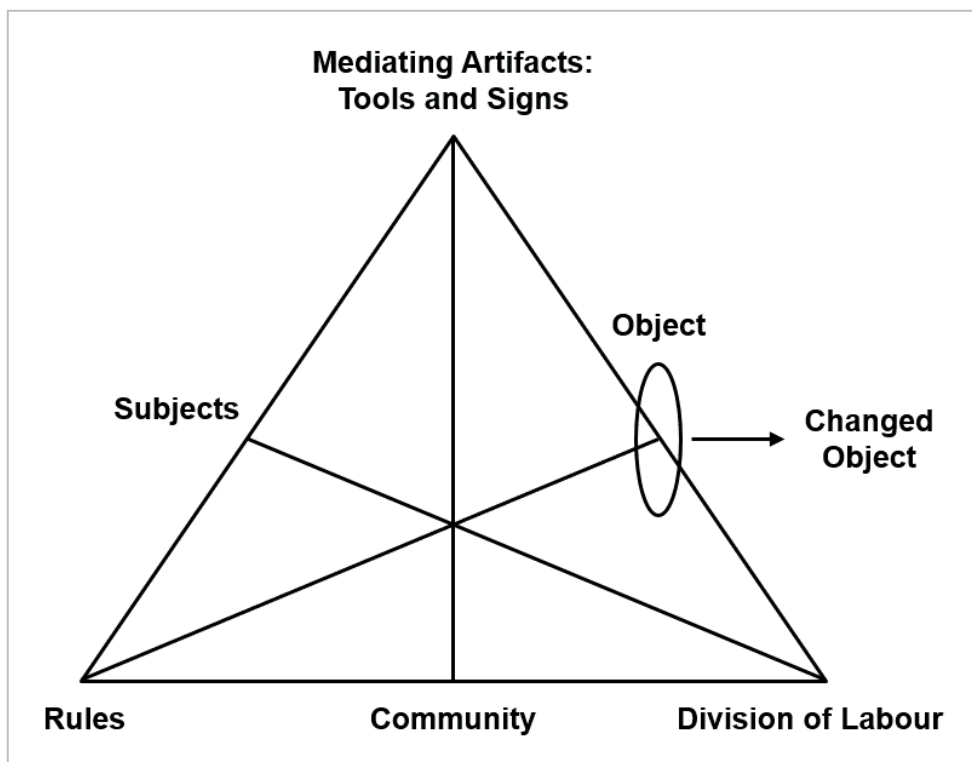


Figure 3.1 Engeström's Activity System Model

Sharples, Taylor, and Vavoula (2007) specifically acknowledge that Engeström's model underpins their work, and offer their own explanation of that underpinning model as follows:

“In [Engestrom's] model, the subject is the focus of analysis (applied to learning systems, the subject is typically a learner). The object refers to the material or problem at which the activity is directed. This is shaped and transformed into outcomes through physical and symbolic, external and internal mediating instruments, including both tools and signs. The community comprises multiple individuals and/or sub-groups who share the same general object and who construct themselves as distinct from other communities. The division of labour refers to both the horizontal division of tasks between the members of the community and to the vertical division of power and status. Finally, the rules refer to the explicit and implicit regulations, norms and conventions that constrain actions and interactions within the activity system.

Following Engeström, we analyse learning as a cultural-historical activity system, mediated by tools that both constrain and support the learners in their goals of transforming their knowledge and skills.

However, to explain the role of technology in learning we separate two perspectives, or layers, of tool-mediated activity” (Sharples et al., 2007, pp. 232-233).

Sharples' framework shows the interacting actors, forces, and systems with the focus on the 'subject' or learner. The 'object' is the learning material or topic. The components 'tools and signs' shape the outcomes while the 'community' is made up of a wide group of individuals who contribute in some way to the learning. This division of labour is shown on both the axes, where the horizontal axis refers to division of tasks among members of the community and the vertical axis refers to power and status.

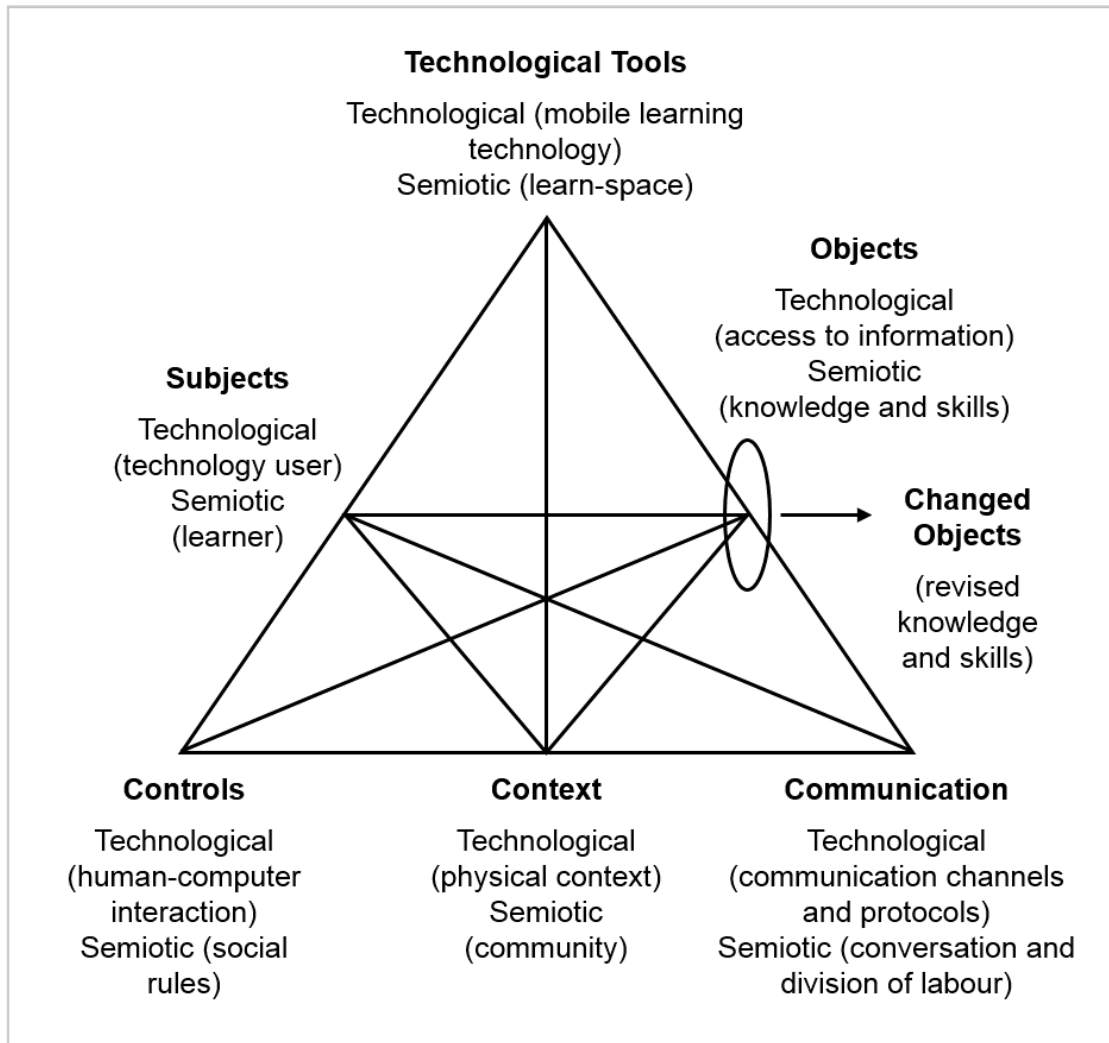
Finally, the rules refer to the code of conduct or norms for actions and interactions among the players. Because Engeström's Activity System model uses terminology drawn from a Marxist lexicon of cultural-historical materialism, Sharples has renamed the cultural factors in the Engeström framework (Engeström, 1999) with 'Control', 'Context', and 'Communication' so that the terminology could be used both by learning theorists and technology designers.

The differences in the two models (such as changes to the concepts of "rules") arise from their attempt to separate the two layers of tool-mediated activity. I will be explaining the new components of Sharples' framework in *section 3.4.1*.

3.4.1 Components of the Framework

Based on Engestrom's precept that learning occurs in a cultural-historical activity system with various tools, both constraining and supporting learners in their quest for acquiring knowledge and skills, the model accommodates learning and the role of technology through two layers – a *semiotic layer* that describes the learning process and a *technological layer* that shows learning as an engagement of technology. These two layers attempt to capture the dialectical relationship between learning and technology in the analytical framework.

The framework describes the process of learning as a cultural-historical activity mediated by technology tools which may promote or restrain learners in their pursuit of learning. The semiotic layer of the framework contains the learners, their learning activities, and the cultural rules that govern them. The technological layer represents the interaction of the learners with the technological tools that are an integral part of the system. The layers, if superimposed as in the diagram, present a holistic picture of the mobile learning system (Sharples et al., 2005), showing the interrelations and interactions among the components – 'subjects' (learners), 'technological tools' (Computer, ICT, and mobile), and 'objects' (learning material); and 'control' (forces that control learning), 'context' (when and where learning happens) and 'communication' between the various components in the system.



*Figure 3.2 A framework for analysing mobile learning
(Sharpley et al., 2005)*

The semiotic layer contains the learner's activities to acquire knowledge and skills that are mediated or influenced by culture and its signs and symbols. Learners internalise language that is manifested in writing and conversations into private or internal thoughts which then provide them the resources to control and develop future learning. The technological layer contains tools such as computers and mobile devices that function as points of interaction in the process of learning or 'conversations'. These two layers in tandem create

a human-technology system of learning that communicates, mediates, and assists in recall and/or reflection.

These two layers can be viewed and analysed separately – as a semiotic framework that would be understood by and facilitates discussion among educational theorists to analyse mobile learning; and as a technological layer that would provide a framework for software developers and programmers to design and evaluate improved mobile learning systems. Taken as a whole, the layers could be superimposed on each other to present a holistic system of learning with interaction between learners and technology. It is not recommended to separate or combine these layers, but to allow them to function as a dynamic and flexible system that helps continually improve the understanding and enhancement of mobile learning.

The framework is based on the definition that learning is a socio-cultural system with learners collectively interacting within the constraints of cultural and historical boundaries. It takes Engestrom's analysis of the collective activity and expands it to reveal the interaction between tool-mediated activities and the cultural rules, community, and division of labour. Having adopted Engestrom's framework that shows a dialectical relationship between technology and semiotics, the framework further divides cultural rules into control, context, and communication for better explanation and understanding.

The various components of the framework on the current research context are as follows:

- a) **Subjects:** The learners or 'subjects' are people, who are a part of this system, whose role is to learn from interacting with one and another or with the knowledge platforms.
- b) **Objects:** 'Objects' are learning materials/mobile learning programmes, information, knowledge, and skills being sought by the learners. Changed objects are revised objects consumed by the learners. Changed objects could also be learning materials that evolve with interactions with and contributions from learners.
- c) **Technological Tools:** The technological tools include computer technology, information and communication technologies, internet and mobile technologies, learning technology, and mobile devices.
- d) **Control:** The control of learners may rest with one person (teacher) or may be distributed among many learners. In the context of the current project, control usually passes from training managers and learners, or between learners and technology. Learning can also be controlled by technology in case of computer-based training or e-learning. Technology also enables learners to access learning materials or training programmes whenever and wherever convenient. Social rules and accepted norms dictate actions of learners – e-mail etiquette or formats of documents used.

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- e) **Context:** Context is the physical environment where learning takes place (locations) and includes various actors or groups (communities) that interact around a shared object (in this case, learning material or programme). Unlike in a classroom where it is relatively static, the context in mobile learning is dynamic as it changes through continuous interaction between learners and technology. It can be temporarily solidified with ad hoc workplaces, social networks, or a shared understanding among learners, but could never be static for long (Lonsdale, Baber, Sharples, & Arvanitis, 2004).
- f) **Communication:** Communication is the dialectic relationship between and among all the actors in the system and between the semiotic and technology layers. This communication is enabled by technology and tools, with multiple channels that facilitate 'conversations'. The framework recognises that learning in the mobile age centres around the essentiality of communication as a process of bringing about a common understanding of the world, and that communication is the central process of learning through which learners resolve differences and come up with shared experiences. Learning is a continual conversation between and among oneself, others, and the artefacts. Learning not only occurs in a context but also creates context through continual interaction (Sharples, 2005).

3.4.2 How the Framework is Used in this Study

To address my main research question on how training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established, I used Mike Sharples' framework because it ties together important components of mobile learning – learners, knowledge, and mobile and fixed devices, and is the most appropriate to study the highly contextual and collaborative mobile learning in corporate organisations.

The framework also influenced my choice of the case study method as it would enable me to obtain in-depth knowledge about the topic of my research from a select group of individuals and capture their experiences and observations. I conducted three case studies in three corporate organisations, collecting data from training managers and sales and service staff.

I used the framework to formulate questions of the study and mapped them as under:

Research Questions	Heads of Analyses
<p>Question 1: RQ 1.4.1 How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?</p>	<ul style="list-style-type: none"> • Initial experiences of mobile learning if adopted • Kinds of communication and conversations within mobile learning • Contexts in which people use mobile learning
<p>Sub-question 1: RQ 1.4.2.1 How do the training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices?</p>	<ul style="list-style-type: none"> • Kinds of communication and conversations within mobile learning • Contexts in which people use mobile learning
<p>Sub-question 2: 1.4.2.2 What are the perceptions of the training managers and sales and service staff about the reasons for adopting mobile learning?</p>	<ul style="list-style-type: none"> • Perceived change of their knowledge and skills as a result of mobile learning
<p>Sub-question 3: 1.4.2.3 How do corporate training managers perceive the benefits and limitations of mobile learning approaches when used in practice, with different members of sales and service staff, in particular, the 'millennials'?</p>	<ul style="list-style-type: none"> • Issues of human-computer interaction they experience (including rules imposed by the company, device features, and hardware/software problems) • Technological tools people use to access the training
<p>Sub-question 4: 1.4.2.4 Are there any discernible differences in perceptions of mobile learning with different members (training managers and sales and service staff)?</p>	<ul style="list-style-type: none"> • The manner in which training managers and sales and service staff view mobile learning • The way training managers and sales and service staff use mobile learning

Table 3.3 Research Questions and Heads of Analysis

I then used the framework to analyse and present the information.

The main concepts (components) of Figure 3.2 'A framework for analysing mobile learning', are used in later chapters for presenting and analysing the data collected from each organisation.

4 Research Design

4.1 Introduction

This chapter on Research Design details my investigation into mobile learning in the context of corporate training, and how it is perceived by training managers in terms of its definition, effectiveness, and appropriateness. It also discusses how the investigation relates to my epistemological position and explores the possibilities for investigating the issue in the above settings.

As mentioned in the earlier chapters, my initial interest in this topic arose from a desire to discover if mobile learning is effective in corporate training organisations.

Typically, research in this area has been focused on learner satisfaction levels (Pollara & Kee Broussard, 2011) with few studies on mobile learning and its effect on employee performance.

Therefore, my research questions centred on the value of mobile learning as perceived by training managers and staff from the sales and service departments.

To recapitulate, my main research question (RQ 1.4.1) was to understand how training managers and staff from the sales and service departments experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established.

I also decided to address a few related questions about the respondents' (training managers and sales and service staff):

- Perceptions on the relationship between mobile learning and wider e-learning practices (RQ 1.4.2.1)
- Perceptions on the reasons for adopting mobile learning (RQ 1.4.2.2)
- Perceptions on the benefits and limitations of mobile learning when used in practice with different categories of staff (RQ 1.4.2.3)
- Differences in perceptions of mobile learning (RQ 1.4.2.4)

I chose Mike Sharples' theory because it ties together the important components of mobile learning – learners, knowledge, mobile and fixed devices – with the learner (the central player) interacting with content, tools, and community. It also considers the defining aspect of the mobility of learners and knowledge (Sharples et al., 2006, pp. 221-247).

In this chapter, I describe how I have used this theoretical framework to empirically analyse the perceived effectiveness of mobile learning and related topics. I have placed the section of *Research Ethics* towards the end because I wanted the reader to understand my research strategy first and then appreciate the ethical issues that were thrown up and how they were dealt with, rather than furnish an abstract and unrelated set of ethics in the beginning.

The remaining sections in the chapter will contain:

- a) Methodology: An overview of definitions, types, and the methodology that I have chosen
- b) Choosing a Methodology: Why I chose the 'case study' as my methodology and how it connects to my theoretical framework
- c) Applying the Methodology: The research cases I have chosen and why I chose them, including the research participants, sampling strategy, and research methods
- d) Data collection methods: The appropriateness of the research methods used in the study
- e) Data analysis approach: The data analysis process and strategy adopted

4.2 Methodology

4.2.1 Overview

Research design is the 'glue' that holds all the elements in a research project together, and ensures the evidence obtained enables the researcher to answer the research questions as unambiguously as possible (De Vaus, 2001). The selection of my research design was based on the decisions taken in the three elements shown below.

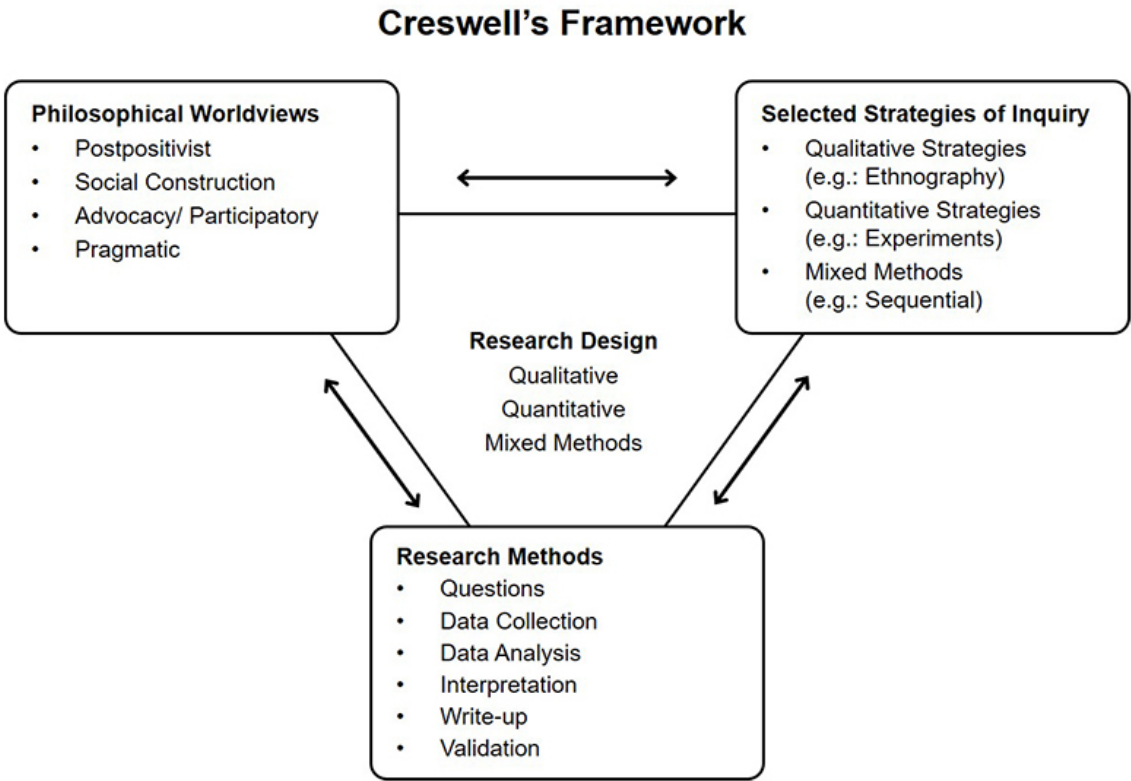


Figure 4.1 A framework for design – the interconnection of worldviews, strategies of inquiry and research methods (Creswell, 2009)

To select the most appropriate methodology for my study, I explored popular academic search engines such as Scopus, Academic Info, Archival Research Catalogue, Eric, and Google Scholar. The case study approach appealed to me as it would help me paint a comprehensive picture of mobile learning in corporate organisations through the views, perceptions, experiences, and ideas of a limited number of stakeholders (Hamilton & Corbett-Whittier, 2011).

4.2.2 Choosing the Methodology

My choice of the case study approach was based on three parameters – my research objectives, my worldview, and the theoretical framework adopted for my study – and the substantial interrelationship and alignment among these parameters.

The choice of a case study approach becomes appropriate (Yin, 2003) when:

- a) Research is focused on finding answers to the 'how' and 'why' questions
- b) It is not possible to manage or manipulate participants' behaviours
- c) The boundaries of the phenomenon and context are unclear
- d) "A case study is a method of learning about a complex instance, based on a comprehensive understanding of that instance obtained through extensive description and analysis of that instance taken as a whole and in its context" (Grosshans & Chelimsky, 1990). Yin (2014) also says, "Case studies are not a method, methodology, or research design", but "a story about something unique, special, or interesting – the stories can be about individuals, organisations, processes, programs, neighbourhoods, institutions, and even events" (Yin, 2014).

My research objectives were to find out how training managers and staff from the sales and service departments experience the adoption of mobile learning in corporate training settings where e-learning is already established, and the

reasons for those perceptions. I also wanted to learn how they perceive the relationship between mobile learning and the wider e-learning practices and the benefits and limitations of mobile learning in practice with different categories of staff. A case study approach is recommended for 'Why' and 'How' questions (Yin, 2003) and my research questions are mainly 'Why' and 'How'. As Yin opines (Yin, 2003), the case study approach is also appropriate when it is not possible to manage or manipulate participants' behaviours and when the boundaries of the phenomenon and context are unclear. My participants are training managers and sales and service staff of large organisations who can neither be 'managed' nor 'manipulated'. In other words, the study did not take place in a controlled environment – the participants are working in a live environment. The phenomenon under study – mobile learning – occurs as an integral part of organisational activities and therefore is difficult to delineate from the much larger pool of other organisational activities. The nature of my research objectives, participants, phenomenon, and the context in which it is occurring suggest the case study a viable methodology.

I agree with Gergen that social constructionism views the world as an artefact of communal interchange instead of a mere map (Gergen, 1985). As a social constructivist, I believe individuals are constantly engaging with and trying to make sense of the world they are in. The individual's perception of what is 'real' enables them to build bricks of understanding on a certain subject matter (Prasad, 2013). The questions I have formulated for my research aim to identify these perceptions of 'reality' vis-à-vis mobile learning and could be

achieved through the epistemological and ontological approach. This choice is also in line with Mike Sharples' theoretical framework to include the critical components of mobile learning – learners, knowledge, and mobile and fixed devices, the 'conversation' within the critical components being the 'currency' of interaction (Sharples et al., 2006).

This agrees with my belief that people learn in the process of talking to themselves, and as such, language is the medium of learning. Learning is often contextual and takes place in a collaborative environment involving a group of people. Studying mobile learning in corporate organisations is highly contextual because it is hard to differentiate the phenomena from the context or the situation. Hence, a case study approach is most suitable for this subject matter.

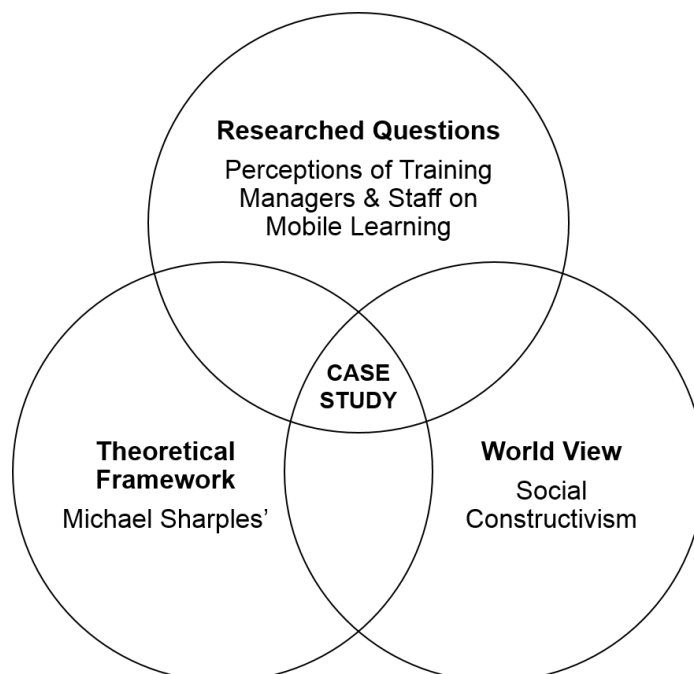


Figure 4.2 Factors influencing choice of Case Study

Coming to the type of case study, I chose to study multiple cases as this would provide the opportunity for me to understand the similarities and differences between the cases, yielding robust and reliable results (Baxter & Jack, 2008). Yin (2003) opines that multiple case studies can be used to predict results, either similar (literal replication) or contrasting (theoretical replication).

My intent was to gain insight into mobile learning in the corporate environment through three case studies in three different corporate organisations.

My reason for selecting three cases was based primarily on the degree of opportunity they would offer me to learn (Stake, 1995). I selected them based on the following criteria (Stake, 2006, p. 23):

- a) Relevance to the quintain (the quintain is something that we want to understand more thoroughly by means of a multi-case study)
- b) Diversity across contexts
- c) Opportunity to learn from the complexity and contexts

Studying multiple cases would allow me to understand mobile learning both within and across units, along with the similarities and differences among the cases (Baxter, Patton, Scott, Degenhardt, & Whiteford, 2013).

Multiple case studies are usually used to achieve more robust results (Yin, 2014).

My choice of selecting these three cases was based on 'literal replication' as I expected similar and predictable results from each one of them (Bengtsson, 1999). It was also influenced by my prior professional relationship with these organisations and the fact that e-learning was already firmly established in them, though they were quite new to mobile learning.

Considering the research objectives, theoretical framework, and my worldview, the case study method seemed the most appropriate to obtain in-depth knowledge from a select group of individuals and capture their experiences and observations.

Though I also considered the Grounded Theory, defined as "the discovery of theory from data systematically obtained from social research" (Glaser & Strauss, 1967, p. 2), I refrained from using it primarily because participants in my research are from diverse groups – in terms of language, hierarchy within the organisation, and geographical location. I chose the case study method as I did not want to limit the parameters of the study and wanted to have a comprehensive picture of the way mobile learning is perceived.

4.2.2.1 Selecting the Organisations

My underlying motivation for this project, as explained in *Chapter 1*, was to understand the emerging uses of mobile learning in large corporate organisations in which e-learning was already well-established. I was not aiming to study corporates only in particular geographic locations or verticals

(i.e., serving different industries), though I was aware that the similarities and differences between different corporates would need to be taken into account when understanding my findings. I therefore chose to select three organisations, each operating in different verticals: an Indian subsidiary of an American multinational organisation in the healthcare industry; a globally leading manufacturer of personal computers, with a base in North America; and a large financial services provider (banking, wealth management, and insurance solutions) based in Australia. Each of those corporates had previously been a client of my own company – a matter I return to discuss later (first in *section 4.6.3* and then in more detail in *section 7.2.3.1*).

Although I did have more than one client in the verticals I mentioned, my final choice was based on two issues. Firstly, the corporate must have an established programme of e-learning provision and have at least some emerging use of mobile learning. Secondly, the corporate must have a large scale of operations – and since multiple options were available, I selected the specific corporate with the largest scale of operations in each vertical. This I felt would give me access to how a truly global organisation viewed and used mobile learning, while at the same time ensuring that no industry-specific or regional-geographic bias crept into the study. At the outset I also anticipated the possibility that some corporates, or key informants, might decline to participate (see *section 4.5 on Research Ethics*), which might cause me to approach alternative organisations, though in practice that did not happen.

4.2.2.2 Selecting the Sales and Services Departments

In *Chapter 1 (section 1.2.1)*, I discussed my reasons for wanting to focus on sales and service staff within corporates, as well as the training managers responsible for providing mobile learning to those staff. Every organisation has different departments to handle its various functions and invests its time and resources to ensure their staff is adequately trained to do their jobs well. This is especially true for the sales and service staff whose success in expanding their organisations' market share by bringing in new customers and maintaining excellent business relationships with existing customers helps organisations grow by continuing to bring in revenues. It is not surprising that this is a group that most training managers focus on (even when budgets are tight). Sales and service departments are amongst an organisation's top training priorities and get the lion's share of an organisation's training budget (Cespedes & Lee, 2017). Given their strategic importance to an organisation, I thought it would be apt to choose this group as the participants of my research, along with training managers.

Another reason for my zeroing in on sales and service personnel as the focus of my research is to do with the travelling nature of their jobs or their mobility. This I thought made them the ideal consumers of mobile learning, as they seldom had dedicated time for training while in office and most of them were likely to want to have training on the go. It is not surprising that most of the sales workforce (who are mobile) are familiar with and use mobile learning (Couto, 2016).

The implications of these points are that learners (employees) recruited for the project would need to be members of sales and service departments who had experience of mobile learning within the corporate. The training managers recruited for the project, on the other hand, would need to have experience in providing mobile learning to sales and service staff. Such managers might not necessarily be part of the sales and service department themselves, so long as they were involved in providing mobile learning to those departments. It was predictable that such managers would likely have experience in providing other forms of training (including via e-learning), and that they might also provide training to other staff members, but the core criteria for recruitment nonetheless remained concerned with their experience of mobile learning provision to sales and service staff.

4.2.3 Applying the Methodology

- a) Units of Analysis: I conducted three case studies in three corporate organisations, with two training managers and thirty sales and service staff in two organisations and two training managers and twenty-one staff in the third organisation as the primary sources of data for my research study on mobile learning.
- b) Data Collected: Data was collected from the three corporate organisations. Though information on the organisations is in the public domain, I cannot reveal the sources due to confidentiality issues. Each of the three case studies involved gathering data from two types of participants – training managers and staff.

Data from the training managers was collected through semi-structured telephonic interviews designed around a certain number of pre-set questions about their opinions, perceptions, and predictions of mobile learning – at a managerial level. The proceedings were audio recorded, transcribed, and edited for analysis.

Data from the sales and service staff was collected through a structured questionnaire administered online about their experiences and perceptions at an operational level.

I realise the manager-respondents had no knowledge of some of the options provided for some questions, and therefore, their responses to such questions were scanty (their responses could have been different if they had knowledge of all the options to the questions). The same may have been the case with the staff-respondents, who may have ignored the options they were not familiar with.

c) Mapping from Research Questions to Data Gathering Questions: Themes and Questions for a Semi-structured Interview for Training Managers

Theme	Main Question	Follow-up Questions
1. Definition of Mobile Learning	How do you define 'Mobile Learning'?	<ol style="list-style-type: none"> 1. Do you think the type of device matters? 2. What about the mobility of the learner? 3. Does content dictate what is mobile learning? 4. Is there any preferred specific location for mobile learning such as customers' place, or during travel? 5. Any comments on the duration of learning?
2. Relationship with e-learning	<p>Do you think mobile learning is related to e-learning?</p> <p>Why do you think so?</p>	<ol style="list-style-type: none"> 1. Are there any commonalities? 2. Are there any differentiating factors? 3. Is it something totally unrelated and new? 4. Does its design and development differ?

3. One programme of adoption	Can you describe your experience with one corporate mobile learning initiative in particular? OR If you were to initiate mobile learning in your organisation, what would it be? Why? How would you go about it?	1. Follow up questions were based on specific responses.
5. Its usage	How is mobile learning used or planned to be used?	<ol style="list-style-type: none"> 1. Are the learners expected to use mobile learning on their own? 2. Would they ever use it in a group? 3. Do people using the mobile learning come together and talk to each other face-to-face? 4. Are learners encouraged to talk to other learners using their mobile devices, perhaps to help each other out? 5. How much control do learners have over the mobile devices they use to access the content? 6. Can they choose what content to receive and when to receive it? 7. Can they contact tutors to ask questions? 8. Are there any rules in place about using the devices or asking questions of tutors?
6. Its effectiveness	How effective do you think mobile learning is, as a way to gain knowledge, skills and attitudes?	<ol style="list-style-type: none"> 1. Can we acquire substantial learning? 2. Do you think we can learn new skills with it? 3. Can we conduct behavioural training? 4. Is it effective in certain contexts/ situations?
7. Barriers to Adoption	What do you think are the main barriers to the adoption of mobile learning?	<ol style="list-style-type: none"> 1. Do you think mobile learning proved itself to justify commitment of resources? 2. Do IT policies impact adoption? 3. Do physical/ technical limitations such as screen size hinder adoption?
8. Benefits	What do you think are the main benefits of mobile learning?	<ol style="list-style-type: none"> 1. To the learner? 2. To the organisation?
9. Limitations	What do you think are the main limitations of mobile learning?	<ol style="list-style-type: none"> 1. In terms of subjects? 2. Technological limitations? 3. In terms of audience type?

Table 4.1 Themes and Questions for a semi-structured interview for Training Managers

4.2.3.1 Research Questions and Structured Questionnaire for Training Managers and Staff

Structured and Online Questionnaire (for Staff)

Research question or sub-question	Data gathering questions in questionnaire	Notes
RQ 1.4.1: How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?	Questions 3, 4, 5, 6, 8, 9 & 11	Question 1 is an introductory question about the respondents' definition of mobile learning
RQ 1.4.2.1: How do training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices?	Questions 2 & 7	Question 7 is a follow up question that delves deeper into the applications of e-learning. It would be useful to compare and contrast the data collected with Question 7 against that of Question 2, which is about the relationship between mobile and e-learning.
RQ 1.4.2.2: What are the perceptions of training managers and sales and service staff about the reasons for adopting mobile learning?	Question 12	n/a
RQ 1.4.2.3: How do corporate training managers perceive the benefits and limitations of mobile learning approaches when used in practice, with different members of sales and service staff, in particular, the 'millennials'?	Question 5	n/a
RQ 1.4.2.4: Are there any discernible differences in perceptions of mobile learning with different members (training managers and sales and service staff)?	n/a	Answer to this question will be arrived at from the answers to the above questions

Table 4.2 Structured and online Questionnaire (for Staff)

Semi-structured Interviews via Telephone (for Training Managers)

Research question or sub-question	Data gathering questions in questionnaire	Notes
RQ 1.4.1: How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?	Questions 3, 4, 5, 6, 8, 9 & 11	The follow up questions were: <ol style="list-style-type: none"> 1. Can we acquire substantial learning? 2. Do you think we can learn new skills with it? 3. Can we conduct behavioural training with it? 4. Is it effective only in certain contexts/learners?
RQ 1.4.2.1: How do training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices?	Questions 2 & 7	<ol style="list-style-type: none"> 1. The other follow up questions were: 2. Are there any commonalities? 3. Are there any differentiating factors? 4. Is it something totally unrelated and new? 5. Does its design and development differ?
RQ 1.4.2.2: What are the perceptions of training managers and sales and service staff about the reasons for adopting mobile learning?	Question 12	The other follow up questions were: <ol style="list-style-type: none"> 1. Do you think mobile learning proved itself to justify the commitment of resources? 2. Do IT policies impact its adoption? 3. Do physical/ technical limitations such as screen size hinder adoption?
RQ 1.4.2.3: How do corporate training managers perceive the benefits and limitations of mobile learning approaches when used in practice, with different members of sales and service staff, in particular, the 'millennials'?	Question 5	The other follow up questions were around limitations in terms of: <ol style="list-style-type: none"> 1. Subjects 2. Technological limitations 3. Audience types
RQ 1.4.2.4: Are there any discernible differences in perceptions of mobile learning with different members (training managers and sales and service staff)?	n/a	Answer to this question will be arrived at from the answers to the above questions

Table 4.3 Semi-structured Interviews (for Training Managers)

Research Questions and Structured Questionnaire for Training Managers and Staff

Research question or sub-question	Instruments that will contribute to answering this question	Data gathering questions in questionnaire	Notes
RQ 1.4.1 How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?	Structured and online questionnaire (for staff)	Questions 3, 4, 5, 6, 8, 9 & 11	Question 1 is an introductory question about the respondents' definition of mobile learning
	Semi-structured interviews via telephone (for training managers)	Questions 3, 4, 5, 6, 8, 9 & 11	The follow up questions were: <ol style="list-style-type: none"> 1. Can we acquire substantial learning? 2. Do you think we can learn new skills with it? 3. Can we conduct behavioural training with it? 4. Is it effective only in certain contexts/learners?
RQ 1.4.2.1 How do training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices?	Structured and online questionnaire (for staff)	Questions 2 & 7	Question 7 is a follow up question that delves deeper into the applications of e-learning. It would be useful to compare and contrast the data collected with Question 7 against that of Question 2, which is about the relationship between mobile and e-learning.
	Semi-structured interviews via telephone (for training managers)	Questions 2 & 7	The other follow up questions were: <ol style="list-style-type: none"> 1. Are there any commonalities? 2. Are there any differentiating factors? 3. Is it something totally unrelated and new? 4. Does its design and

			development differ?
RQ 1.4.2.2: What are the perceptions of training managers and sales and service staff about the reasons for adopting mobile learning?	Structured and online questionnaire (for staff)	Question 12	n/a
	Semi-structured interviews via telephone (for training managers)	Question 12	The other follow up questions were: 1. Do you think mobile learning proved itself to justify the commitment of resources? 2. Do IT policies impact its adoption? 3. Do physical/ technical limitations such as screen size hinder adoption?
RQ 1.4.2.3: How do corporate training managers perceive the benefits and limitations of mobile learning approaches when used in practice, with different members of sales and service staff, in particular, the 'millennials'?	Structured and online questionnaire (for staff)	Question 5	n/a
	Semi-structured interviews via telephone (for training managers)	Question 5	The other follow up questions were around limitations in terms of: 1. Subjects 2. Technological limitations 3. Audience types
RQ 1.4.2.4: Are there any discernible differences in perceptions of mobile learning with different members (training managers and sales and service staff)?	Structured and online questionnaire (for staff)	n/a	Answer to this question will be arrived at from the answers to the above questions
	Semi-structured interviews via telephone (for training managers)		

Table 4.4 Research questions and structured questionnaire

The next two sections will detail how the different instruments were designed and how the data from them was analysed.

Research Participants: I chose two distinct and different types of participants because I wanted to 'build a rich picture' with different views, perceptions, and experiences of different individuals Hamilton & Corbett-Whittier (2011).

Training managers are responsible for training and development of the staff in their organisations, with the discretionary and monetary power to decide on any methodology or initiative they deem most suitable. For them, a training methodology is a means to achieve the end, the end being performance enhancement of staff to, in turn, achieve business results.

The sales and service staff are the recipients of training. In my professional experience, the opinions of the staff are most important for any training initiative to survive and grow. Ultimately, their perceptions impact their learning results. Negative perceptions could possibly lead to discontinuing the initiative.

The training managers offer unique perspectives of those utilising mobile learning to train their staff to achieve certain terminal objectives in terms of performance and business goals. On the other hand, the sales and service staff who actually 'consume' training through this methodology would have different experiences.

There are other distinct groups within the organisation such as top management, trainers, and subject matter experts (SMEs) that were not included in the study for the reasons given below.

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- Top management: Although relatively small and the most influential group in an organisation, mobile learning as a training methodology is too tactical for them to have an opinion on. Though their opinion as users of mobile learning could influence its adoption or otherwise, I did not consider them because it was very difficult to find members of a top team with experience or opinion on mobile learning willing to talk to me.
 - Trainers and SMEs: Generally, in organisations, even today, classroom training is the most used (and the most invested in) training methodology. The trainers are SMEs from different areas of expertise and function, whose primary responsibility usually is not training others. It is rare for an organisation to employ full time trainers unless they have a fully established training centre.

Sampling Strategy: Sampling is the activity of selecting a part of the population that is representative of the entire population, and a sampling strategy is about selecting the right sample (Landreneau & Creek, 2009). Unlike quantitative studies where statistical representation is important, in qualitative studies, the character of the sample is more important than the actual representation of the entire population. As qualitative research aims to uncover the understanding of a phenomenon through the experiences and options of people studied, it does not restrict itself to preordained concepts. The study unearths the data, which formulates hypotheses and theory (Wilmot, 2005). I chose the non-probability sampling strategy based on the character of the individuals, as I needed a phenomenon to appear just once in

the sample. The organisations that the interview participants worked in were very large (>US\$1 billion in revenues) with at least 5 years of organisational experience in using technology-based training to train their staff.

Participant Type 1 – Training Managers: They were qualified and experienced middle to senior level corporate training and/or e-learning managers, selected based on their educational backgrounds (Master's in E-learning or Instructional Design) and at least 10 years' experience in corporate training and e-learning. I interviewed two such managers in each organisation, a total of six managers across the three case studies. It has been my experience that even in very large organisations, there would usually be no more than two senior managers responsible for training and development. Interviewing those two managers in the organisation would almost entirely reveal the gamut of training, including new initiatives such as mobile learning.

Participant Type 2 – Sales and Service Staff: These were from unit-organisations with experience in taking training courses via e-learning or mobile learning. As their population usually runs into hundreds of thousands, I selected a convenience sample of about 30 respondents from each organisation, using stratified sampling to choose persons relatively more experienced in e-learning in each stratum – a department or function in the organisation. My aim was to reach out to about 100 users across the three case studies.

4.3 Data Collection Methods

Data was collected from the training managers and sales and service staff. My sample size for the training managers was six (two in each organisation) and eighty-one for the staff (30+21+30). The use of semi-structured interviews and structured questionnaires to collect data from the two diverse groups proved suitable for my case study research approach.

4.3.1 Semi-Structured Interviews

I chose semi-structured interviews to collect data from training managers as the respondents were fewer in number and would furnish deeper substantial qualitative data. The main questions in the interviews were designed to gain insight into the perceptions of training managers on the definition, appropriateness, benefits, and drawbacks of mobile learning. The main questions were followed by multiple related questions to elicit information at a deeper level, based on the primary responses of the interviewee.

4.3.2 Structured Questionnaires

I chose structured questionnaires for the sales and service staff as they were more in number and spread across the world. As I expected relatively specific responses from this group, a structured questionnaire delivered online to the participants was found suitable.

The questionnaires were designed to capture the perceptions of the staff on their experiences at a peripheral level, not on a deeper or qualitative level. In-depth information about the subject was to be investigated using semi-structured interviews for the training managers.

A more detailed overview of how this instrument relates to the research questions is provided at the end of this section.

Semi-structured interviews are a widely used technique in qualitative research as they provide the interviewer flexibility beyond a rigid set of questions. They rely on the skill of the interviewer to delve and uncover unknown and often unexpected insights and opinions of the respondents (Zorn, 2008).

As my first group of participants were training managers from whom I expected more in-depth and qualitative data, I used terminology specific to their industry and organisation. I also explained what my research was about, what the interview would cover, and how they would contribute to it. After taking their consent, I fixed up appointments with them, blocking one to one and a half hours for each interview.

For the second group of participants, the sales and service staff, I customised the terminology to suit their industry and organisation. As this group is dispersed across the globe in various locations (offices, factories, customer sites), I delivered the questionnaire online so they could conveniently access

it via a browser and quickly click their responses. The hyperlink to the questionnaire was sent to their official emails through their managers.

An overview of the items in the instrument and how they relate to the research questions:

Data gathering questions	Research Question or sub-question	Notes
1. Mobile learning is:	RQ 1.4.1: How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?	The responses to questions 3,4,5,6,8,9 and 11 need to be combined with the responses to this question to address Research Question 1.0
2. The relationship of mobile learning to other forms of e-learning:	RQ 1.4.2.1: How do training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices?	The response to question 7 needs to be combined with the response to question 2 to address the Research Question 2.1
3. Mobile learning is effective for:	RQ 1.4.1 How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?	The responses to questions 1,5,6,8,9 and 11 need to be combined with the responses to questions 3, 4 and 5 to address the Research Question 1.0 The response to question 5 also needs to be taken into consideration to address research question 1.0/
4. Mobile learning can be used in the following locations:		
5. Mobile learning is suitable for the following types of learners:		
6. Mobile learning is suitable for the following subjects:		
7. E- learning is suitable for the following subjects:	RQ 1.4.2.1: How do training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices? RQ 1.4.2.3: How do corporate training managers perceive the benefits and limitations of mobile learning approaches when used in practice with different members of sales and service staff, in particular, the 'millennials'?	The response to question 2 needs to be combined with the response to question 7 to address the Research Question 2.1

8. The best technological tools to access mobile learning are:	RQ 1.4.1: How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?	The responses to questions 1, 3,4,5,6 and 11 need to be combined with the responses to questions 8,9,10 and 11 to address the Research Question 1.0
9. Mobile learning can:		
10. Mobile learning is beneficial to the organisation because of its:		
11. Mobile learning is beneficial to the learner because of its:		
12. Enabling and restraining factors for mobile learning are:	RQ 1.4.2.2: What are the perceptions of the training managers and sales and service staff about the reasons for adopting mobile learning?	This is a stand-alone question

Table 4.5 An overview of the items and how they relate to the research questions

4.4 Data Analysis Approach

- a) The research data for the case studies are contained in two research sites – data from the semi-structured interviews in one site and data from the online structured questionnaires in another. I first analysed the data from each site separately and then brought them together for comparison. I decided to form one narrative for each case to develop unique and individual case studies before attempting any cross-case analysis. I transcribed the audio recording of the interview proceedings verbatim, and subsequently edited the transcribed text into a more readable form by removing fillers, digressions, and repetitions. Multiple revisions were made to the transcribed text while listening to the recording, and any gaps were filled using my notes of the interviews. Finally, I transferred the transcript into a transcript template with line numbering for easy reference. The

second data source from the filled and submitted online structured questionnaires by the respondents was automatically exported into a spreadsheet.

- b) Data analysis includes examining, categorising, tabulating, and testing the collected data. According to Yin, there are five methods of analysis – matching patterns, building explanations, time series analysis, logic models, and cross-case synthesis (Yin, 2014, pp. 133-170). I chose the explanation building approach as it was best suited to meet my objectives.
- c) The explanation building approach of analysis is a special form of pattern matching that aims to build an explanation for the case, in this instance, the perceptions of training managers and staff on mobile learning. It is an iterative process which starts with an initial theoretical statement or an explanatory proposition with which the findings are repeatedly compared until a valid explanation of the phenomenon is built.
- d) I also chose the cross-case analysis as I wished to make a cross-case comparison synthesis of the three separate cases of my study for more robust results.
- e) Analysing case study evidence is especially difficult because the techniques of analysis are still evolving (Yin, 2014, p. 133). Whatever the strategy, it is important to produce high-quality analysis considering all the evidence, and displaying, presenting, and interpreting it.
- f) My data analysis explored the commonalities and differences, with themes and exceptions emerging in each of the three settings. I analysed the data

using Sharples' framework. My analysis was deductive, based on the theoretical headings to interrogate the data and to differentiate between the responses of training managers and staff. I was also alert to any unanticipated themes that might emerge from the data.

4.4.1 Addressing the Research Questions

In the table below, the main and sub-questions of the study were mapped to the heads of analyses (themes) and to the question stems in the questionnaire.

Research Questions	Heads of Analyses	Data Collection Design
RQ 1.4.1 How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?	Initial experiences of mobile learning if adopted	Mobile learning is...
	Kinds of communication and conversations within mobile learning	
	Contexts in which people use mobile learning	
	Initial experiences of mobile learning if adopted	The relationship of mobile learning to other forms of e-learning...
	Kinds of communication and conversations within mobile learning	
	Contexts in which people use mobile learning	
	Initial experiences of mobile learning if adopted	Mobile learning is effective for...
	Kinds of communication and conversations within mobile learning	
	Contexts in which people use mobile learning	
	Kinds of communication and conversations within mobile learning	Mobile learning can be used in the following locations...
	Contexts in which people use mobile learning	
	Kinds of communication and conversations within mobile learning	Mobile learning is suitable for the following types of learners...

	Contexts in which people use mobile learning	
	Kinds of communication and conversations within mobile learning	Mobile learning is suitable for the following subjects...
	Contexts in which people use mobile learning	
RQ 1.4.2.1: How do the training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices?	Kinds of communication and conversations within mobile learning	E-learning is suitable for the following subjects...
	Contexts in which people use mobile learning	
RQ 1.4.2.2: What are the perceptions of the training managers and sales and service staff about the reasons for adopting mobile learning?	Perceived change of their knowledge and skills as a result of mobile learning	Mobile learning can provide me...
	Perceived change of their knowledge and skills as a result of mobile learning	Mobile learning is beneficial to the organisation because it is...
	Perceived change of their knowledge and skills as a result of mobile learning	Mobile learning is beneficial to the learner because it is...
RQ 1.4.2.3: How do corporate training managers perceive the benefits and limitations of mobile learning approaches when used in practice, with different members of sales and service staff, in particular, the 'millennials'?	Issues of human-computer interaction they experience (including rules imposed by the company, device features, and hardware/software problems)	The best technological tools to access mobile learning are...
	Technological tools people use to access the training	The best technological tools to access mobile learning are...
	Issues of human-computer interaction they experience (including rules imposed by the company, device features, and hardware/software problems)	Barriers to mobile learning are...
RQ 1.4.2.4: Are there any discernible differences in perceptions of mobile learning with different members (training managers and sales and service staff)?	The manner in which training managers and sales and service staff view mobile learning	Answer to this question will be arrived at from the answers to the above questions
	The way training managers and sales and service staff use mobile learning	

Table 4.6 Mapping of themes to questions

The following is an overview of the process of analysis shown as a flow diagram:

For each of the three cases	
Research Site 1 Semi-structured Interview Data	Research Site 2 Structured Questionnaire Data
Collection	
Transcript Templates	Spreadsheets
Tabulation Individual Respondents, Groups of Respondents, Organisation	
Categorisation Individual Respondents, Groups of Respondents, Organisation	
Explanation building Case Study	
Analysis Cross-case Analysis of the three cases	

Table 4.7 An overview of the process of the analysis shown as a flow diagram

4.5 Research Ethics

Although the study was not expected to negatively impact human subjects, there remained certain concerns. The first group of respondents were training managers who were well educated and fairly senior in the organisational hierarchy. After approaching this group, a written proposal was sent to the potential respondents explaining the purpose, nature, and scope of the study, assuring them that the privacy/confidentiality of the interviewee and of their organisation would be protected. After receiving a written consent from them, permission was taken to record the interview proceedings. Their participation was entirely voluntary without any overt or covert coercion from the top management to participate in the study.

On the other hand, the second group of respondents were staff at different levels of seniority and authority in the organisations. This group was approached through their line managers and training managers to participate in the study. They were also informed about the study, its purpose, and promise of confidentiality. As it was possible that some of them would have felt obligated to obey their managers' request, I ensured the organisational power dynamics did not in any way force the staff to participate in the study by informing them in the online questionnaire that their participation is entirely voluntary and they could opt out of the study at any time. I also assured them in the questionnaire that their furnishing their personal details was totally voluntary. Judging by the high response rate from the staff, it could be assumed that the participation was voluntary.

The Research Ethics Committee of the university approved my study.

4.6 Strengths and Weaknesses of Research Design

Although much is being said about mobile learning in the context of corporate training in recent years, not many organisations are actually adopting mobile learning on a large scale. Therefore, I had professional reasons as well as intellectual curiosity to investigate why its adoption was not commensurate with its obvious advantages. I have provided more details on why this project is important to me in *Chapter 1*.

I chose the case study approach based on three parameters – my research objectives, my worldview, and the theoretical framework adopted for my study. My research objectives were essentially ‘Why’ and ‘How’ type of questions, ideal for a case study approach. Additionally, the fact that my participants and the phenomenon of study are in real organisations and could not be managed or manipulated, made it more suitable for the case study approach (Yin, 2003). I chose to study multiple cases as I believed it would provide me opportunities to understand the similarities and differences between the cases, leading to more robust and reliable results (Baxter & Jack, 2008). I have provided more details about the rationale for my choice in *section 4.2.2*.

I believe the findings of this study would significantly benefit all players – stakeholders, training managers, staff, and vendors of products and services of e-learning/mobile learning. This study would inform the vendors about the present status of technology from a user’s perspective and encourage them to refine/modify their services to suit the users or educate them on their perceived limitations.

More importantly, I hope this research would contribute to academic literature by:

- a) Adding clarity to the existing literature on the definition of mobile learning from a corporate perspective

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- b) Gaining new insights into the relationship between e-learning and mobile learning in the workplace
 - c) Identifying current obstacles to adopting mobile learning

By providing new insights on mobile learning in the corporate context, I hope this study would also help improve the effectiveness of training in corporate organisations.

4.6.1 Key Strengths

The key strength of my project is that it drew upon multiple data sources – across departments and geographies – producing data for a very rich picture of each case. It also enabled comparing cases from all over the world.

Despite the thoroughness in selecting the research approach, like most research projects, this project also does have some weaknesses and limitations, as enumerated below.

4.6.2 Weaknesses and Limitations

Some potential weaknesses in my project can be listed as under:

- a) The perceptions of the top management about the utility of mobile learning in terms of return on investment have not been included. The top management usually has the authority to approve investments and budgets. It is possible they were not aware and/or not convinced about the usefulness of mobile learning. Although collecting their perceptions and opinions would have helped build a more comprehensive picture, it was difficult to get access to them. Also, their willingness to participate in such a study would be doubtful as mobile learning is not high on their list of priorities. I have tried to offset the lacuna of this data by eliciting the top management's opinion from the training managers themselves.

- b) The number of staff from each organisation to be included in the study was fixed at around 30 for convenience. This sample size is extremely low when compared to the approximately 100,000 employees in each organisation. It is possible that the sample is not a true representation of the population. Although it is theoretically possible to reach most employees via an online questionnaire, the management of the organisations did not permit large-scale surveys. I had decided that about 30 people per organisation would be acceptable and convenient, and at the same time, provide me sufficient quantity and quality of data to arrive at valid results. I endeavoured to reduce the weakness of the small sample size by stratifying the selection of the sample across functions and levels.

c) IT policies and procedures, including IT security policies, are laid down by the IT department. Generally, IT departments across organisations and industry verticals are of the opinion that mobile learning compromises the IT security of a company. Although this accusation is contested at various quarters, not including IT personnel from the study meant that certain IT related reasons for low adoption of mobile learning could have been missed. Here again, I have tried to offset this information gap by collecting data from the training managers on the impact of IT policies on the adoption of mobile learning.

While I tried to address the weaknesses of this study as best I could, it should be noted that too much cannot be claimed from the data in the later parts of the thesis document.

4.6.3 Generalisation and Representativeness

It is possible some readers might perceive the findings too specific and not 'generalisable' for various reasons, including their epistemological and/or ontological positions. I do not hold such criticism valid as I believe that what I had investigated in different local circumstances (in some specific organisations) is precisely how the phenomenon plays out. differently in different contexts (Bligh & Coyle, 2013, p. 354).

As stated in the earlier chapters, the purpose of the case study design is to study phenomena and context, based on the assumption that these were closely related. So, it is an assumption of my research design that mobile learning in the corporate context is to some extent contextually influenced and manifested differently in different corporate settings.

The research design did not allow for drawing very general conclusions. However, it reflected the fact that mobile learning in corporate settings would likely take very different forms.

I intended to address the issue of generalisation by focussing on different aspects of each case using Sharples' framework as a starting point and attempting to clarify those aspects of each corporate setting that influenced my findings.

My aim was to produce research that was credible, trustworthy, and authentic, rather than statistically reliable (Yilmaz, 2013, pp. 311-325). In order to ensure credibility, I have used a checklist of questions as suggested by Miles and Huberman (Miles & Huberman, 1994, p. 279). I am confident that I have established a credible and strong footing to develop the findings and understand the role mobile learning plays or may come to play in the corporate training environment in large organisations.

4.7 Presenting the Research Findings

The research study generated a lot of very interesting and rich data that was difficult to convey to the readers while remaining within an acceptable length and retaining a sense of focus within the narrative.

That said, my key priorities (finding answers to my research questions) remain in focus. In the next chapter, I will in most part, prioritise information that addresses those questions directly. I chose the linear-analytical structure, as it is a standard yet comprehensive approach (Yin, 2014, pp. 177 - 206).

As I studied three organisations, my report will consist of three single individual cases as sub-chapters culminating in a cross-case analysis chapter and results.

My findings will include quotations from participants that illustrate 'typical' responses when discussing the themes arising from the study. It will also include quotes from people who had particularly strong opinions, or whose opinions were different in some way as I wished to record a range of different responses, and to have represented those 'negative cases' in order to paint not only a rich picture but also a varied one to enhance the validity of the study.

5 Findings

5.1 Introduction

This chapter presents three case studies (*sections 5.3, 5.4, and 5.5*) based on the data collected from three corporate organisations. The organisations have been described in detail in *Chapter 4 (Research Design)*. It also presents an analysis (*section 5.6*) of the findings from the three case studies to identify similarities and differences among them.

As described in more detail in *Chapter 4*, the data for each case was collected from two sources – two training managers and about thirty members of the sales and service staff. Data from the training managers was collected through semi-structured telephonic interviews. In all cases, the training managers were qualified and experienced (middle to senior level) corporate training and/or e-learning managers with more than 10 years' experience in their current role.

The data from the staff was collected through a structured online questionnaire. The staff had taken at least one training course via e-learning and/or mobile learning.

In the sections that follow, case reports for each organisation are presented in turn. For each case (representing one corporate organisation), the data collected is presented under two distinct sub-sections:

a) The first sub-section, “Brief Profile of the Company”, presents information on the company, its training needs and methodologies, the perceptions of the study participants on mobile learning, e-learning’s relationship with mobile learning, and the benefits and effectiveness of mobile learning. This information is provided to present the broad context of the mobile learning initiative, in keeping with the emphasis of the theoretical framework on context (see *Chapter 4, section 3*). This sub-section contains the following headings:

- About mobile learning in the company: A brief background of the company, its business, and training initiatives
- Relationship to established e-learning provision: A description of how training managers and staff perceive the relationship between e-learning and mobile learning
- Key aspects of mobile learning: A description of key features of mobile learning as perceived by the training managers and staff
- Key objectives being sought in the organisation: A description of what the organisation was seeking to accomplish with mobile learning and the benefits it wishes to utilise
- Key aspects of mobile learning: A description of how the training managers and staff define mobile learning

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- b) The second sub-section focuses on how mobile learning is undertaken at a practical level. The participants' perceptions on the mobile learning activity in the company are presented based on Mike Sharples' framework of mobile learning.

Although a detailed explanation of the framework was given in *Chapter 3 (Theoretical Framework)*, a brief overview is presented here to guide the reader in understanding the structure of the case reports that follow.

5.2 A Brief Review of Mike Sharples' Framework

The framework itself is presented as a diagram (Figure 5.1) showing the interrelations and interactions among the components – the subjects, objects (and modified objects), technological tools on one hand, and control, context, and communication between the various components on the other. The discussion on how mobile learning is undertaken in each case will focus on the elements of the framework as follows:

- a) **Subjects:** This section covers the profile of the staff, their initial experiences, and perceptions of mobile learning – who they are, their backgrounds, existing skills and experiences, and information about them as learners and technology users.
- b) **Objects:** These are what the subjects are seeking to achieve – the information, knowledge, and skills. Changed objects are revised or perceived changes in knowledge and skills as a result of mobile learning.

- c) **Technological Tools:** These include mobile devices, ICT and mobile technologies, and learning technology. There are two layers – a technological layer that includes the technological aspects and their interactions with learners, and a semiotic layer that includes the learners and the interactions among them.

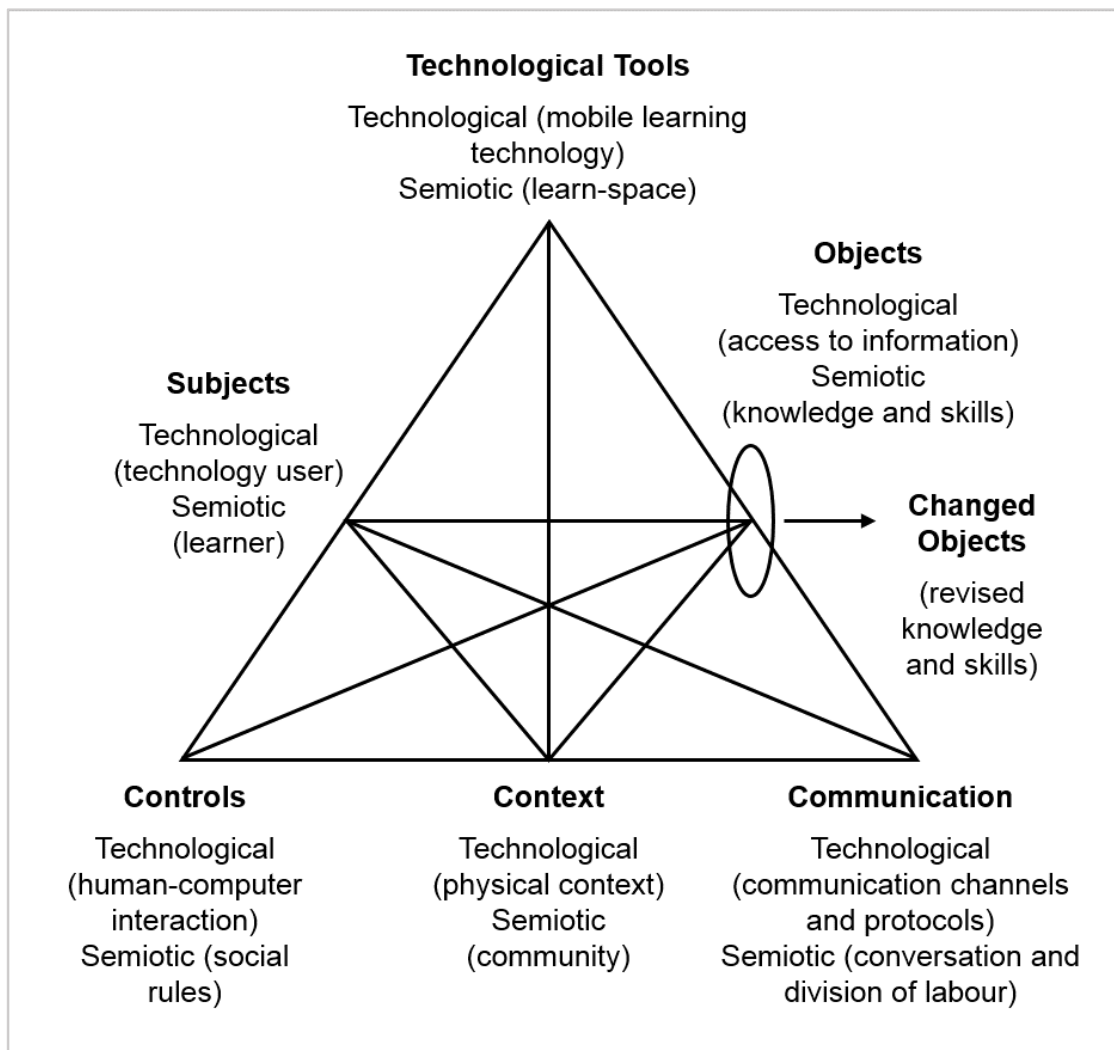


Figure 5.1 A Framework of Mobile Learning
(Sharpley et al., 2005)

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- d) **Context:** Context includes the various actors or groups (communities) who interact around a shared object (learning material) and the environment where learning takes place (locations).
- e) **Control:** Control describes the forces and actors that control or impact the learning of the Subjects. Control usually passes from one party to the other, between training managers and learners, among learners, and between learners and technology. Control may also be held by technology at various times. Lastly, social rules of behaviour also control learning as they govern what is acceptable and what is not.
- f) **Communication:** Communication occurs between and among all the actors in the system, enabled by technology. Multiple channels facilitate these 'conversations'.

5.3 Case Report 1: ABT Pharma Limited

5.3.1 Background

5.3.1.1 Brief Profile of the Company

According to the company's website and other sources on the public domain, ABT Pharma Limited (a pseudonym) is a publicly traded, Indian subsidiary of an American multinational organisation in the healthcare industry, ranking among the top ten pharmaceutical companies in India.

The main audience for training in the company are the sales personnel (medical representatives). For this study, data was collected from two (2) training managers and thirty staff (30) members from the sales function.

5.3.1.2 About Mobile Learning in ABT Pharma Ltd

According to the training managers, although most training continues to be in the classroom, the company introduced e-learning about ten years ago to reduce costs, improve learning, and reduce 'time-to-market' with gratifying results and has installed an LMS to host, administer, and track its classroom and online training. There are approximately 2000 sales professionals availing e-learning, and now mobile learning, in the company.

In the following sections, the opinions of the training managers and sales staff on the relationship between e-learning and mobile learning, definitions of mobile learning, and its benefits and effectiveness are presented.

5.3.2 Relationship to Established E-learning Provision

“Both e-learning and mobile learning are related because both don’t happen in the classroom. But both are different, in the tools or devices that are used to access the content.” – Training Manager 1

The relationship with established e-learning provision is seen to be a close one by most respondents when it comes to mobile learning being a part of e-learning and NOT an entirely new way of learning. The points of difference between the two are stated to be in the location of learning, type of device used, and the kind of content presented. The relationship with established e-learning provision is NOT seen to be a close one when it comes to mobile learning being the same as e-learning.

Both respondents thought e-learning and mobile learning were closely related, with 73% of staff believing mobile learning is a part of the larger e-learning, and 33% that they are the same (Figure 5.2)

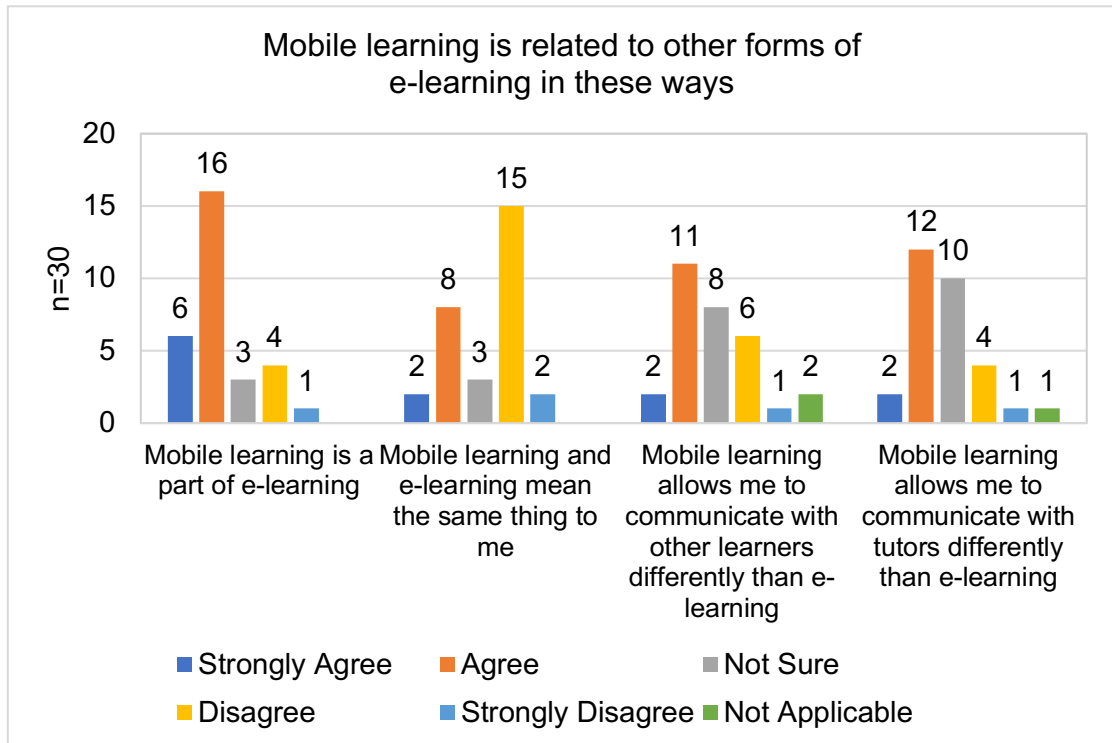


Figure 5.2 Relationship to Established E-learning Provision (a)

According to the training managers, e-learning and mobile learning are more closely related than classroom training and e-learning. One of them felt technology is the binding factor between e-learning and mobile learning which are like "two sides of the same coin" and "should be used complementarily" and not viewed as different. They should be "talking to each other". The second manager also considered e-learning and mobile learning to be similar because in both, learning happens when the learner "is outside (the classroom)", typically "in a public place, hotel or cybercafé". When asked to compare mobile learning with e-learning, 43% of staff thought mobile learning allows learners to communicate differently with other learners and with their tutors (47%) (Figure 5.2) compared to e-learning.

67% thought they could use a greater range of technologies to access content with mobile learning, and 87% felt they could have access to learning content from more locations (Figure 5.3).

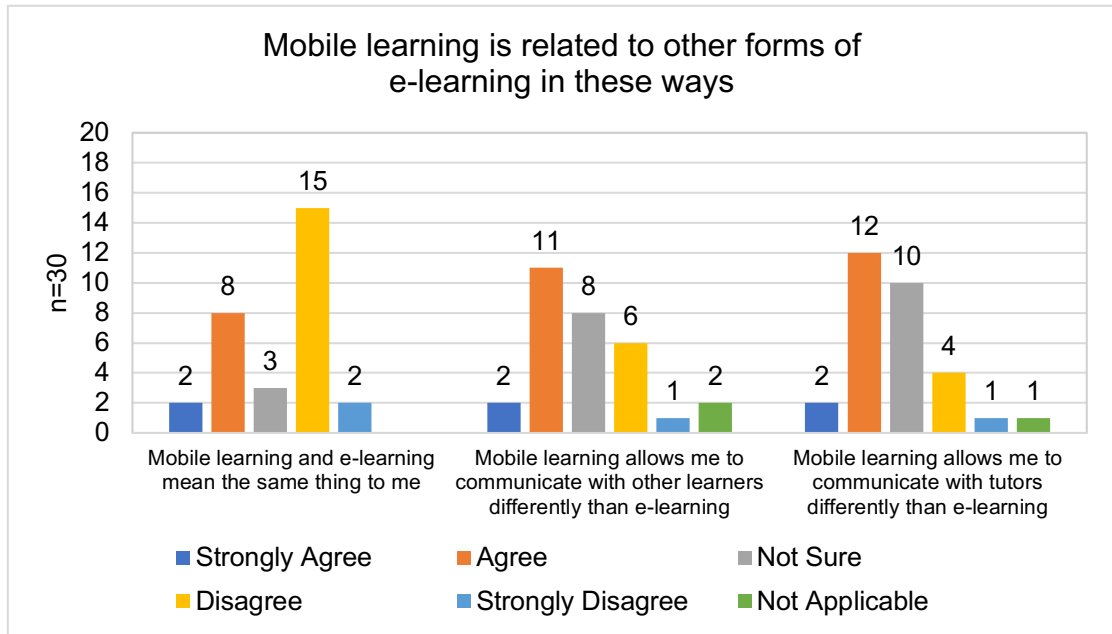


Figure 5.3 Relationship to Established E-learning Provision (b)

One of the training managers felt certain features work better in e-learning – “animations work better in e-learning than in mobile learning”. The second training manager thought learning content for e-learning is primarily suitable for laptops or computers while that of mobile learning for iPads or mobile phones, and that the content for e-learning is considered heavy and difficult to understand while that for mobile learning, easy to assimilate.

Both the training managers and 53% of staff thought mobile learning is NOT entirely different from e-learning, only 23% saying it is entirely different (Figure 5.3). One of the training managers did not “see mobile learning as a totally new way of learning”, more as an extension of e-learning.

5.3.3 Key Aspects of Mobile Learning

Mobile learning is:

“learning through a mobile phone, while on the move” – Staff

“while the learner is travelling, waiting at the airport or at the doctor’s chambers, wherever he is able to access that learning” – Training Manager 1

73% of staff felt mobile learning is “*learning through a mobile phone, while on the move*” and 70% as “*learning while on the move*” (Figure 5.4). While Manager 1 considered mobile learning as ideal for solving work-related problems in the field, whether the person was mobile or not, Manager 2 thought mobile learning is any learning activity that a learner could access and complete in the field while mobile. The emphasis is on the learner’s mobility.

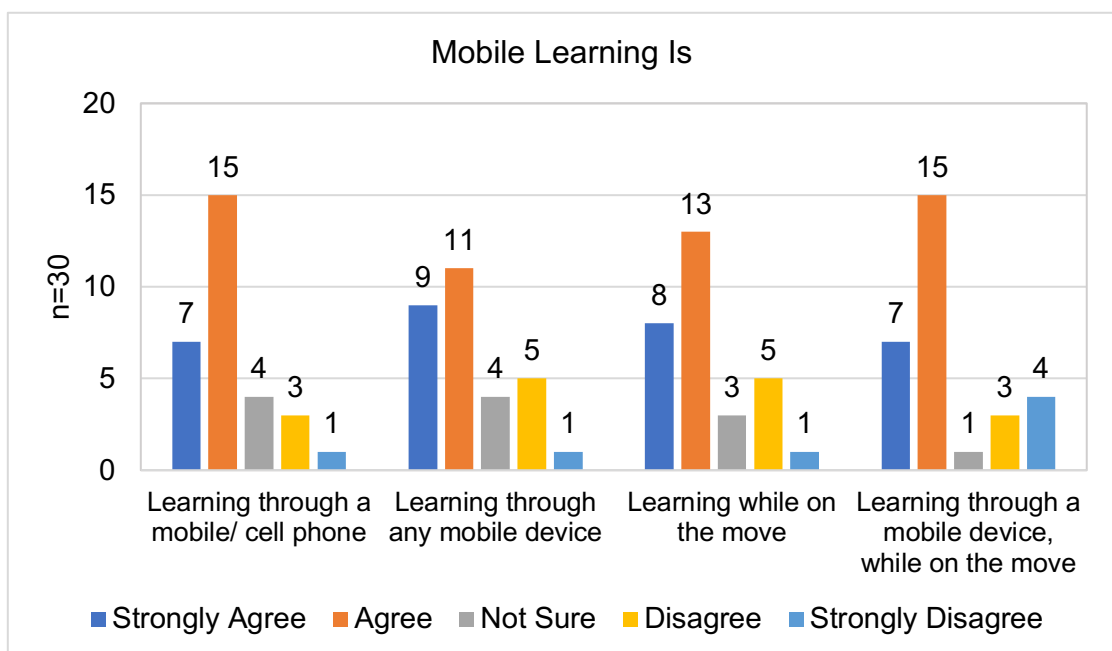


Figure 5.4 Key Aspects of Mobile Learning

73% of staff thought mobile learning “*is learning through a mobile phone*”, while 67% thought it “*is learning through any mobile device*” (Figure 5.4). One of the training managers believed mobile learning “*can happen on any suitable device including a laptop*”. He did not think the device needs to fit into a person’s hand or purse, as long as it suits “*the specific need of the learner and the topic*”. He also believed a mobile phone would do for simple learning material, but for more complicated content, a device with a bigger screen (iPad or tablet) is required. The other manager thought that with *available data connectivity*, learners can access learning through *any device – a mobile phone, tablet, or laptop*.

The training managers felt mobile learning is a convenient and shorter mode of learning to address work-related problems just-in-time and is best capped at 10 minutes.

5.3.4 Key Objectives Being Sought in the Organisation

“For the user, mobile learning is very beneficial. More organisations will move towards mobile learning because of the convenience.” – Training Manager 1

Mobile learning is being considered in this organisation for wider reach, cost effectiveness, learning effectiveness, and convenience of use.

93% of staff thought mobile learning can reach “*many people, anywhere*” (Figure 5.5). Its effectiveness lay in its “*speed and reach*” and it is “*definitely beneficial to both the individual and the organisation*” (Training Manager 1). “*Anyone can use mobile learning to learn*” irrespective of their experience, rank, or age.

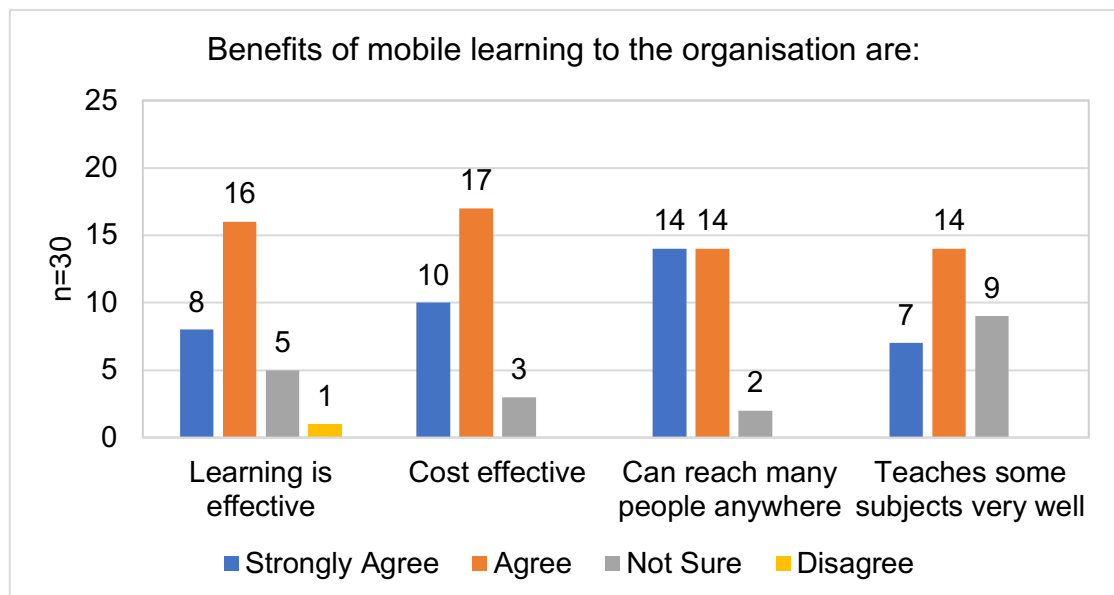


Figure 5.5 Benefits of mobile learning to the organisation

90% of staff thought the benefit of mobile learning “*is cost effectiveness*”, and 80% also thought its benefit is learning efficacy (Figure 5.5). One of the training managers felt it facilitates “*better execution, improved understanding, immediate application*”. While 70% agreed that it teaches some topics very well (Figure 5.5), both training managers felt it is not suitable for “*heavy learning*”, for example, human anatomy and physiology.

Mobile learning is considered effective in many areas and topics (Figure 5.6 and Table 5.1).

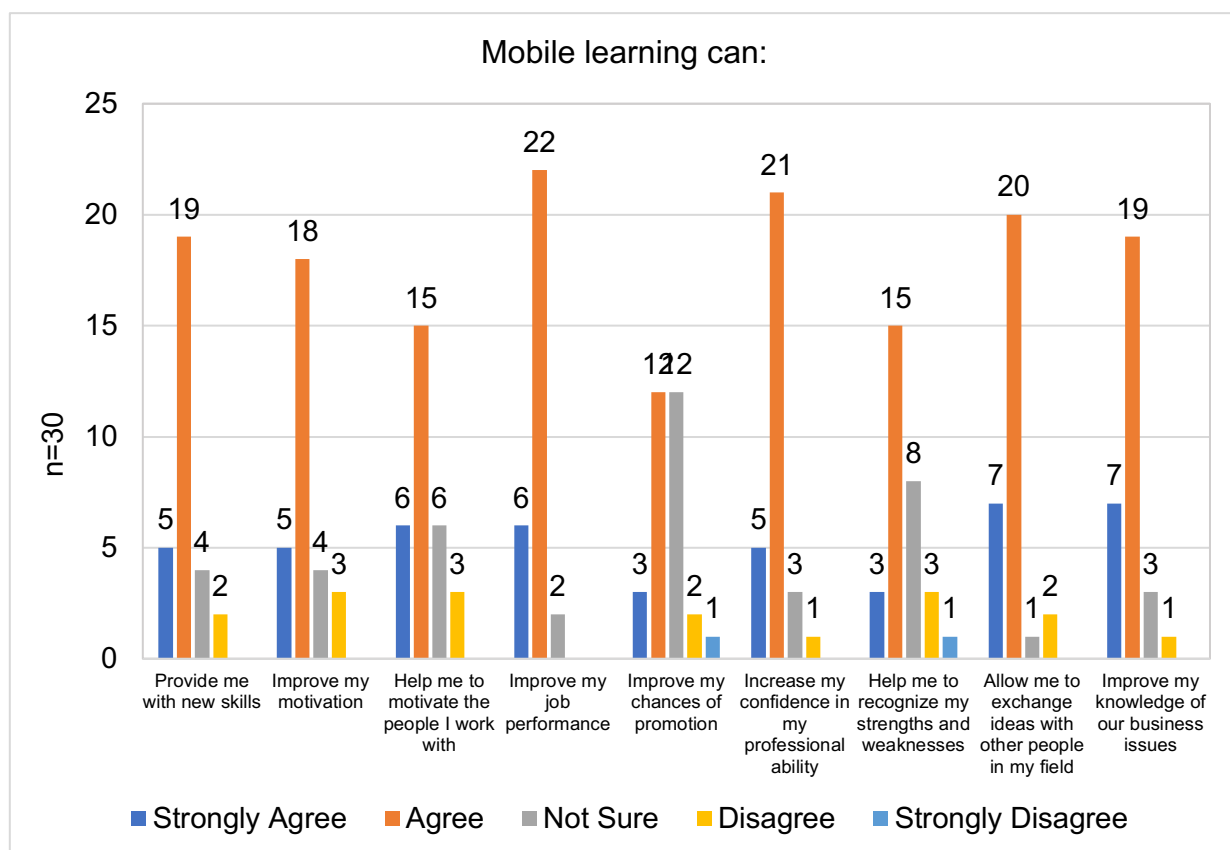


Figure 5.6 What mobile learning can do

Mobile Learning	% Responses from Staff
Inculcates new skills	80
Improves motivation	77
Helps motivate others	80
Improves job performance	93
Improves chances of promotion	50
Increases professional confidence	87
Helps identify strengths and weaknesses	60
Facilitates exchange of ideas	90
Improves business knowledge	87

Table 5.1 Effectiveness of mobile learning

Mobile learning overcomes the barriers of time, location, and inability to devote longer time to learning.

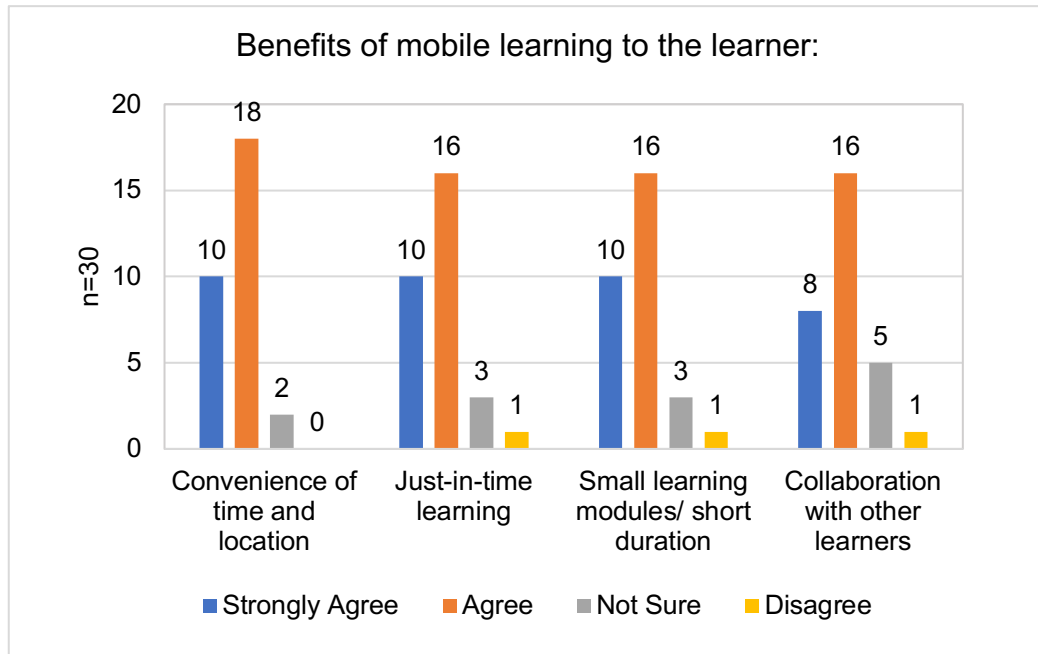


Figure 5.7 Benefits of mobile learning to the learner

While 93% of staff thought mobile learning offers the “convenience of time and location”, 87% equated convenience with “just-in-time learning” and with “small learning modules/ short duration”, 80% thought it is “collaborative” (Figure 5.7).

5.3.5 Mobile Learning Within the Framework of Sharples

5.3.5.1 Subjects

Mobile learning is suitable for “all kinds of learners.” – Staff and Training Managers

The ‘subjects’ are the staff/learners engaged in mobile learning – medical representatives and their senior colleagues.

The medical representatives are typically undergraduates in life sciences, chemistry, or pharmacy. About 10% are post-graduates and a few are doctors. The company, in recent times, has also been recruiting graduates from arts and humanities. Their jobs involve extensive travelling and a lot of waiting time – in doctors’ chambers, hospitals, and bus and train stations.

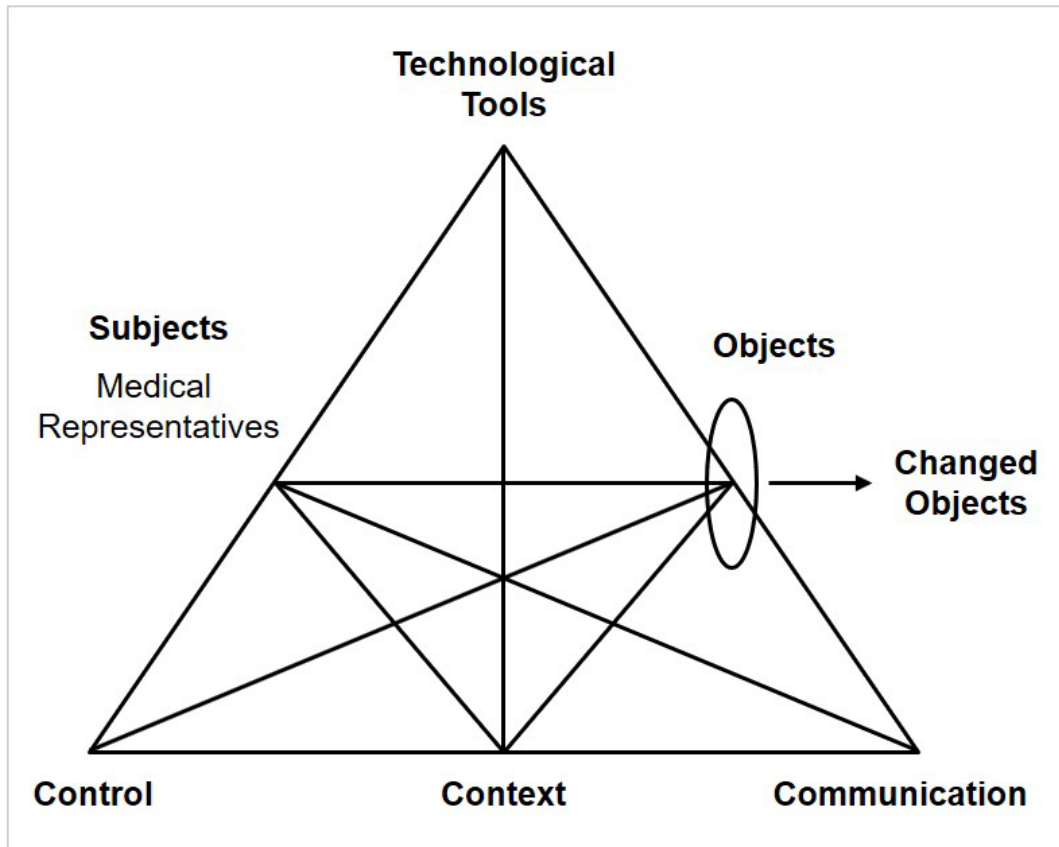


Figure 5.8 Mobile Learning within Sharpley's Framework at ABT – Subjects

Both the training managers and most of the staff did not agree that mobile learning is suitable only for a particular type of learner; they felt mobile learning has a much broader applicability.

77% of staff agreed with the training managers that mobile learning is suitable for “all kinds of learners”, not only millennials, white-collared or management staff, or those with prior experience in e-learning (Figure 5.9).

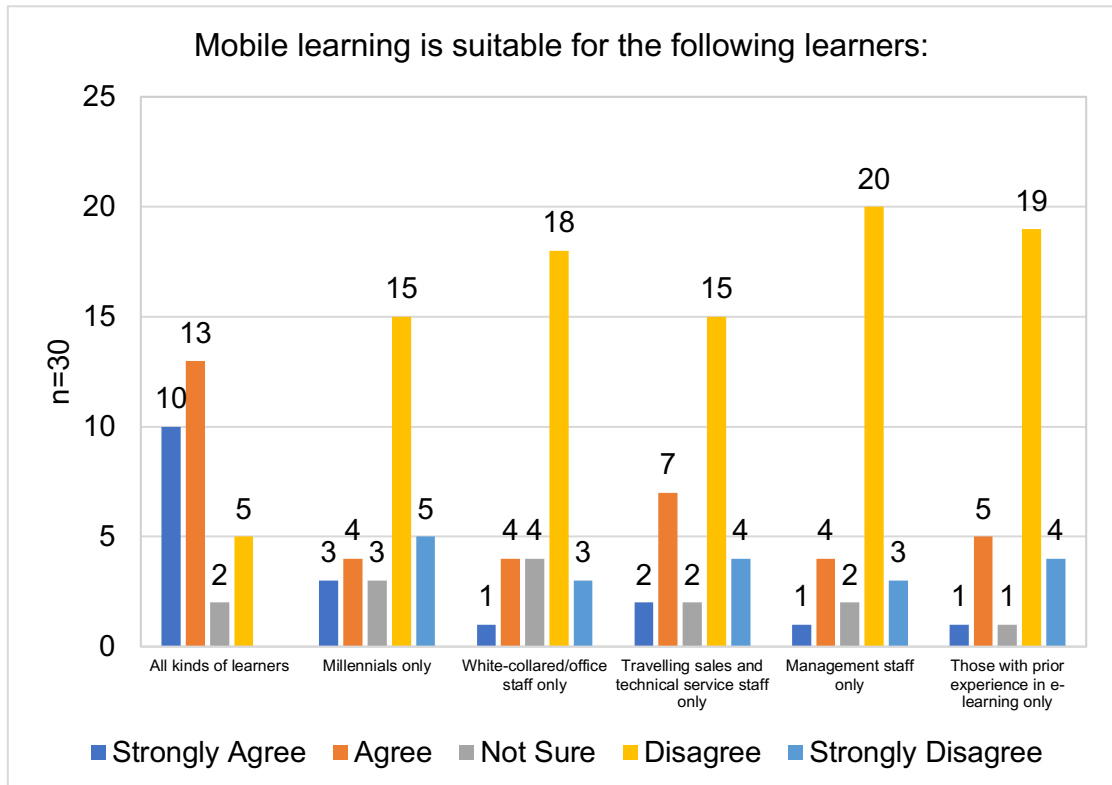


Figure 5.9 Mobile learning is suitable for specific type of learners

5.3.5.2 Objects

Mobile learning is suitable for “all kinds of topics.” – Staff

Mobile learning for soft skills training is “not a good idea as classroom is more suitable.” – Training Manager 1

The objects of mobile learning are ‘Refresher training’ and ‘Just-in-time’ performance support.

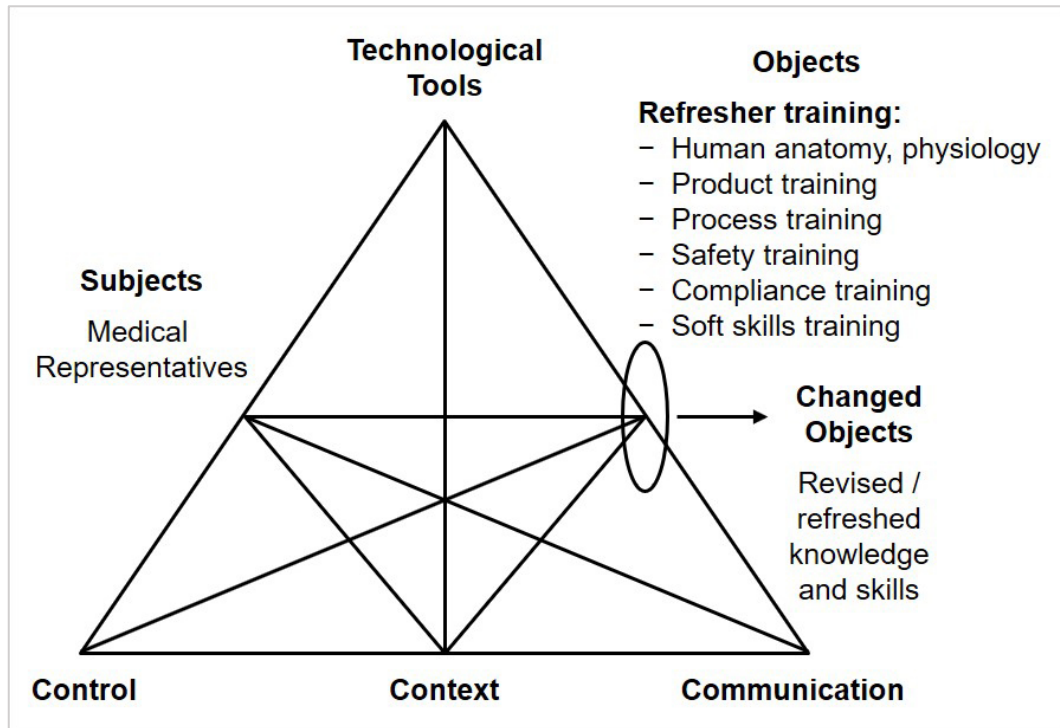


Figure 5.10 Mobile Learning within Sharple's Framework at ABT – Objects

Mobile learning generally builds on the primary 30-day onboarding classroom training provided for fresh graduate recruits, conducted continually as fresh graduates are regularly recruited.

The topics covered in the primary onboarding training can be categorised into:

- a) Knowledge base: Human anatomy, physiology
- b) Product training: The company's products (drugs), their chemical composition, action and efficacy, and how they compare with competitor products
- c) Process training: Work-related processes, documentation, reporting, software tools

-
-
- Work processes: Sales Processes, Reporting Processes, Stock Requisition Processes
 - Software application processes: Salesforce, a Customer Relations Management (CRM) software, SumTotal (LMS)

d) Safety training

e) Compliance training

f) Soft Skills training: Communication, selling, negotiation

Mobile learning is primarily used to deliver 10-15-minute 'refresher' training on the knowledge base and products, to reinforce and refresh existing knowledge, and to serve as just-in-time reference before facing a customer or competitor.

Although the staff readily agreed that mobile learning is suitable for any topic, the training managers believed topics requiring serious study were better suited for classroom training, with mobile learning better suited for topics that can be understood or refreshed quickly, and the learning applied to solve problems at the place of work.

Most of the staff believed e-learning (83%) and mobile learning (77%) can teach any topic (Figure 5.11 and Figure 5.12).

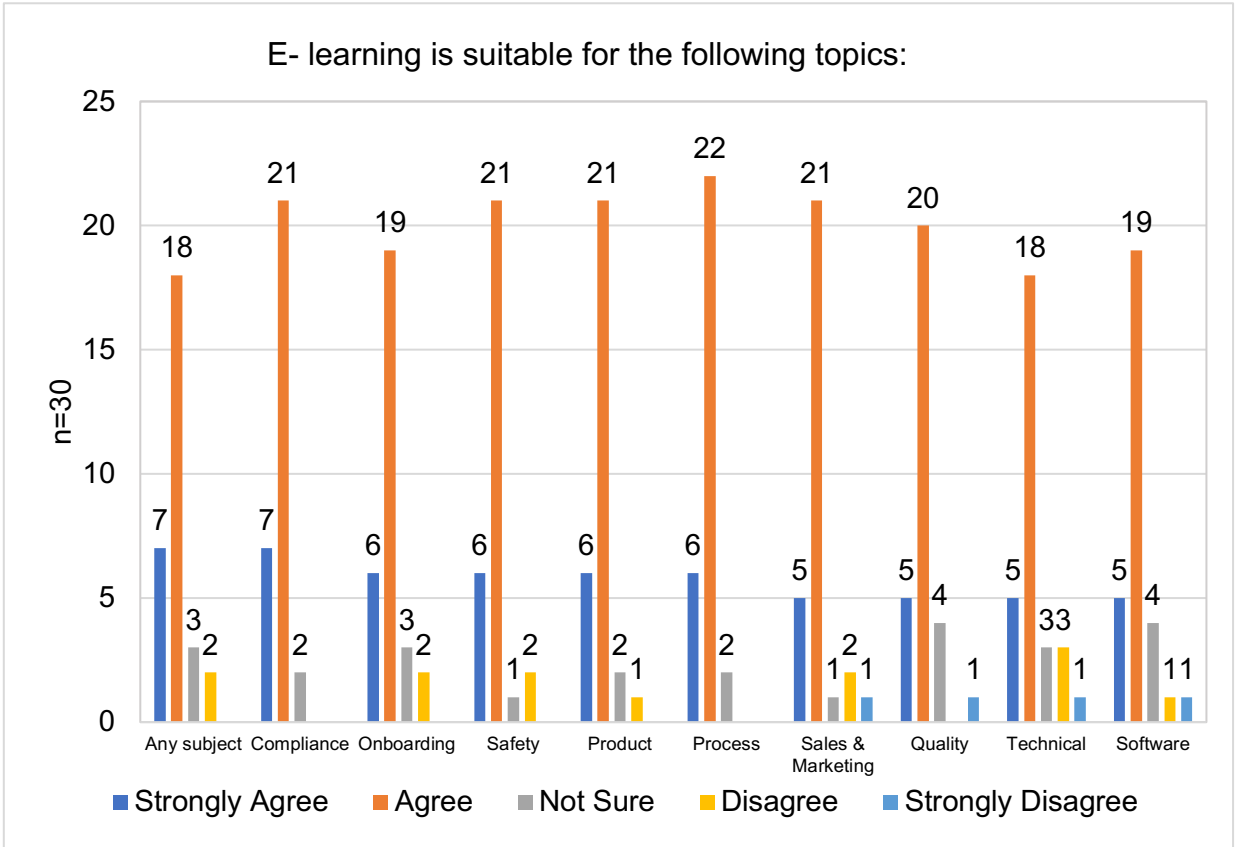


Figure 5.11 E-learning is suitable for stated topics

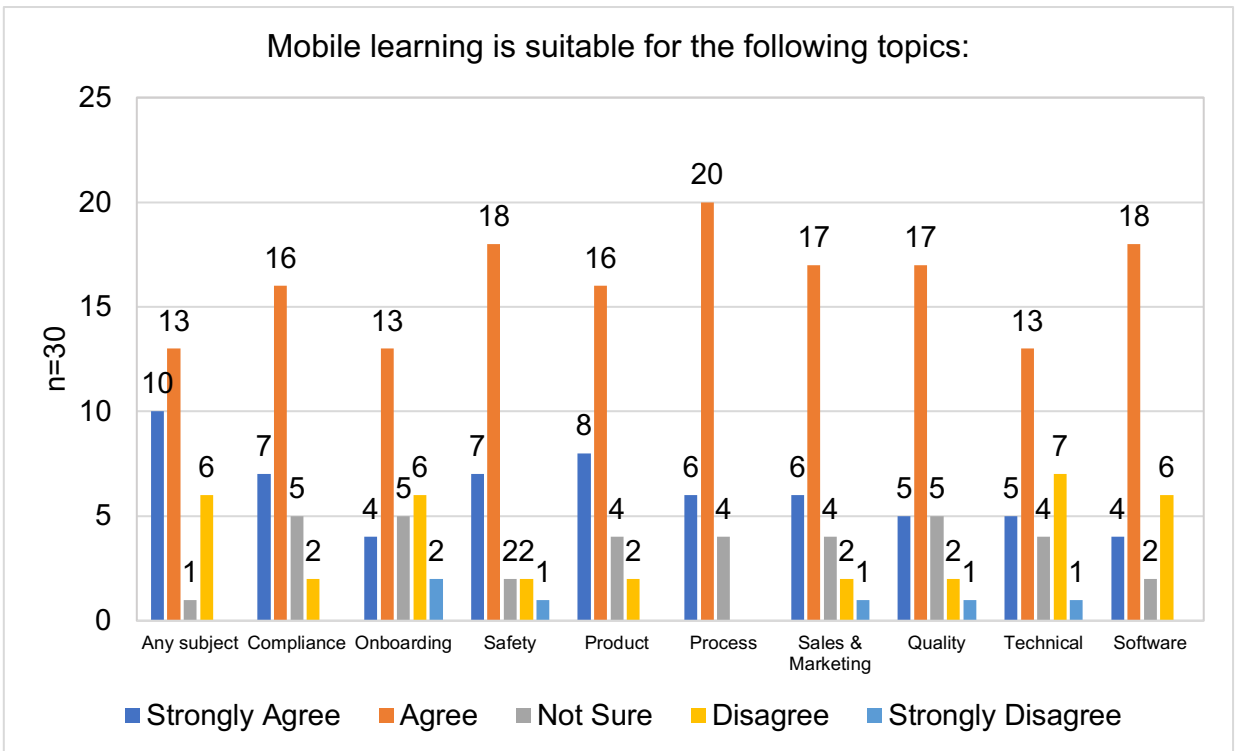


Figure 5.12 Mobile learning is suitable for stated topics

80% of staff believed mobile learning is suitable for product training, but the training managers felt mobile learning would be more suitable for refresher training on the products.

While 87% of staff believed process training can be taught through mobile learning, 83% believed safety training can be done through mobile learning, and 77% believed compliance training can be done through mobile learning (Figure 5.12).

Although 77% of the staff believed mobile learning can be used for sales skills training, the training managers disagreed. While one training manager believed the classroom is more suitable for soft skills training, the other felt mobile is “fairly effective”.

5.3.5.3 Technological Tools

“Today most of the organisations are moving towards iPads and tablets.”
– Training Manager 1

The company hosts large volumes of digital information – PowerPoint decks, PDFs, infographics, videos and podcasts – on its servers and LMS, to serve as refresher training or just-in-time reference material.

As the company does not provide laptops, medical representatives used to visit nearby cyber (Internet) cafes to access the company's LMS, websites, and servers while travelling. Now-a-days, with the advent of smart phones and improved Internet services in India, they use their mobile devices to access their emails and Internet.

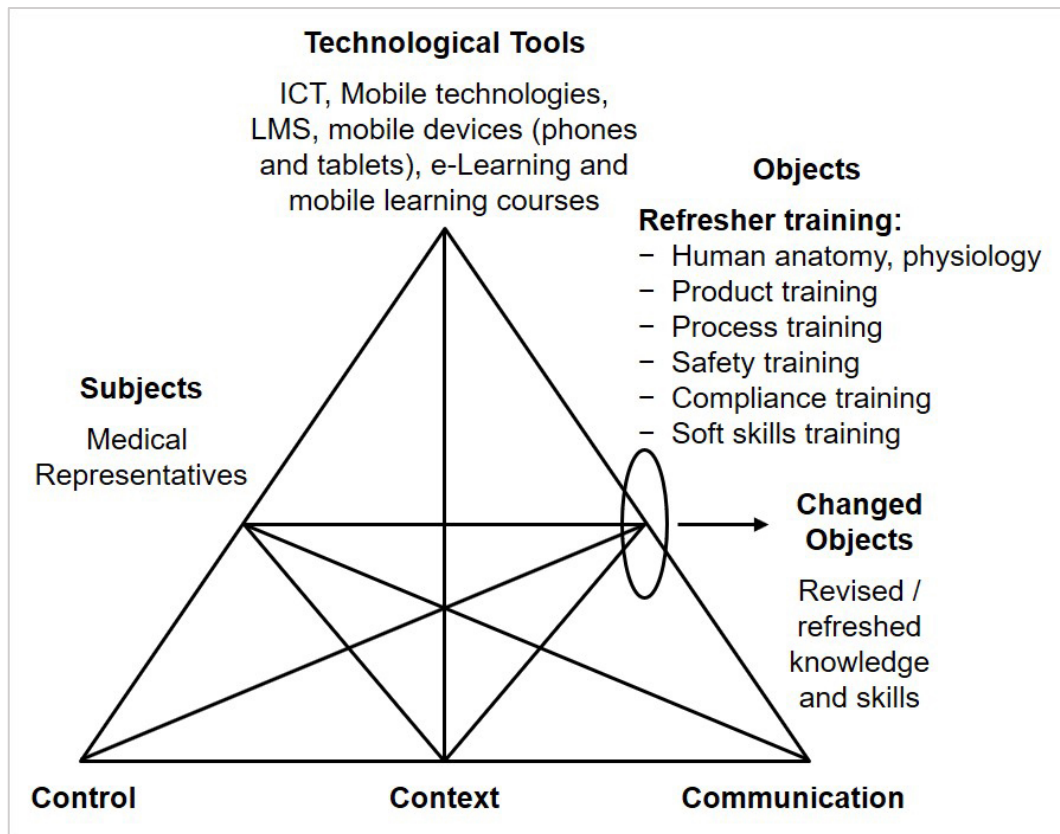


Figure 5.13 Mobile Learning within Sharple's Framework at ABT – Technological Tools

Both staff and training managers thought the tablet is the most appropriate mobile device (hardware) for mobile learning, though smart phones also could be used (Figure 5.14).

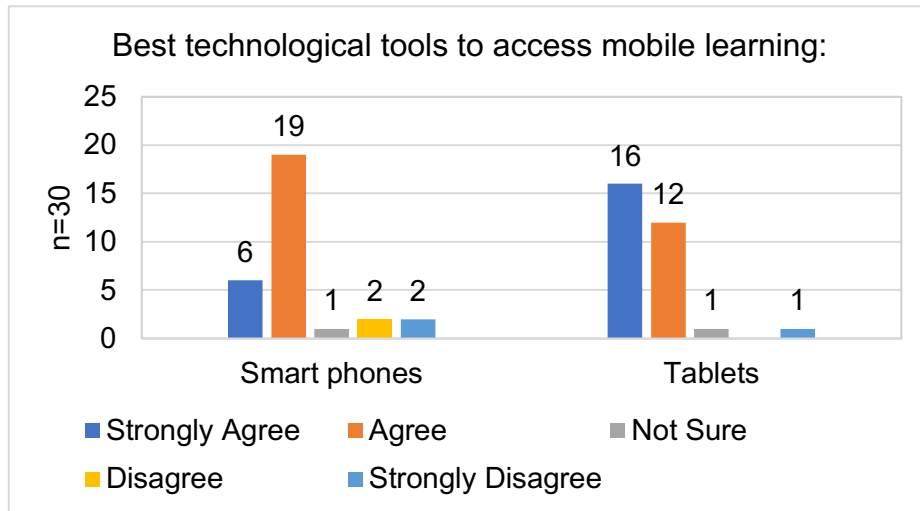


Figure 5.14 Best technological tool to access mobile learning

5.3.5.4 Context: Community and Locations

“The main community of mobile learning in this organisation is the sales personnel.” – Training Managers

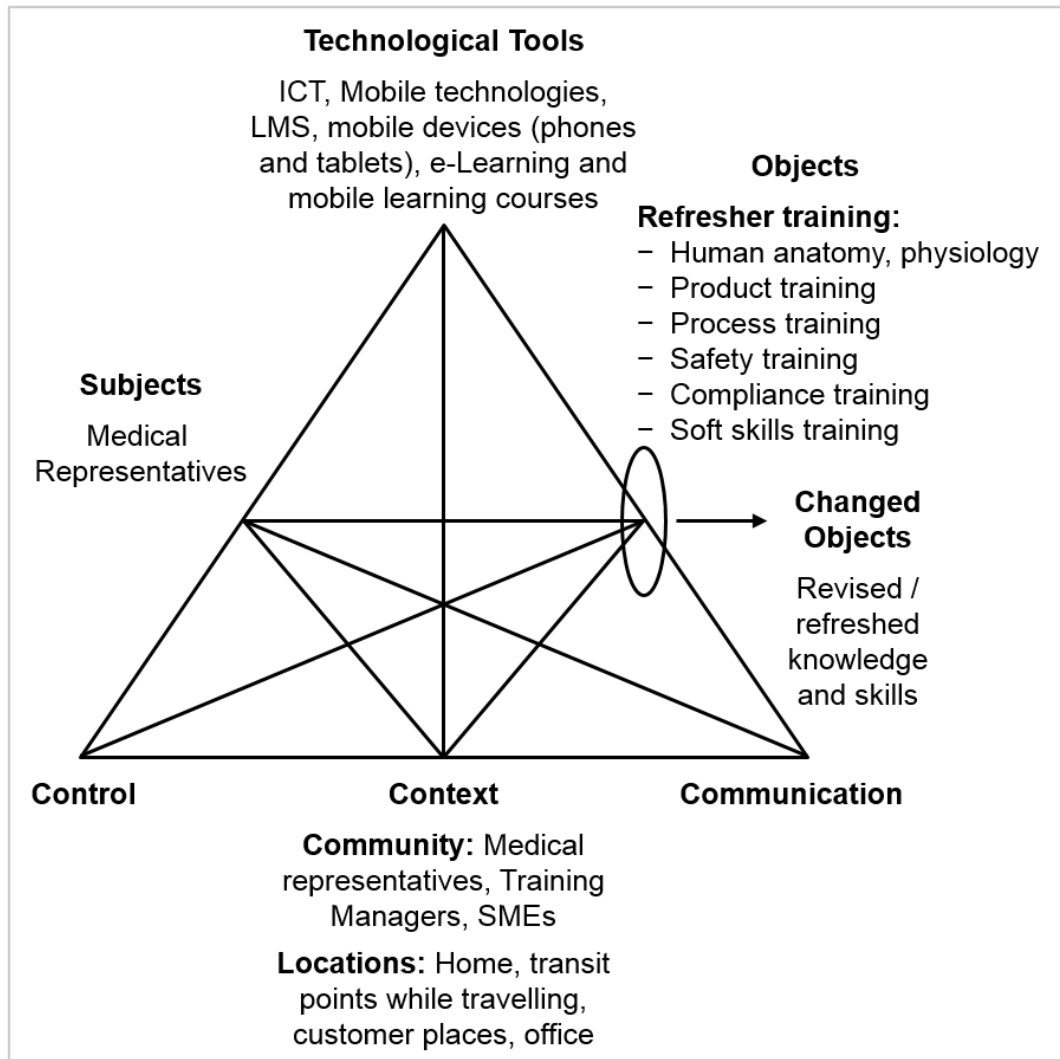


Figure 5.15 Mobile Learning within Sharpley's Framework at ABT – Context

Community

Although sales personnel are the main community for mobile learning, other stakeholders such as training managers and subject matter experts (SMEs) also form part of the mobile learning community in this organisation.

- a) Learners (staff) are the medical representatives who actually sell at the frontline.
- b) Subject Matter Experts (SMEs) from the product development, R&D and medical validation departments are involved in developing course content and may also act as classroom trainers.
- c) Training managers are responsible for training the marketing and sales staff.

Locations

Both types of participants agreed that the locations of mobile learning are varied – homes/hotels, office, airports/bus stations, customer reception rooms, and places of recreation.

The staff's ideal locations for mobile learning are home (90%) and transit points (83%) (Figure 5.16).

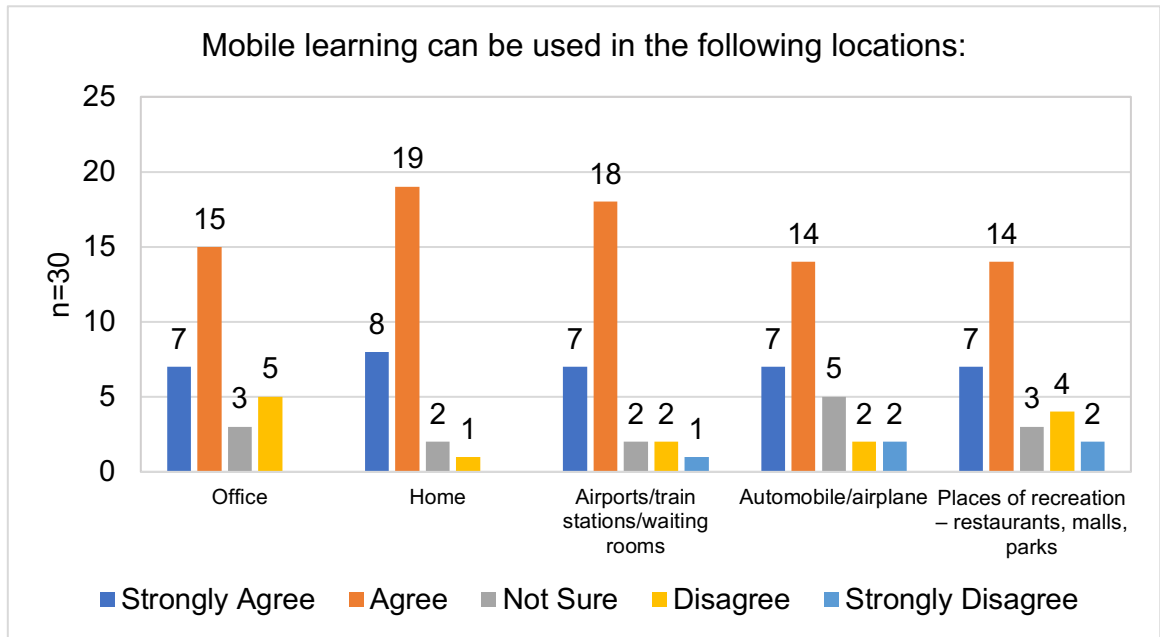


Figure 5.16 Best locations for mobile learning

The training managers' preferred location of learning is the place of work (waiting rooms of a clinic or hospital). They believed that staff should also be able to access learning while travelling to meet a customer or waiting for one, to refresh specific information pertaining to that customer or situation.

5.3.5.5 Control: Technological Restrictions and Social Rules

“One of the biggest barriers to the adoption of mobile learning is the thought that learning happens only in classrooms. The top management are still not convinced that mobile learning will be a hit.” – Training Manager 1

Usability limitations of mobile devices and Internet bandwidth issues were seen as the primary restriction. (Note: The situation has hugely improved since this interview.)

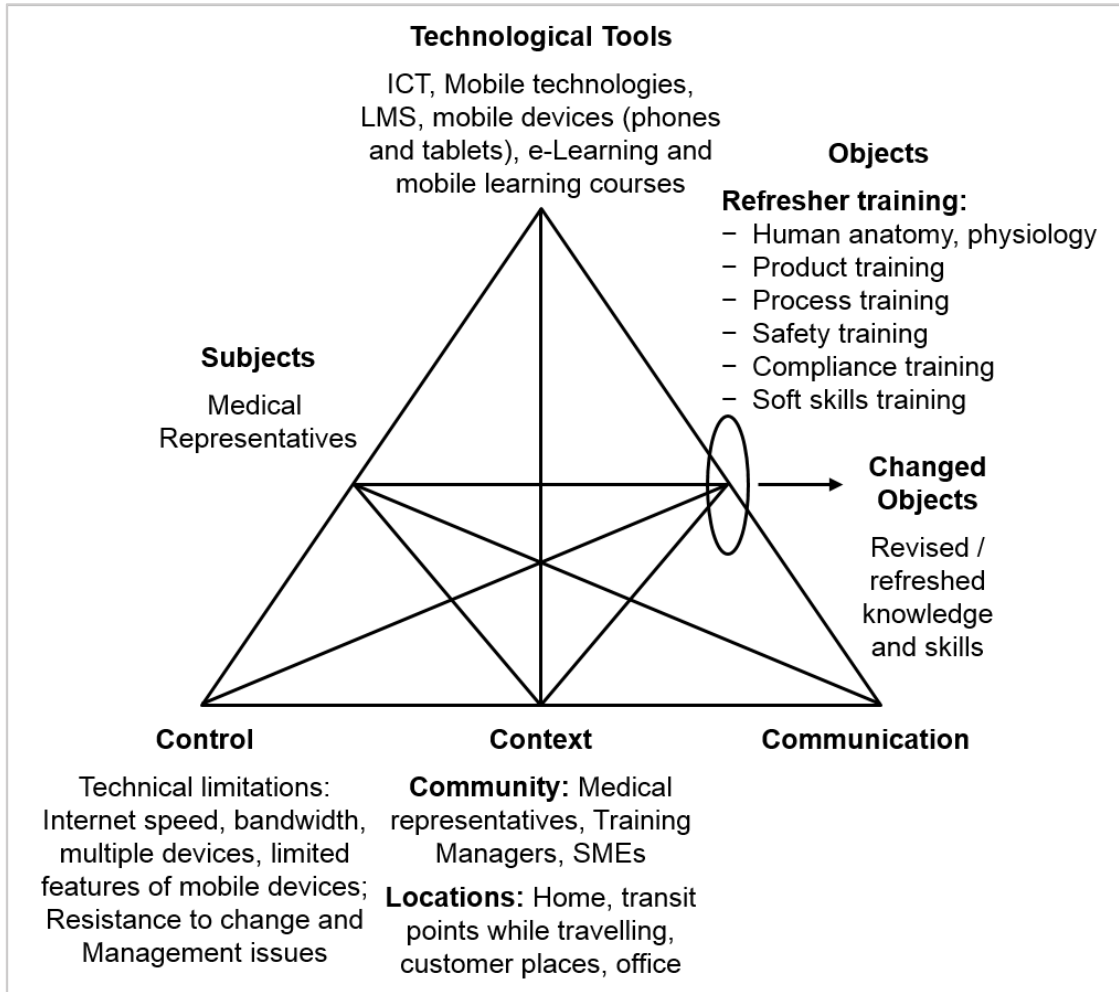


Figure 5.17 Mobile Learning within Sharple's Framework at ABT – Control

The restrictive IT security protocols for accessing servers through mobile phones were also considered important, as were the challenges of designing mobile learning for multiple devices, financial/budgetary constraints and resistance from stakeholders.

The staff's views on the main restrictions for mobile learning are as listed below (Table 5.2)

Barriers to Mobile Learning	% Responses from Staff
IT Security issues	83
Financial/budget constraints	60
Psychological resistance of stakeholders	60
Technology issues (e.g. multiple devices)	67
LMS issues (tracking)	53
Usability limitations of mobile devices (screen size, Flash incompatibility)	87
Internet bandwidth issues	87

Table 5.2 Barriers to mobile learning as per staff

Technological Restrictions

One of the biggest barriers to mobile learning is “Internet bandwidth Issues” – Staff and Training Managers

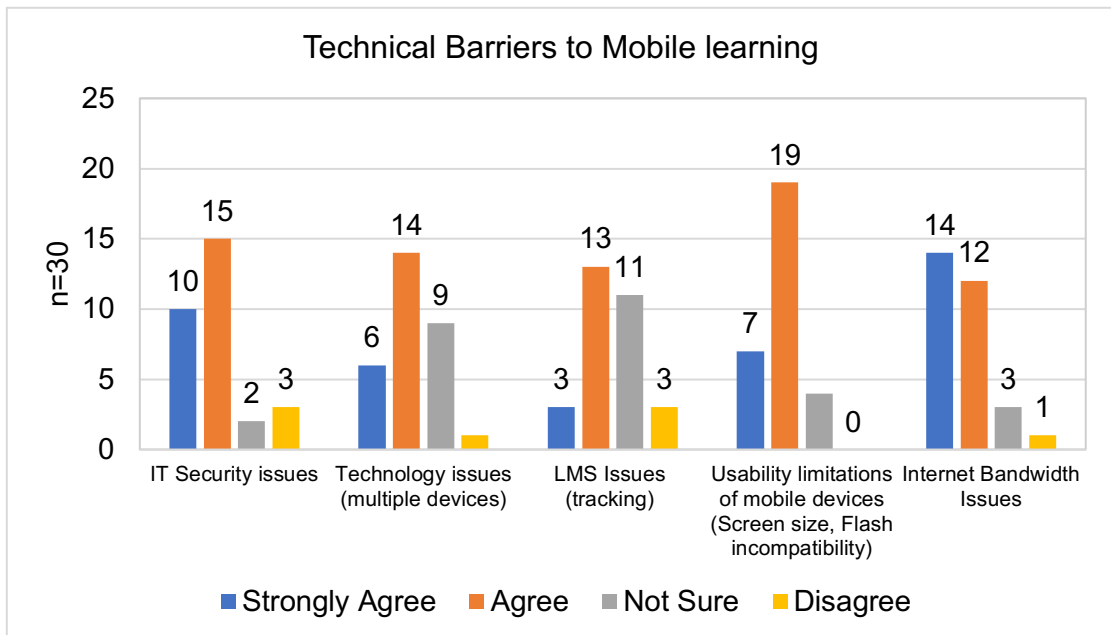


Figure 5.18 Technical barriers to mobile learning as per staff

Internet Bandwidth Issues

Internet Bandwidth issues were the top concern for both type of participants, with 87% of staff considering it one of the biggest barriers to mobile learning (Figure 5.18).

The training managers agreed that ICT technology is one of the biggest hurdles, especially in India with its modest Internet speeds and limited access. One of them believes Internet bandwidth will improve, paving the way for full-fledged adoption of mobile learning along with mobile apps.

IT Security Issues

Opinion is divided on IT security issues, with 83% of the staff thinking it is an issue (Figure 5.18), while the training managers did not.

Technology Issues (Multiple Devices of Learners)

While both training managers and 67% of staff agreed that using multiple devices is a barrier to mobile learning, 30% were not sure (Figure 5.18).

One of the training managers believed the BYOD (Bring Your Own Device) policy of the company would hinder the adoption of mobile learning because not all employees possess the right device. The other manager felt providing a uniform mobile device to all learners would promote mobile learning.

Usability Limitations of Mobile Devices

Both staff and training managers believed the limited features of mobile devices were a hindrance to mobile learning.

87% of staff believed that usability limitations of mobile devices (screen size and inability to play Flash) were barriers to mobile learning (Figure 5.18).

The training managers talked about tweaking the content to fit the screens of different mobile devices. (Note: At the time of this interview, responsive and adoptive design technology was at a nascent stage).

LMS Issues

Though about half the staff felt LMS issues posed a barrier to mobile learning (Figure 5.18), the training managers thought the LMS did not pose a significant problem for mobile learning.

Social Rules

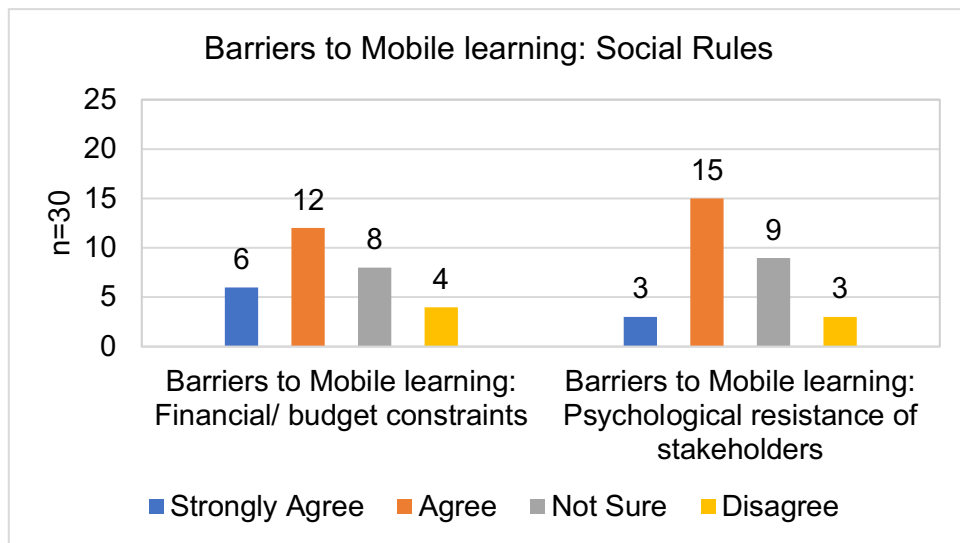


Figure 5.19 Barriers to mobile learning – social rules

Leadership Support

Leadership support is perceived important for the success of mobile learning, with 60% of staff believing senior management’s restrictions on budgets for mobile learning to be an issue (Figure 5.19).

The training managers felt leadership commitment is important for mobile learning as it requires substantial financial investment. They believed that though their leadership was more positively inclined towards mobile learning than previously, they were still not totally convinced about its return on investment.

Resistance to Change

Though 60% of staff believed psychological resistance of stakeholders is a barrier to mobile learning, 40% were not sure or disagreed (Figure 5.19).

The training managers felt it was a challenge convincing the SMEs to customise the “scientifically perfect” but voluminous content into a learner friendly version.

The training managers (who used to believe only in classroom training) now believe they should become more learner-centric, considering the variety of mobile devices in which the course would be delivered.

According to the training managers, staff have an inherent bias against classroom or e-learning because of the hours required. They believed shorter mobile learning would solve an immediate problem for them without much effort.

5.3.5.6 Communication: Channels and Conversations

Mobile learning is considered suitable only for individual, asynchronous learning.

“We are in the process of introducing community learning but have not even cracked the surface.” – Training Manager 1

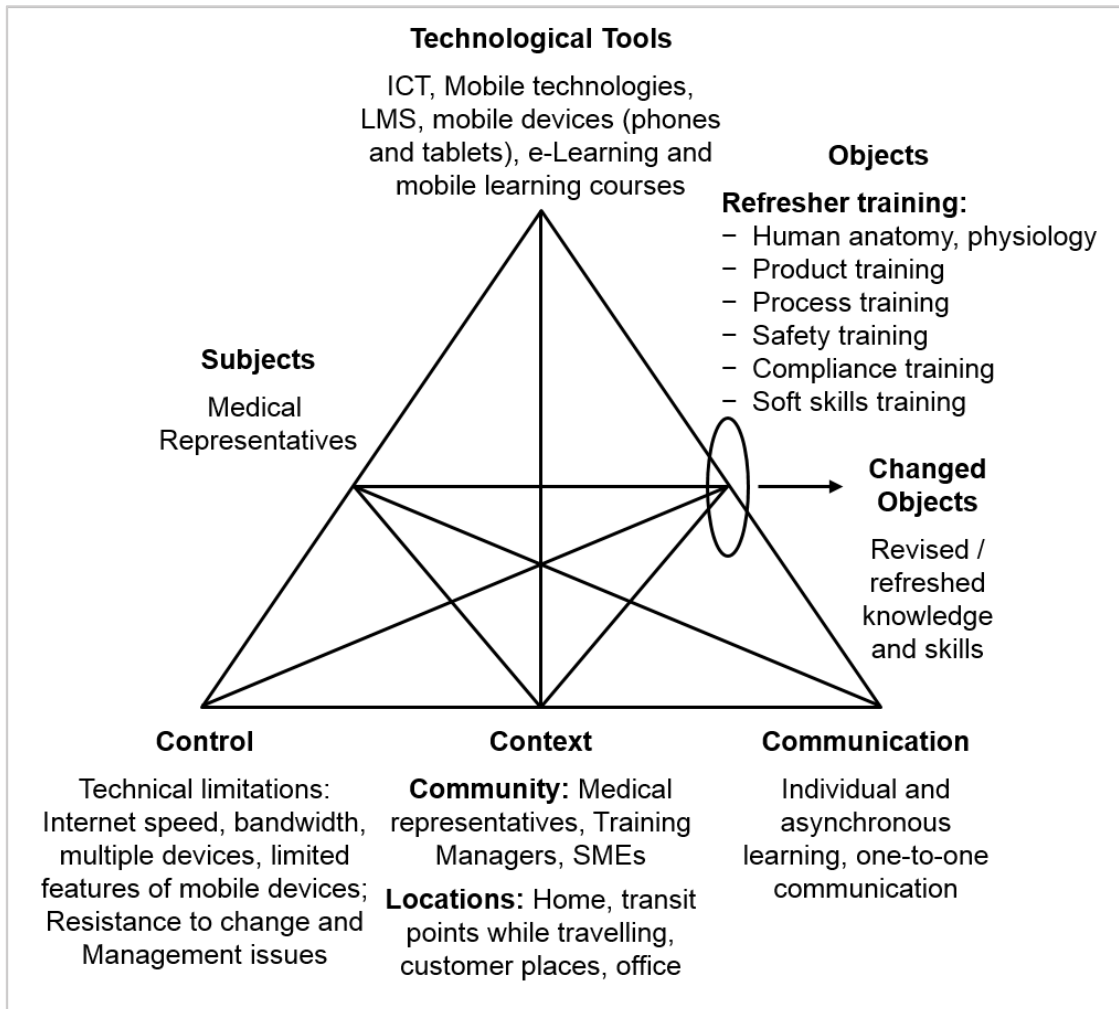


Figure 5.20 Mobile Learning within Sharple's Framework at ABT – Communication

Most staff (83%) thought mobile learning was good for individual and asynchronous learning. Only 47% thought it could be used for collaborative learning (Figure 5.21).

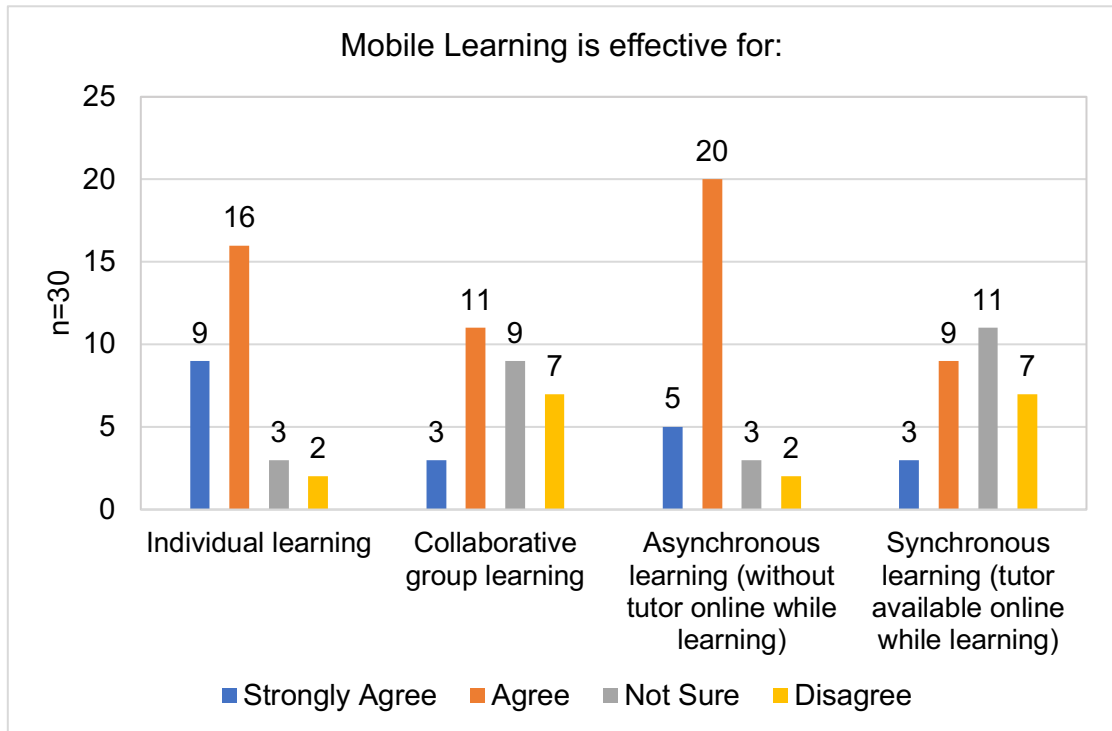


Figure 5.21 When is mobile learning effective?

Though the training managers were unable to visualise how mobile learning will be collaborative, they considered an online discussion forum facilitating collaboration a good idea. They also thought leadership badges and gamification on LMS could encourage collaborative learning.

5.3.6 Mapping Mobile Learning Activity

The following is the mobile learning activity mapped on Mike Sharples' Framework.

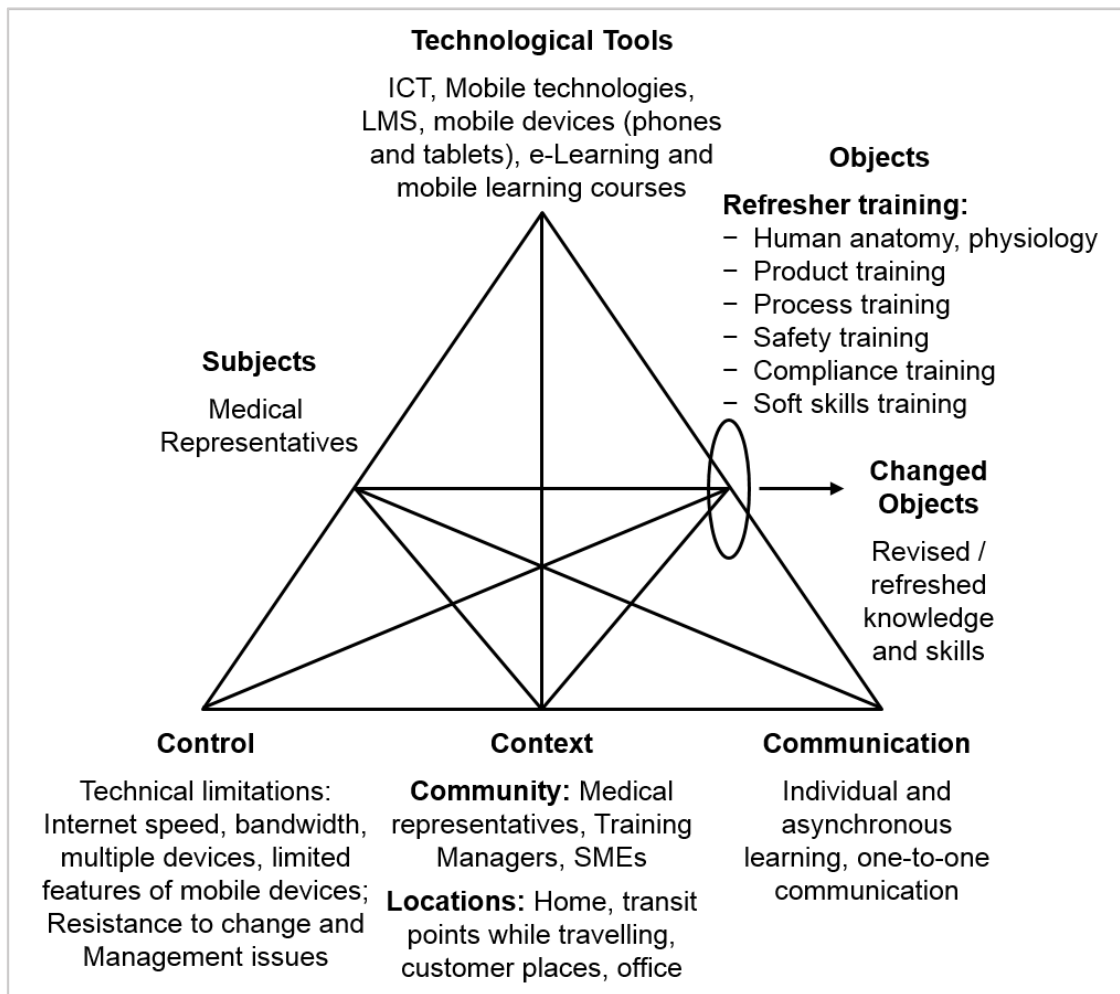


Figure 5.22 Mobile learning activity at ABT mapped on Mike Sharples' framework

Subjects: The primary subjects are medical representatives, both fresh recruits and experienced ones.

Objects: The objects are refresher training on the knowledge base in human anatomy and physiology, product training, and process training. Changed objects are the revised knowledge and skills of experienced medical representatives whose feedback goes into revising the objects. However, in the absence of interactions with and contributions from learners, the objects did not evolve, and hence were not revised.

Technological Tools: Technological tools include Internet, communication and mobile technologies, LMS, mobile devices (phones and tablets), e-learning, and mobile learning courses.

Controls: Controls include Internet speed, bandwidth limitations, difficulty in managing content on multiple devices, device limitations, resistance to change, and management issues.

Context: Context includes locations and community.

- **Locations:** Learners' homes, transit points (while travelling to customers), or customer places
- **Community:** Medical representatives along with other sales professionals (training managers and SMEs)

Communication: Communication is primarily one-on-one among individual learners or between a learner and SME.

5.3.7 Tensions in Mobile Learning Activity

A few tensions were identified during the study between the elements of the Sharples' framework. Important ones are described below.

5.3.7.1 Subjects (learners) vs. Technological Tools

Most learners felt that the ideal mobile learning device was a tablet, followed by smartphones. The BYOD policy of the company created a high degree of tension between the staff and the mobile learning activity. This was because multiple devices were in use though the LMS content had been designed for devices quite different from those they were using, causing usability issues. Learners also felt that low Internet speeds, bandwidth issues, device limitations, and more general problems with LMS navigation led to issues in accessing learning when needed.

5.3.7.2 Subjects vs. Objects

There is a tension between what the staff and training managers felt about objects. While most staff felt mobile learning was suitable for any kind of topic, the training managers thought new topics and "serious and heavy" topics requiring undisturbed study were better addressed in the classroom, and that mobile learning was best suited for topics that could be understood and/or revised quickly to solve workplace related problems (refresher training). Also, the staff felt soft skills training is possible with mobile learning, but the training

managers did not agree and were not planning on providing such training via mobile learning.

So, in actual practice, mobile learning objects were restricted to small, relatively easy to assimilate “nuggets”. Lengthier topics were reserved for e-learning and classroom training, with mobile learning confined to refresher training rather than building new and substantial knowledge and skills.

5.3.7.3 Subjects vs. Controls

Most learners, although very positive about mobile learning, felt the constraints for its adoption included both the technological limitations already referred to above (*section 5.3.5.5*) such as usability limitations of mobile devices (screen sizes and inability to play Flash), Internet speed and bandwidth issues, multiple devices, as well as stakeholders’ resistance to change and management issues.

5.3.7.4 Subjects vs. Communication

Learners were predominately self-learning, communicating primarily with the objects and technological tools and not among themselves. They are yet to experience collaborative communication and learning between other learners and SMEs, in real time or even asynchronously, although the potential for collaboration with other learners was acknowledged by them as indicated by their responses on whether mobile learning enabled collaboration with other

learners. The training managers on the other hand, though unable to visualise how mobile learning could be collaborative, felt that an online discussion forum and a gamified LMS could foster collaboration. There is clearly a difference here between the stated beliefs of respondents and the actual practices in the organisation.

5.4 Case Report 2: PCI

5.4.1 Background

5.4.1.1 Brief Profile of the Company

According to the company's website, PCI (a pseudonym) is the world's largest personal computer manufacturer as of March 2019, with operations in more than 60 countries. It designs, develops, manufactures and sells personal computers, tablets, smartphones, workstations, servers, electronic storage devices, IT management software, and smart televisions.

According to its 2018-19 annual report, training and development of employees at PCI begins with 'New Employee Orientation' and follows the 70-20-10 model – 70% on-the-job training, 20% coaching and mentoring, and 10% coursework and training.

Most training happens for sales and service personnel. For this study, data was collected from two (2) training managers, and twenty-one (21) sales and service personnel across the world.

5.4.1.2 About Mobile Learning in PCI

According to the training managers, though most of the training happens in the classroom, PCI has been using e-learning effectively for 15 years.

As the company expanded into APAC countries, specifically Russia and India, the limited access to laptops/desktops and weak Internet infrastructure motivated the company to experiment with mobile learning.

5.4.2 Relationship to Established E-learning Provision

“Mobile learning is content that either calls me to reflect on something that I just read or something that I need to look up to use immediately as a piece of reference information.” – Training Manager 2

The relationship with established e-learning provision is seen to be a close one by most respondents when it comes to mobile learning being a part of e-learning and NOT an entirely new way of learning. The points of difference between the two are stated to be in the location of learning, type of device used, and the kind of content presented. The relationship with established e-learning provision is NOT seen to be a close one when it comes to mobile learning being the same as e-learning.

The training managers believed e-learning and mobile learning were very different, with *“all the extra development efforts that need to be applied in the*

front end” with mobile learning (Training Manager 1). The second training manager thought e-learning and mobile learning were “*mutually exclusive*”, “*almost like content curation versus course creation*”. He also felt that though an e-learning course could be deployed on a mobile device, the staff would be frustrated with its duration.

Though both respondents (training managers and staff) thought there is no close relationship between e-learning and mobile learning, 81% considered mobile learning a part of larger e-learning but about 86% did not agree that they are the same (Figure 5.23).

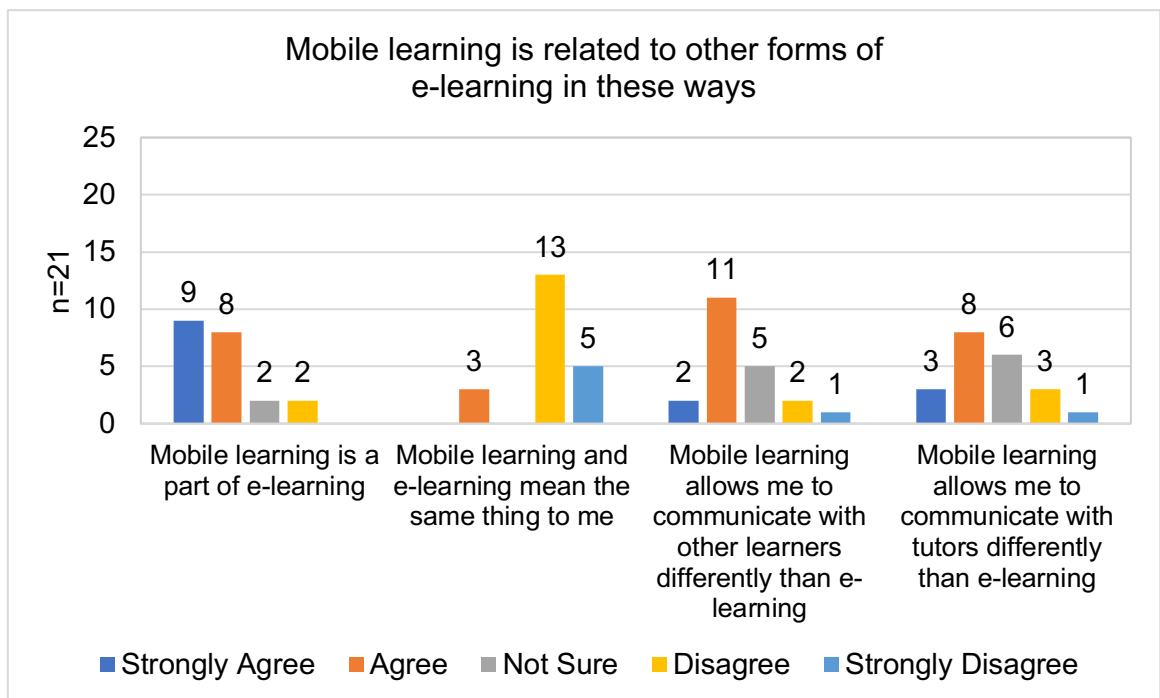


Figure 5.23 Relationship to Established E-learning Provision (a)

According to one of the training managers, the goals of e-learning and mobile learning were very different; e-learning is better for “*deeper understanding*” of

the content, but when it came to mobile learning, videos worked well in their mobile app solution, more of “*content curation*”.

Comparing mobile learning with e-learning, 62% of staff felt mobile learning allows learners to communicate with other learners differently, while 52% also believed mobile learning allows them to communicate differently with their tutors (Figure 5.23).

57% thought mobile learning offered a greater range of technologies to access content, and 95% thought they could access learning content from more locations (Figure 5.23).

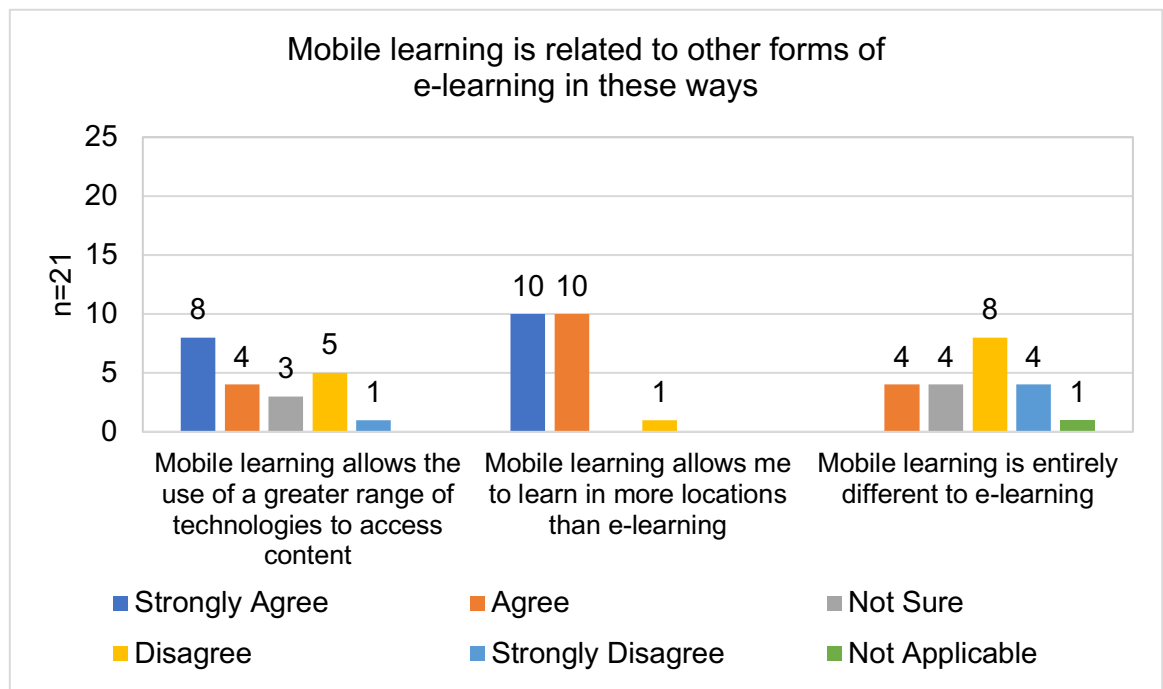


Figure 5.24 Relationship to Established E-learning Provision (b)

Both training managers and staff thought mobile learning is NOT entirely different to e-learning. 57% of the staff did not agree that mobile learning is entirely different, only 38% thinking it is (Figure 5.24). One of the training managers felt that although both shared the same concepts, there were differences.

5.4.3 Key Aspects of Mobile Learning

Mobile learning is “learning on any device” – Staff

“We develop mp4 files, videos you can view on a device. And we included this as a mobile learning initiative, not designed as mobile learning per se.”

– Training Manager 1

The key aspect of mobile learning, according to the participants, is that learning happens while the learner is mobile, using any mobile device.

71% of staff equated mobile learning with “*learning through a mobile phone, while on the move*” (Figure 5.25). One of the training managers stated, “*The way we define mobile learning today is the ability to view learning on a mobile device, be it a tablet, or a phone*”. However, the other training manager said mobile learning has more to do with the type of content and the device than with the location or circumstance. In fact, he went on to say that the goal of the learning determined the format.

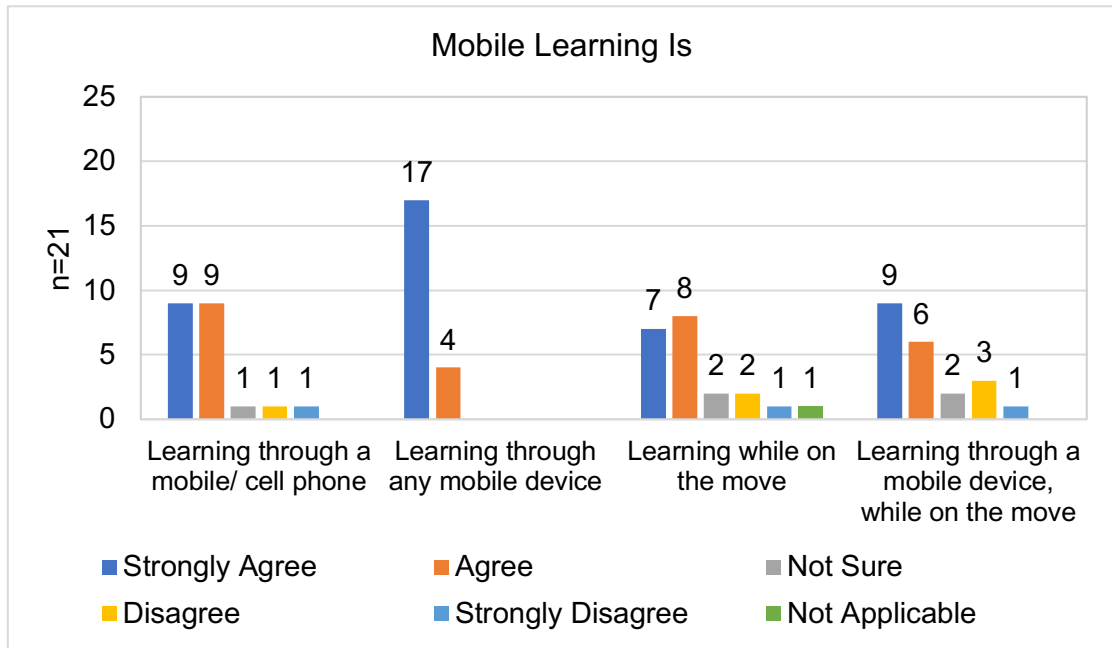


Figure 5.25 Key Aspects of Mobile Learning

86% of staff thought mobile learning is “learning through a mobile phone”, while ALL of them thought it is “learning through any mobile device” (Figure 5.25). One of the training managers believed mobile learning has “to be device agnostic and digestible”. He differentiated mobile learning more by the nature of content delivered than any other consideration – “when I have a tablet or phone in my hand, I am much more inclined to want information faster in a shorter format. With a laptop or desktop, I tend to be okay with having a course format”. The other training manager concurred with the staff in defining mobile learning as learning on a mobile device, whether a tablet or a phone.

Mobile learning of short duration is seen as a convenient mode of learning to address work-related problems, just-in-time, when the staff needs access to certain information on the job.

5.4.4 Key Objectives Being Sought in the Organisation

“You can save business time, money and enable staff to focus on what they are really supposed to focus on.” – Training Manager 1

Mobile learning is used in this organisation to reach more people (especially where e-learning is difficult to deliver), for application-based learning at the point of need, and cost effectiveness. Both training managers and staff felt mobile learning is very beneficial for the individual and the organisation in terms of reach and cost.

Most staff (95%) thought mobile learning could reach “*many people, anywhere*”, and 67% felt it is cost effective (Figure 5.26).

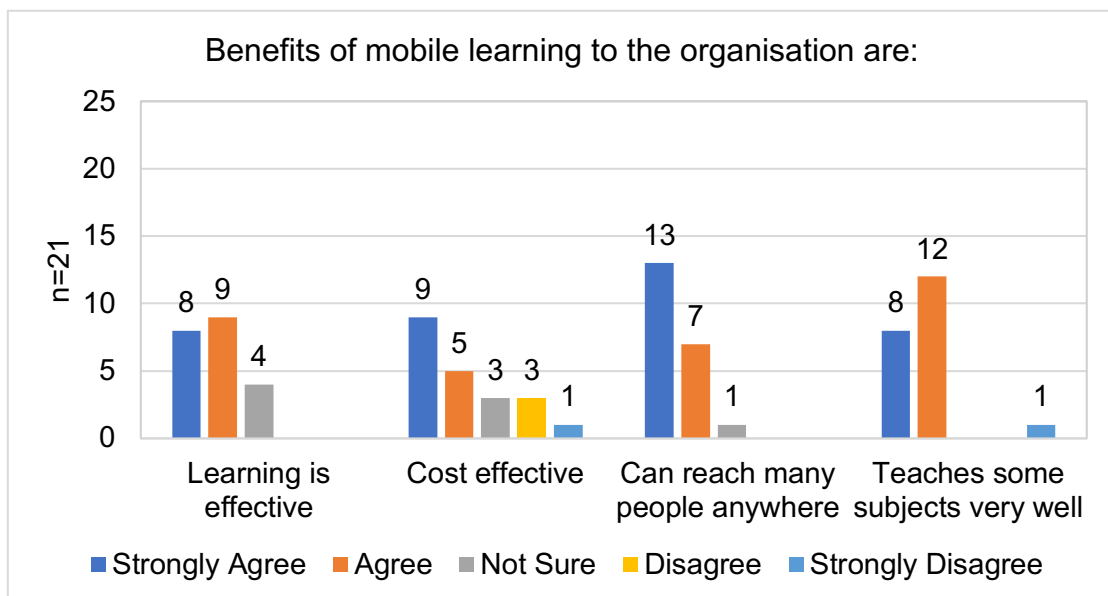


Figure 5.26 Benefits of mobile learning to the organisation

81% of staff thought mobile learning is effective (Figure 5.26), as “there is no extraneous information to sit through to find what they really needed”.

However, one of the training managers strongly felt its effectiveness had more to do with the type of market, for example, emerging markets where people who do not have computers or Internet access, might have access to a cell phone. 95% of staff thought it “teaches some subjects (topics) very well” (Figure 5.26).

Mobile learning is considered effective in many areas to the individual learner (Figure 5.27 and Table 5.3), providing new skills, improving motivation, helping to identify strengths and weaknesses, enabling exchange of ideas, and improving business knowledge.

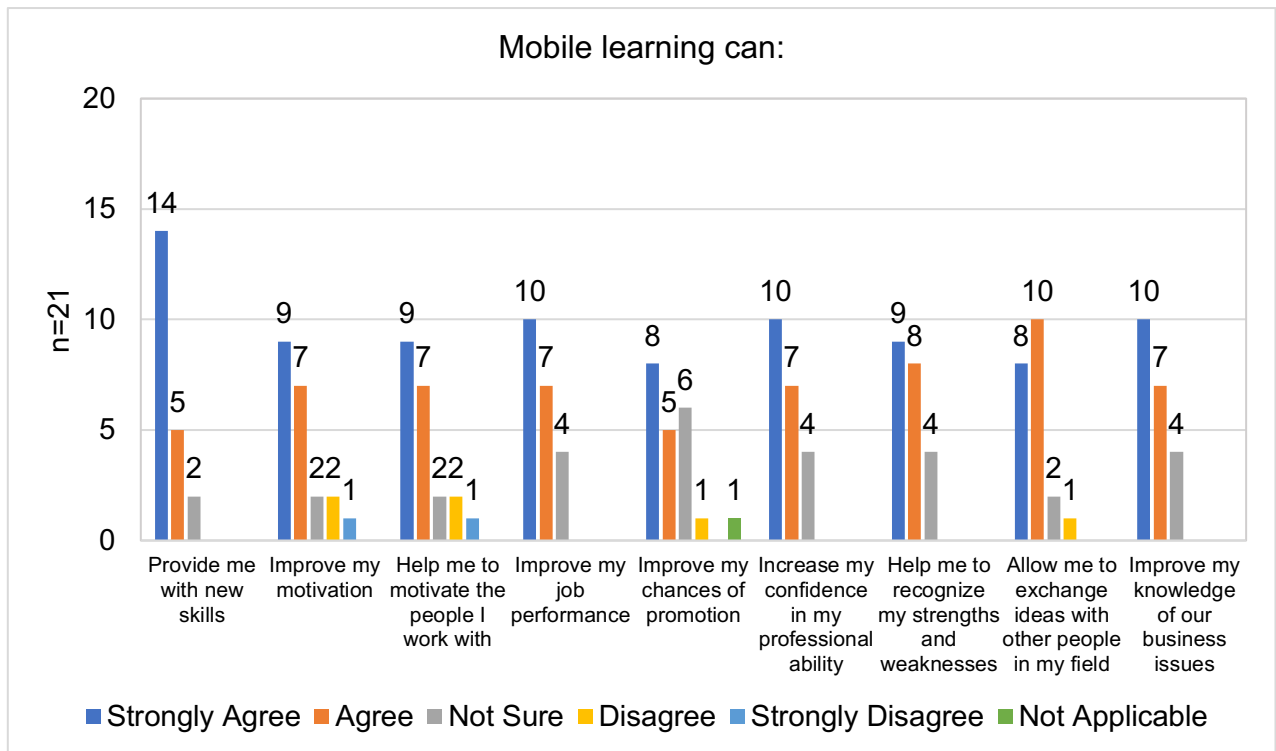


Figure 5.27 What mobile learning can do

Mobile Learning	% Responses from Staff
1. Inculcates new skills	90
2. Improves motivation	76
3. Helps motivate others	76
4. Improves job performance	81
5. Improves chances of promotion	62
6. Increases professional confidence	81
7. Helps identify strengths and weaknesses	81
8. Facilitates exchange of ideas	86
9. Improves business knowledge	81

Table 5.3 Effectiveness of mobile learning

One of the training managers felt mobile learning is mainly being used for motivation. He agreed with the interviewer that mobile learning is most effective to pique staff's interest so that they would explore the product through e-learning.

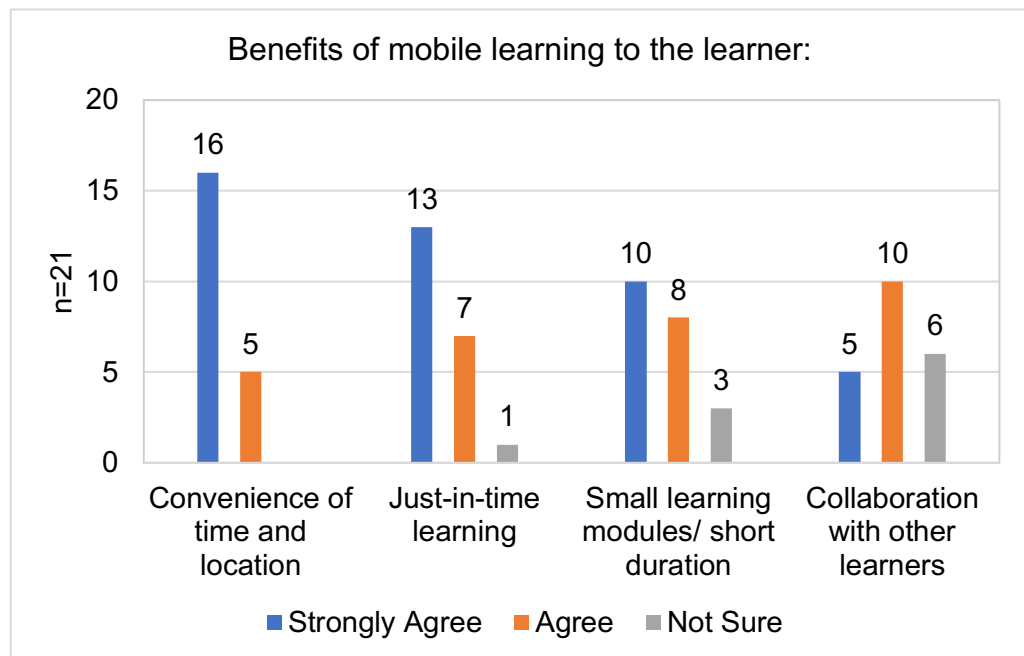


Figure 5.28 Benefits of mobile learning to the learner

It was felt the main benefits of mobile learning are its success in overcoming the barriers of time and location, short duration, and allowing learners to access learning when needed. All staff thought mobile learning provided the convenience of “time and location” to learners, 95% of them equated convenience with “just-in-time learning”, 86% with “small learning modules/short duration”, and 71% thought it is “collaborative” (Figure 5.28).

5.4.5 Mobile Learning Within the Framework of Sharples

5.4.5.1 Subjects

Mobile learning is suitable for “all kinds of learners” – Staff and Training Managers

The subjects for mobile learning were primarily sales and service professionals. PCI sells its products and services through multiple channels (reseller, direct, and retail). A certain population of sales personnel in PCI who are technically qualified, specialise in selling to resellers (large companies marketing to specific geographical and/or customer verticals), visiting them regularly. Sales personnel with engineering and computer sciences background sell high-end computers and servers directly to corporate customers, travelling extensively to visit them. Sales personnel selling at retail chains are millennials and high school graduates who work in a fixed physical location, attending to walk in customers. This is one segment of subjects who use mobile learning to learn to demonstrate their products to prospective

customers. The other segment, service personnel, also use mobile learning substantially. They conduct preventive or breakdown maintenance and find mobile learning very helpful to refresh their memories.

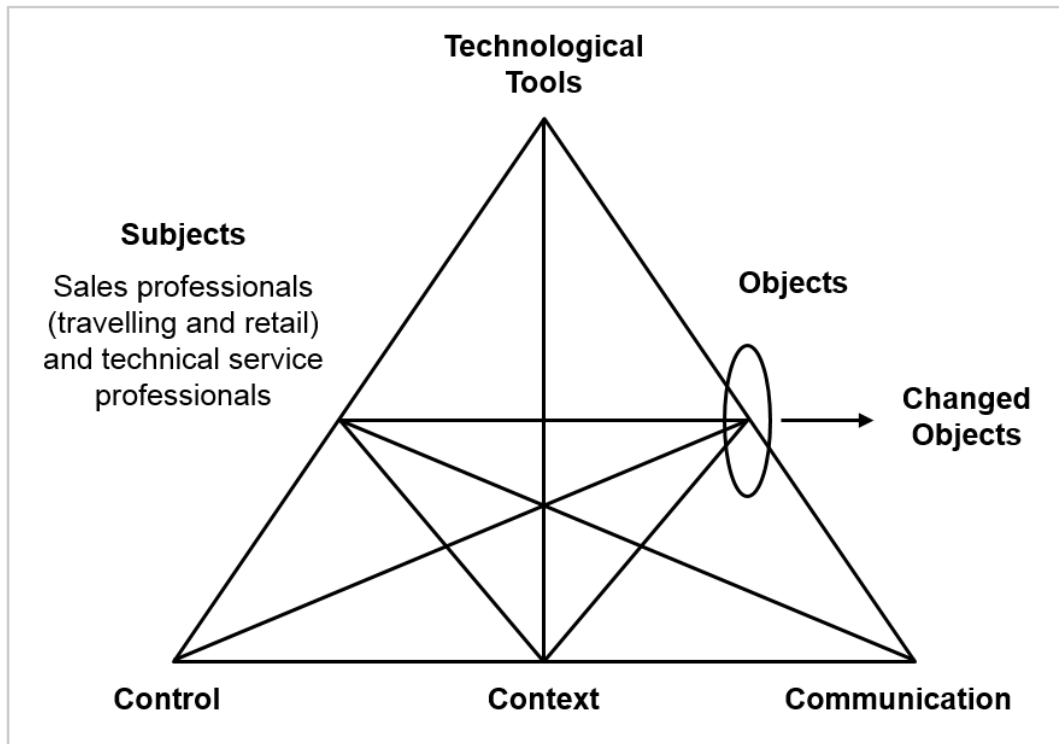


Figure 5.29 Mobile Learning within Sharples' Framework at PCI – Subjects

Both training managers and 81% of staff did not agree that mobile learning is suitable only for a particular type of learner, believing it suitable for “all kinds” of learners (Figure 5.30).

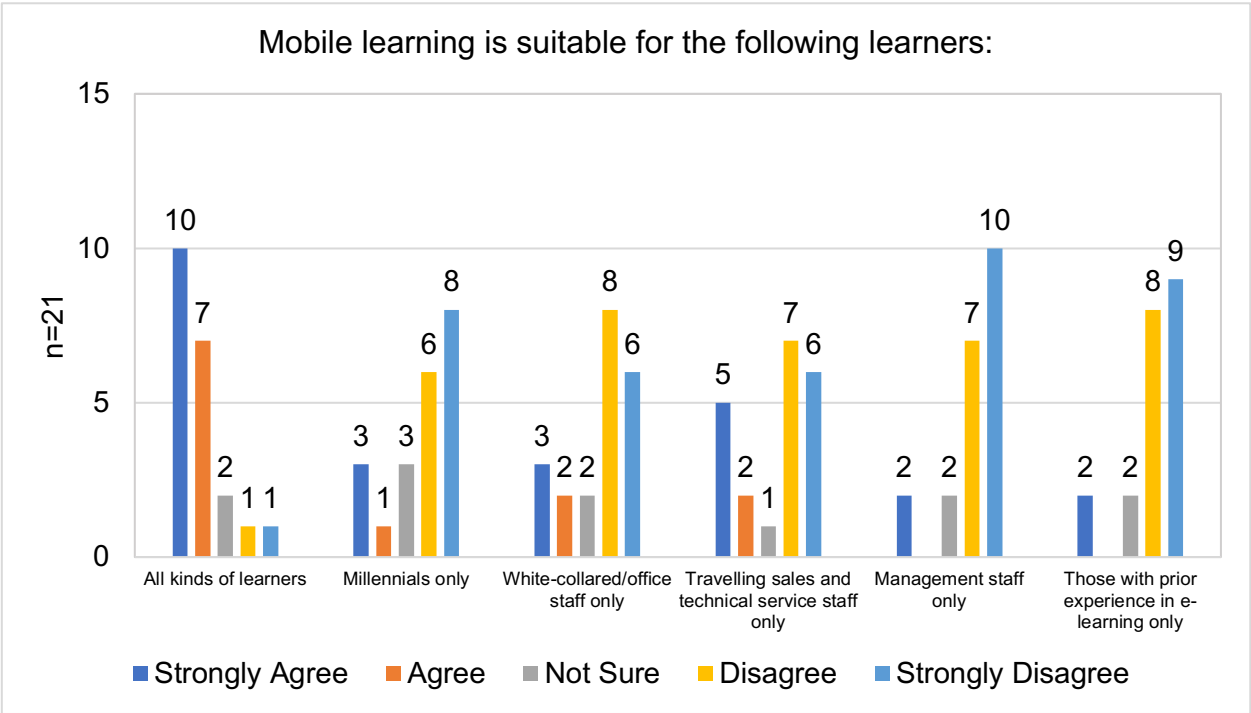


Figure 5.30 Mobile learning is suitable for specific type of learners

5.4.5.2 Objects

Mobile learning is suitable for “all kinds of topics” – Staff

PCI uses mobile learning mainly for product and technical service training for its sales and service personnel. The ‘Objects’ take the form of on-the-job performance support (including product videos) and digital resources for product training, compliance training, process training, sales and marketing training, and technical training.

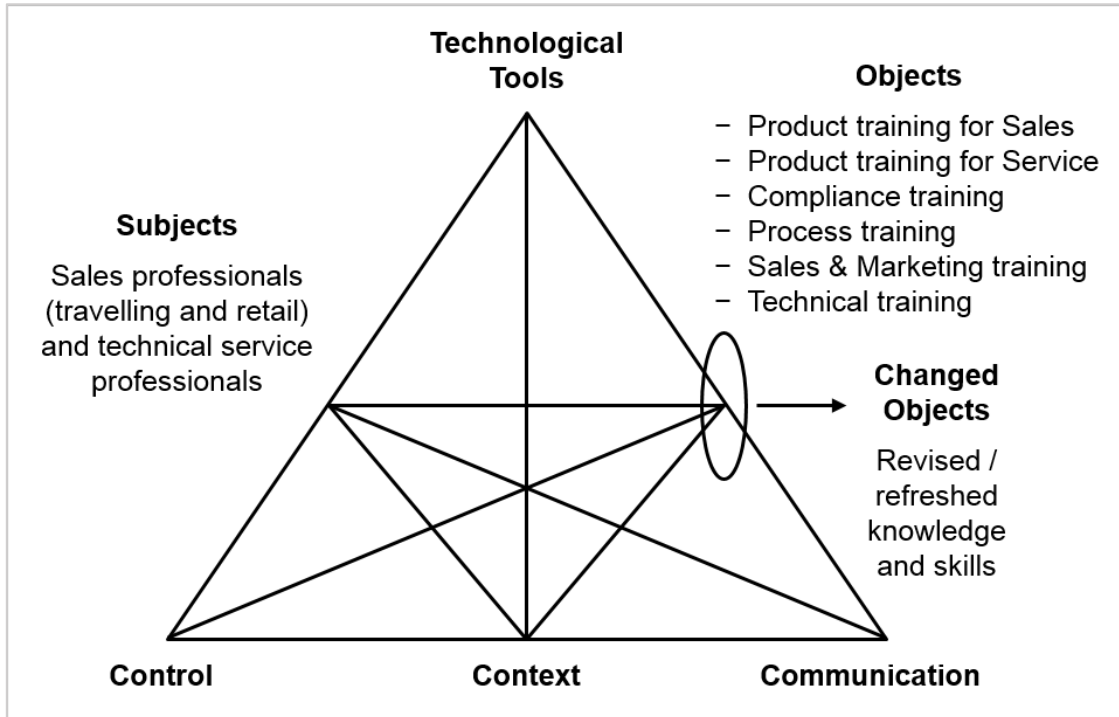


Figure 5.31 Mobile Learning within Sharple's Framework at PCI - Objects

Although 80% of staff believed e-learning and mobile learning can teach any topic (Figure 5.32 and Figure 5.33), the majority felt mobile learning is especially effective for product, compliance, process, sales and marketing, and technical training (Figure 5.33).

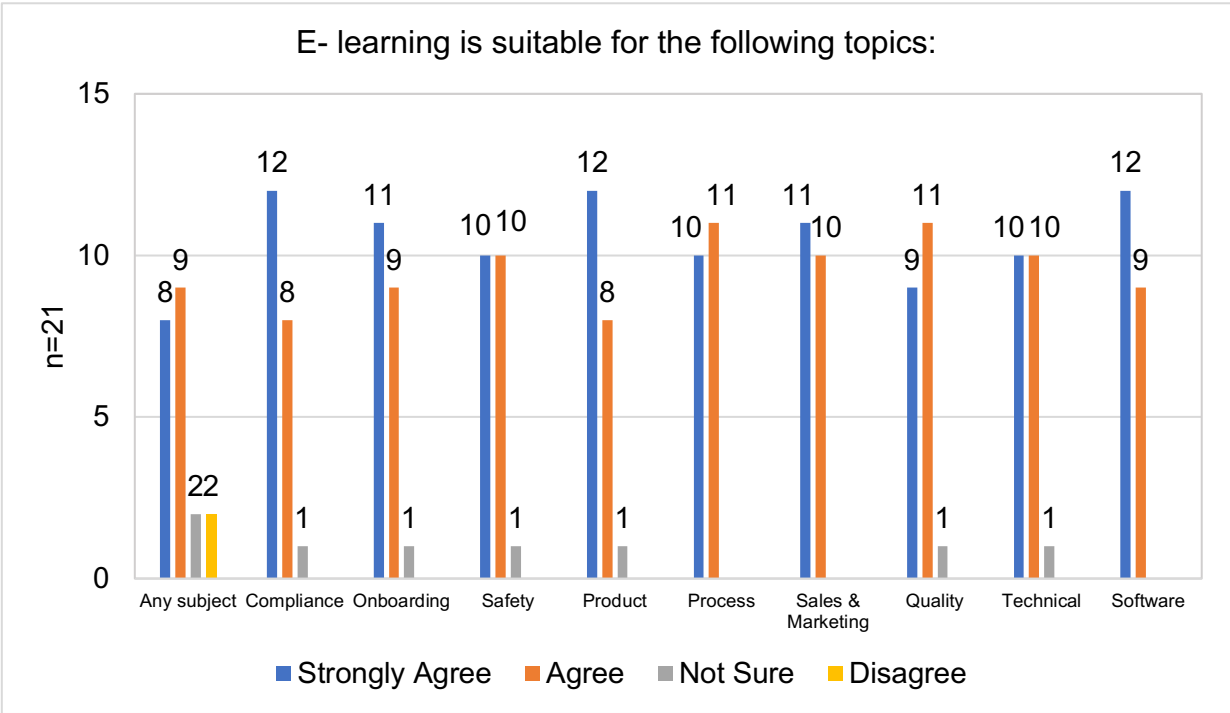


Figure 5.32 E-learning is suitable for stated topics

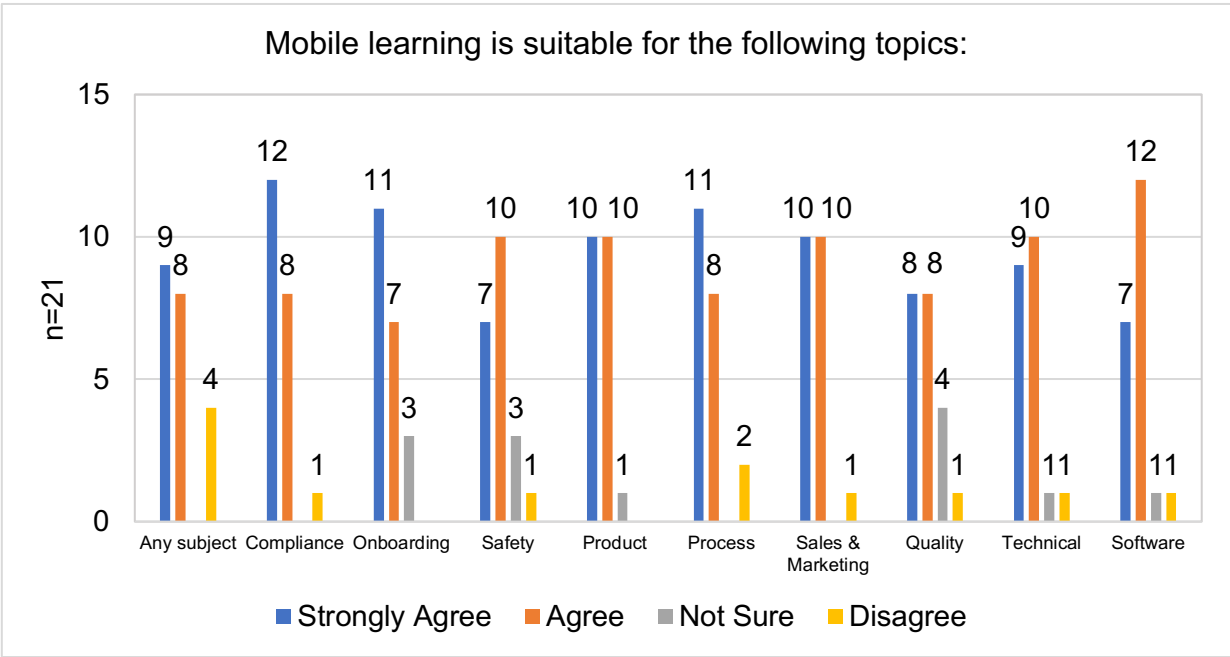


Figure 5.33 Mobile learning is suitable for the given topics

The training managers, however, believed that e-learning is best suited for topics requiring longer time to learn, and mobile learning to learn topics quickly, as a refresher or at the point of need to immediately apply to work.

95% of staff agreed that mobile learning is suitable for product training.

One of the training managers considered mobile learning ideal for product demos, and also felt the nature of content determined the effectiveness of mobile learning; it is ideal for sales but “less valuable” for topics that had to be studied in detail.

95% of staff also felt mobile learning is suitable for compliance training (Figure 5.33), though one of the training managers felt the format used for compliance training does not make any difference, as it is mandatory in any case.

All the staff felt mobile learning is suitable for process training (Figure 5.33).

Though 95% of staff believed mobile learning is most suitable for sales and marketing training (Figure 5.33), one of the training managers felt mobile learning it is not suited for soft skills and behaviour training.

The other training manager however, felt mobile learning “*is motivational*”, and is most effective to pique the interest of the staff. He believed the best way mobile learning can be used is to link it with e-learning and other digital resources.

90% of staff thought mobile learning is suitable for technical training (Figure 5.33). One of the training managers felt mobile learning is most effective for technical training for technicians. He agreed with the interviewer that “*mobile learning is impacting a lot on performance support and job aids rather than traditional learning.*”

5.4.5.3 Technological Tools

“The bigger the device, the better. It is the tablet.” – Training Manager 2

The company hosts all its learning content including mobile learning content on its servers and a third party LMS. It also uses an LCMS to curate and deliver content related to its products and services.

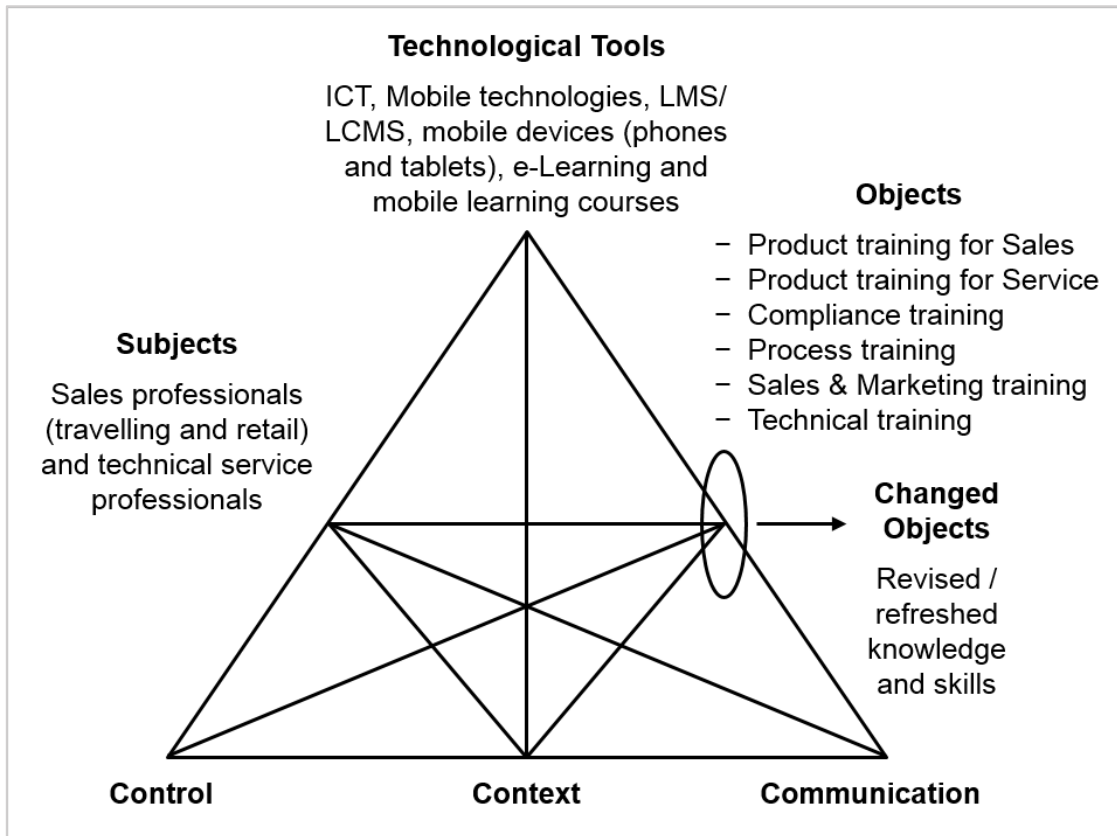


Figure 5.34 Mobile Learning within Sharpley's Framework at PCI – Technological tools

The staff use mobile phones and tablets to access mobile learning objects (BYOD plus company provided devices).

Training Manager 2 felt phones are essential in emerging markets, whereas in mature markets, people are being trained to gain information from a laptop, not a mobile. Although the most effective training is delivered on the desktop, *“we need to enable the person selling a device to do that on the tablet as he faces the customer”*.

Most of the staff and both the training managers felt the tablet is the most appropriate mobile device (hardware) for mobile learning though smart phones are also an effective medium (Figure 5.35).

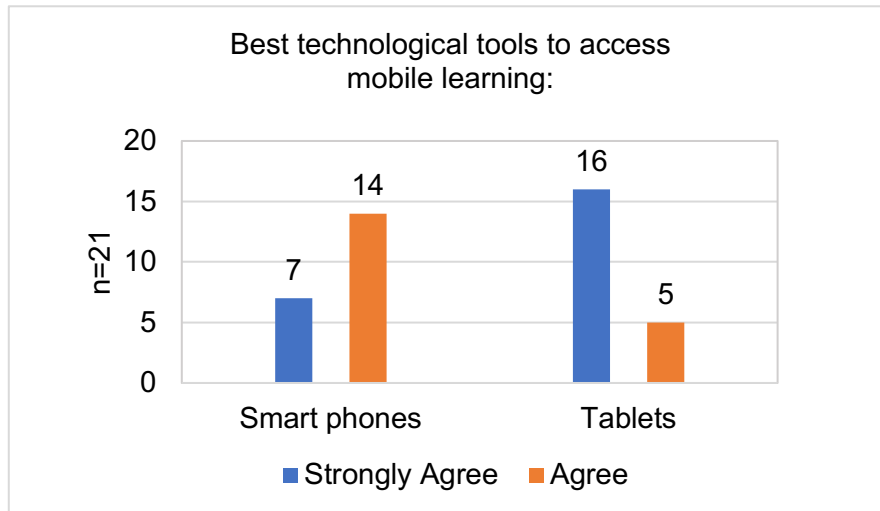


Figure 5.35 Best technological tool to access mobile learning

5.4.5.4 Context: Community and Locations

“What mattered in mobile learning irrespective of the location, is the content type and the need of the person”. – Training Managers

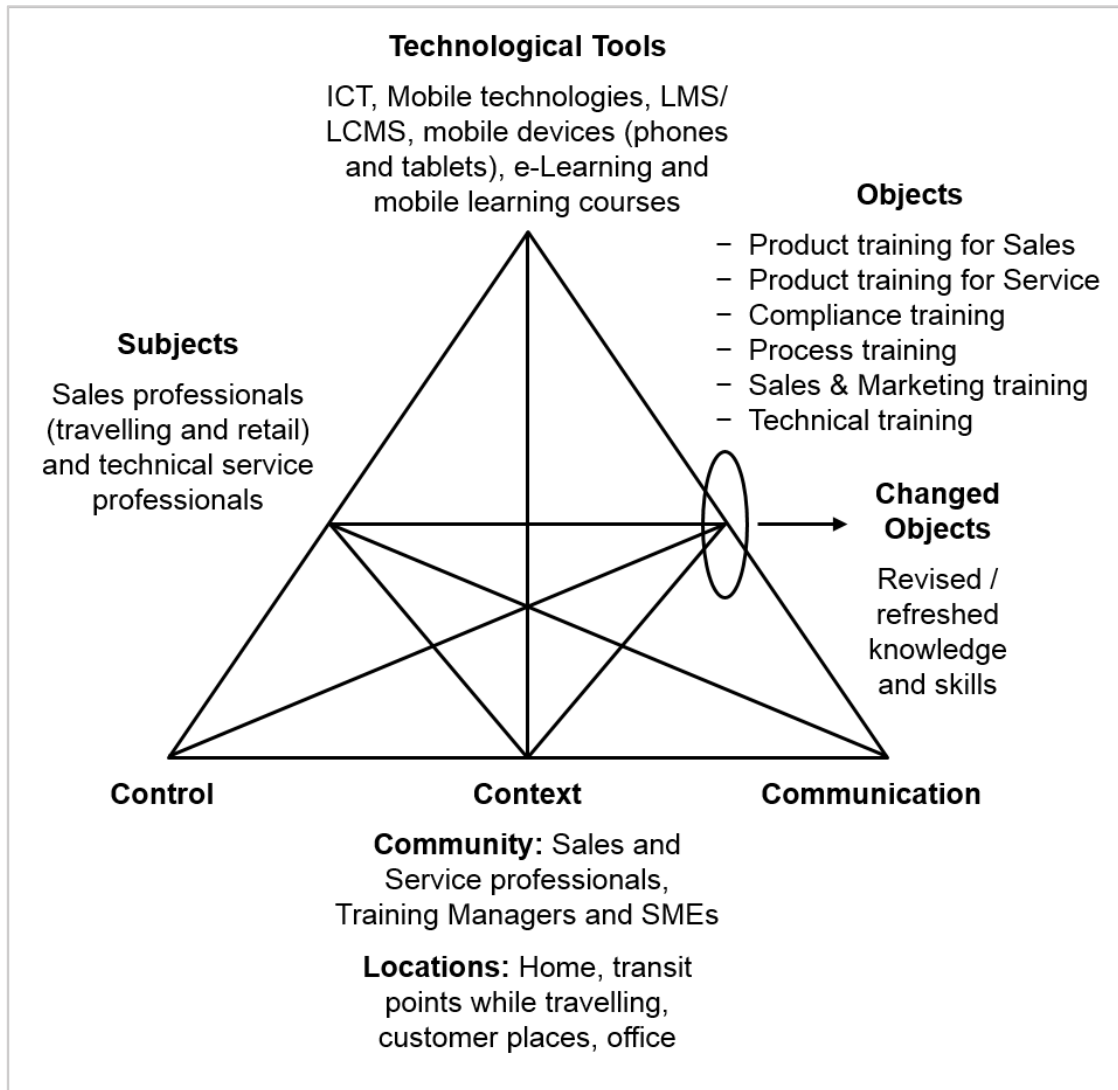


Figure 5.36 Mobile Learning within Sharpley's Framework at PCI – Context

Community

The main community of mobile learning are the sales and service personnel.

- a) Sales professionals selling high-technology, high-value computer systems and servers to corporate organisations
- b) Sales professionals selling specific market-segment aligned products and services to large reseller companies

-
-
- c) Sales professionals selling consumer electronic products in retail stores/
chains
 - d) Technical service professionals conducting preventive or breakdown
maintenance at customer sites

Training managers and SMEs also form part of the mobile learning community in this organisation.

Locations

Of the four groups, only the sales professionals selling laptops and tablets in retail stores are not physically mobile.

For the three groups traveling to customer locations, mobile learning happens in various locations – hotels, places of transit, customer offices and factories, and places of recreation such as restaurants and parks.

All the staff felt mobile learning is ideal for office, home, transit points, and places of recreation, 90% agreeing that it is suitable when travelling in an automobile/airplane (Figure 5.37).

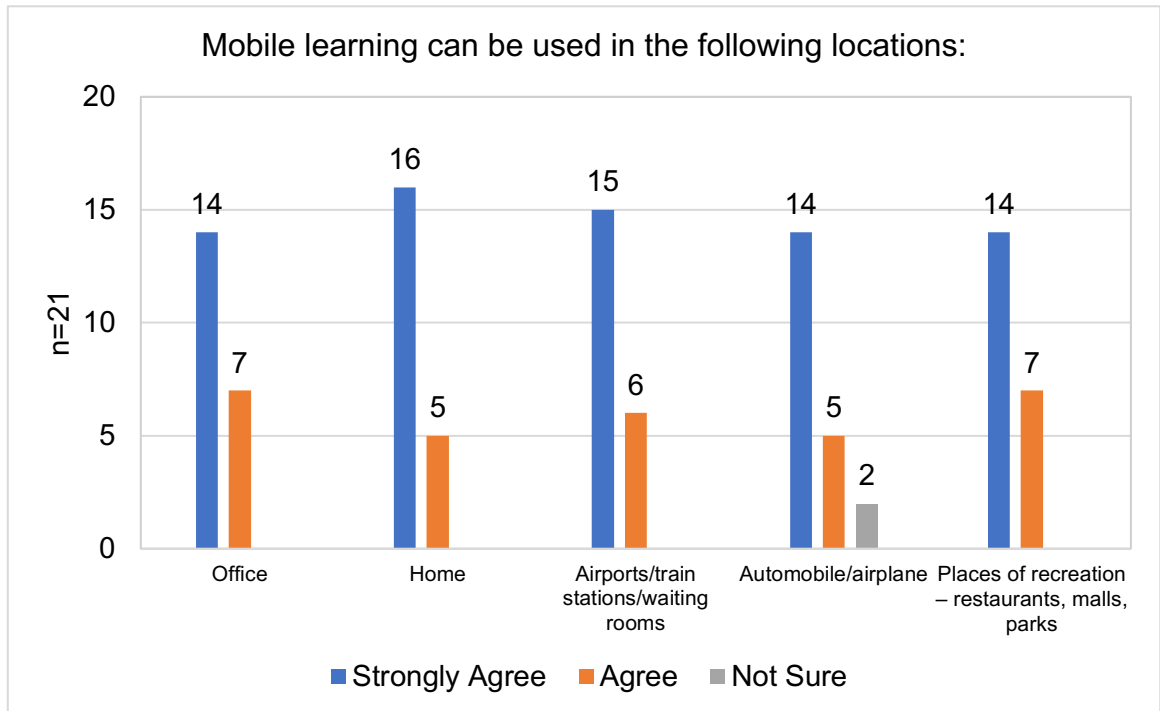


Figure 5.37 Best locations for mobile learning

The training managers believed that irrespective of the location, the content type and the need of the person mattered more. One of them felt learners should be able access to information at their point of need. He cited the example of a sales representative travelling to meet a customer and needing, for instance, the top three advantages PCI has over a competitor’s product. In that situation, the preferred method would be mobile delivery through the dashboard. However, he wasn’t quite sure if this could be called mobile learning.

The other training manager had a similar view, saying everyone “*uses smartphones today and learns by pulling information from apps at that point*”.

The first training manager had an interesting angle to the question of location, pointing out that in his experience, it is not about mobile learning being adopted based on location but on the non-availability of other devices.

5.4.5.5 Control: Technological Restrictions and Social Rules

First among the barriers for mobile learning is usability limitations of mobile devices (screen size, incompatibility with Adobe Flash) followed by Internet bandwidth issues. (Note: The situation has hugely improved since this interview). Restrictive IT security protocols and lack of responsive design technology led to mobile courses not playing well on multiple devices as staff accessed training through their personal mobile devices.

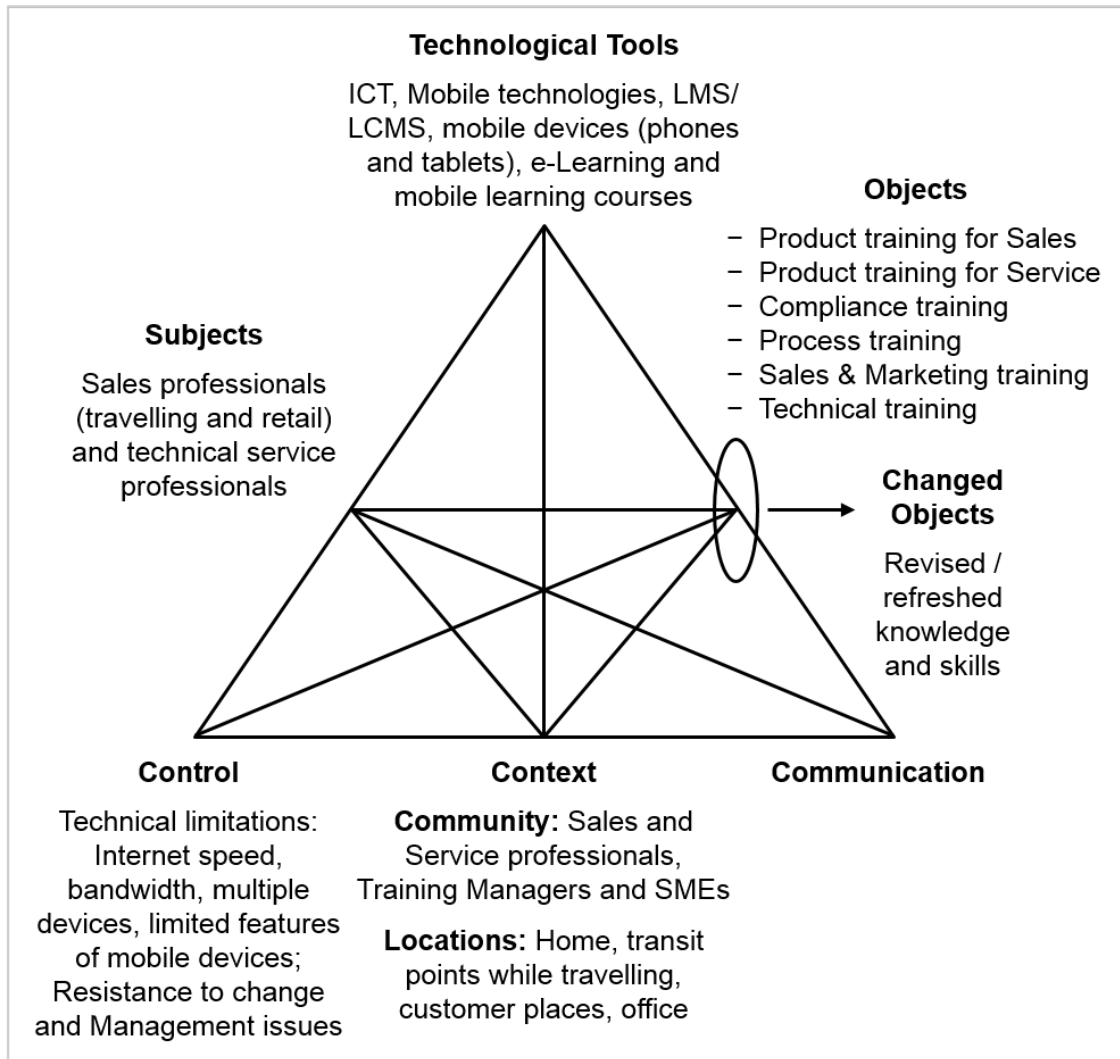


Figure 5.38 Mobile Learning within Sharpley's Framework at PCI – Control

The main restrictions to deployment of mobile learning according to the staff are as listed below (Table 5.4):

Barriers to Mobile Learning	% Responses from Staff
IT security issues	81
Financial/budget constraints	76
Psychological resistance of stakeholders	71
Technology issues (e.g. multiple devices)	81
LMS issues (tracking)	71
Usability limitations of mobile devices (screen size, Flash incompatibility)	95
Internet bandwidth issues	90

Table 5.4 Barriers to mobile learning as per staff

But none of the conventional barriers figured in the training managers' responses. One of them felt the biggest barrier is lack of money because the benefits of mobile learning are still not very apparent to the management. This is followed by barriers to do with people, skills, and the efforts to shift the paradigm.

The other felt the biggest barrier is delivering learning to a broader audience, which is being impacted by market drivers and PCI's priorities in various market segments.

Technological Restrictions

One of the biggest barriers to mobile learning is "*Internet bandwidth issues*"

– Staff and Training Managers

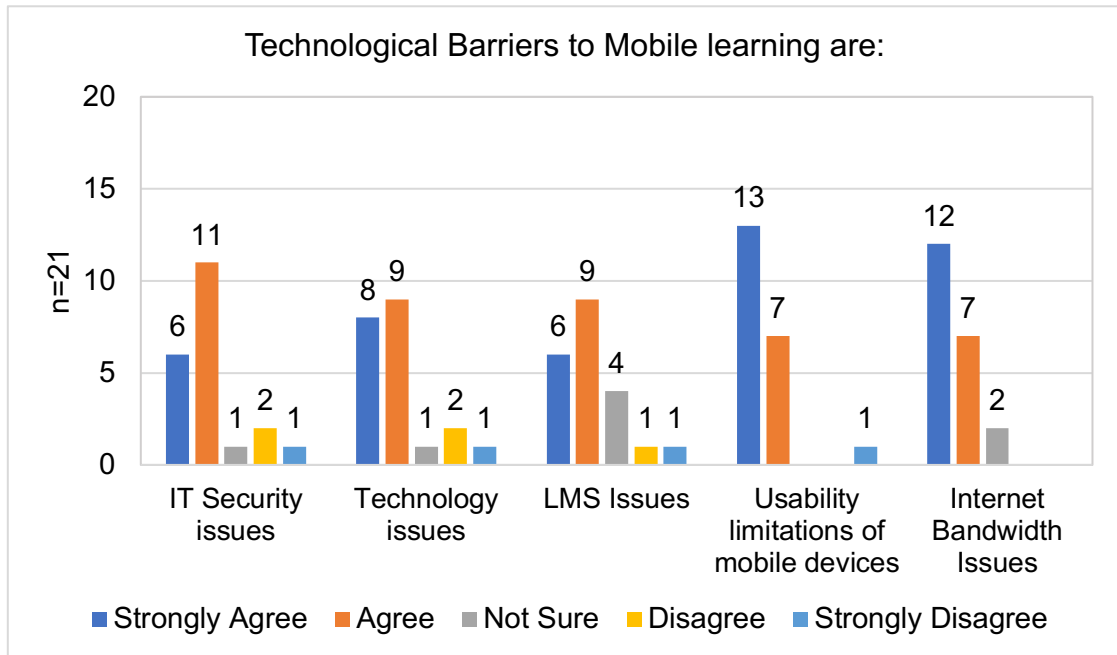


Figure 5.39 Technological Barriers to mobile learning

Usability Limitations of Mobile Devices

95% of staff felt screen size and inability to play Flash were hindrances to mobile learning (Figure 5.39).

Internet Bandwidth Issues

90% of staff considered Internet bandwidth issues one of the biggest barriers to mobile learning (Figure 5.39). One of the training managers who experienced mobile learning through mobile apps said it worked well for the pilot, and that mobile apps are likely to be one of the routes for implementing mobile learning going forward.

IT Security Issues

81% of staff believed IT security is a problem (Figure 5.39). One of the training managers felt technology challenges could vary depending on where the staff were accessing learning from.

Technology Issues (Multiple Devices of Learners)

81% of staff and both training managers agreed that staff using different devices is a barrier to mobile learning (Figure 5.39).

LMS Issues

While 71% of staff thought LMS issues pose a significant problem in mobile learning, 19% were not sure and 9% disagreed (Figure 5.39). The training managers had nothing specific to say about LMS/LCMS issues.

Social Rules

“Apart from training leadership, not many people understand what mobile learning means. So, we need to make business leaders understand what it is, why it is the right thing to do, and how to do it”. – Training Manager 1

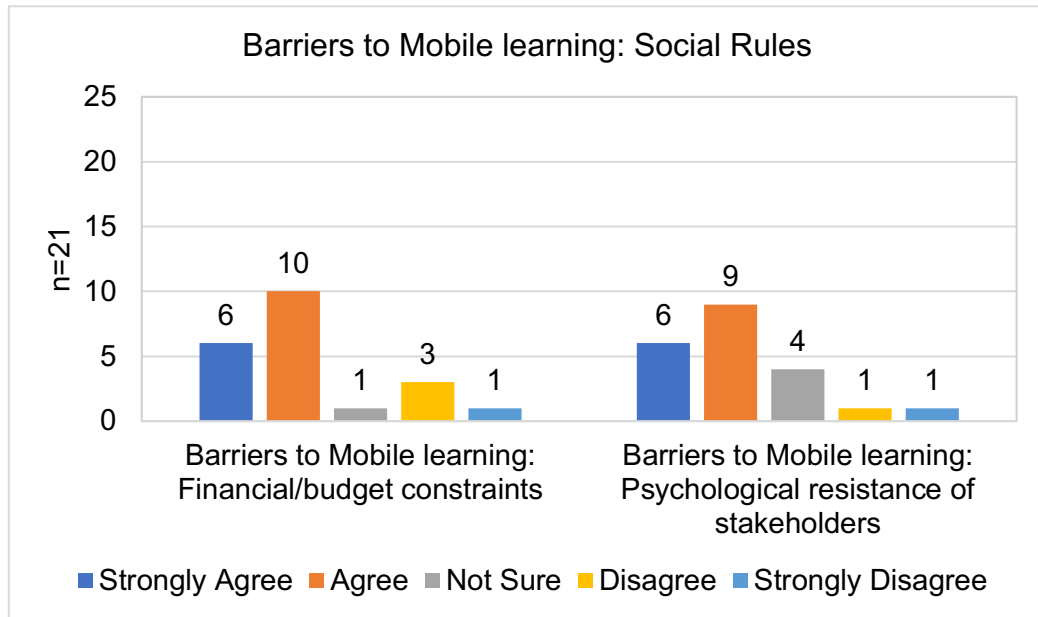


Figure 5.40 Barriers to mobile learning – social rules

Leadership Support

The training managers believed the leadership should be educated on mobile learning, hinting it lacks leadership support.

76% of staff thought senior management’s restrictions on budgets for mobile learning (Figure 5.40) is an important barrier. Money was thought to be one of the main barriers to implementing mobile learning as it has to be made clear “*whether the company is paying for the devices*”. Lack of adequate budget could possibly be attributed to lack of leadership support.

Resistance to Change

71% of staff believed psychological resistance of stakeholders is a barrier to mobile learning, while 29% disagreed or were not sure (Figure 5.40).

According to one of the training managers, face-to-face training and experiential labs are best for behavioural training, as even e-learning fell short.

5.4.5.6 Communication: Channels and Conversations

“We created individual learning based on our organisation’s roles and guidelines for how those roles use the application. We created 5 different personas. When I pick the role, it would pick the next steps about the major tasks that I have to perform using the application.” – Training Manager 1

Mobile learning is considered suitable only for individual, asynchronous learning.

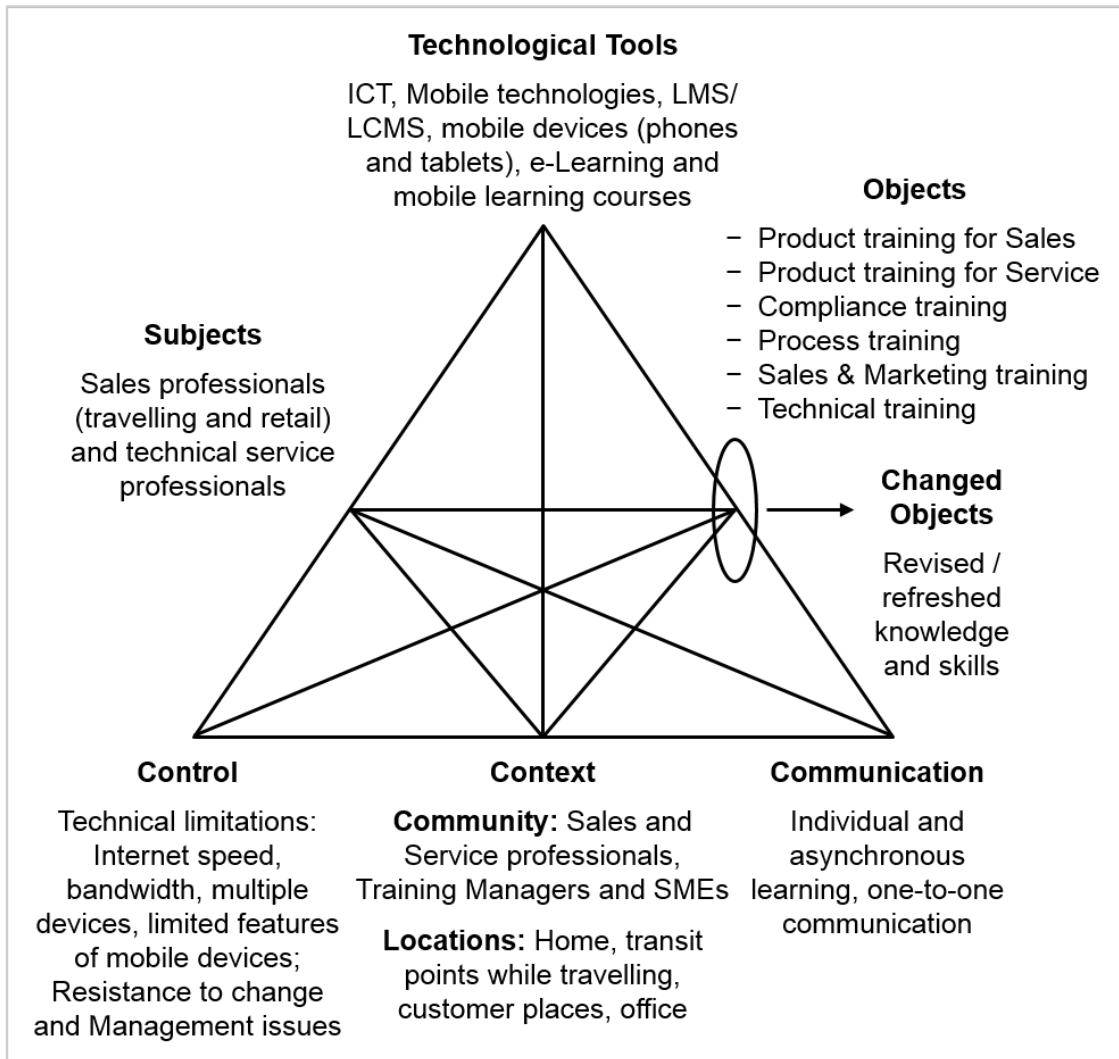


Figure 5.41 Mobile Learning within Sharple's Framework at PCI – Communication

All the staff thought mobile learning is suited for individual learning, 86% believing it is suitable for asynchronous learning. 62% thought it is useful for collaborative learning and 67%, for synchronous learning (Figure 5.42).

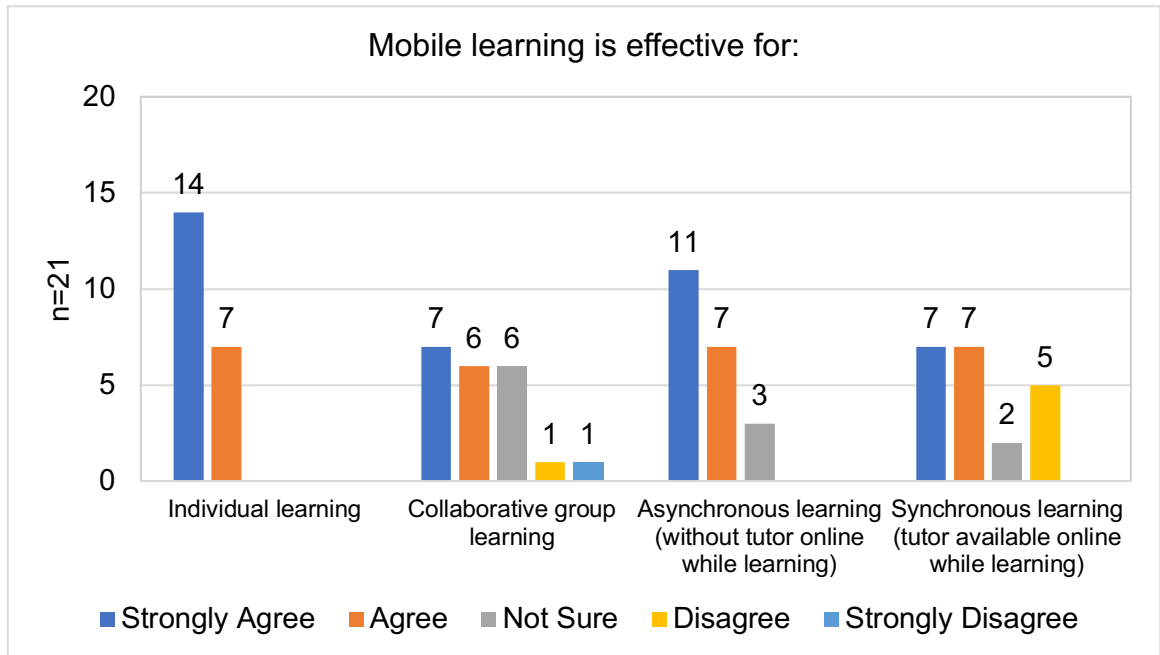


Figure 5.42 When is mobile learning effective?

One of the training managers explained how they used role-based individual learning through their mobile learning application.

5.4.6 Mapping Mobile Learning Activity

The following is the mobile learning activity mapped on Mike Sharples' Framework.

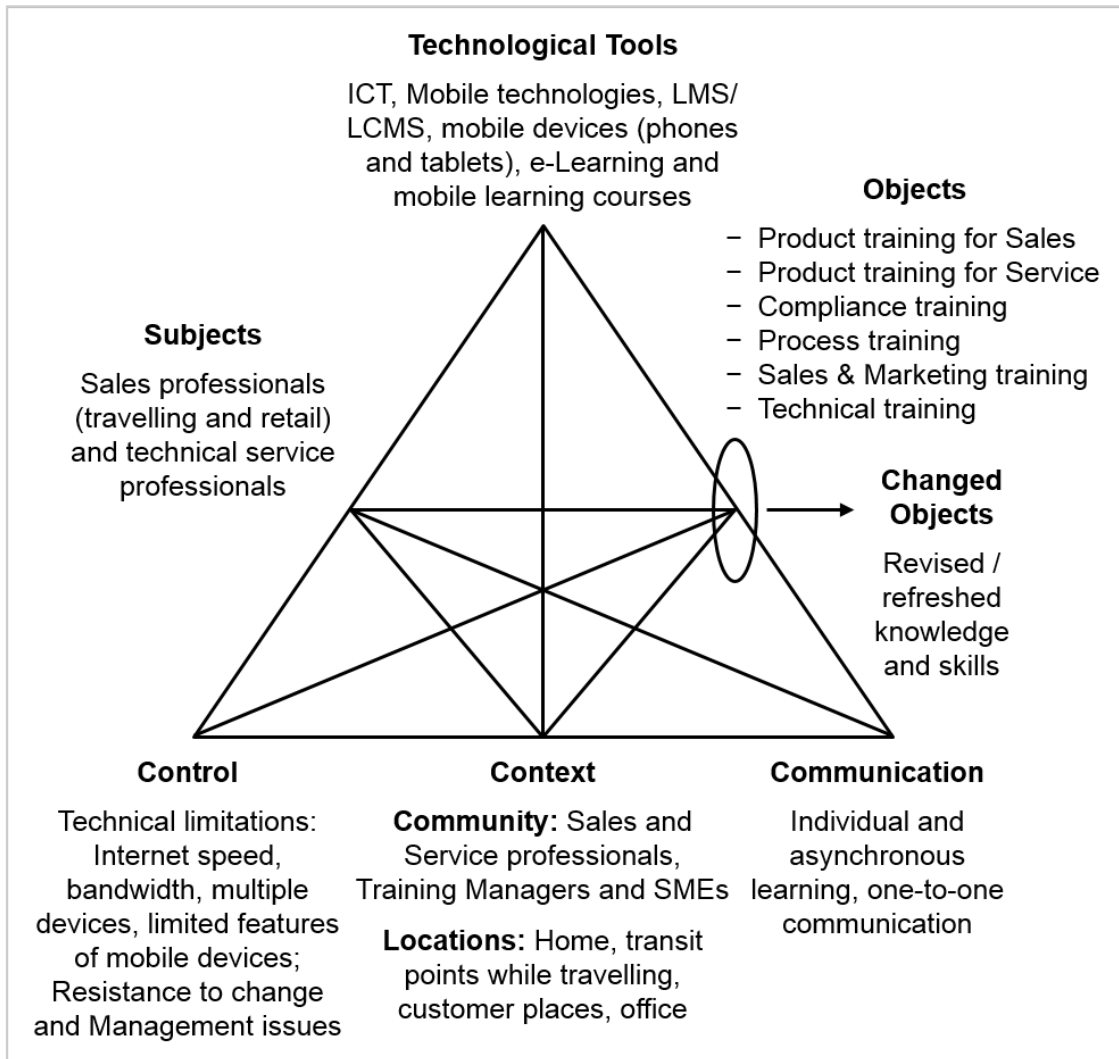


Figure 5.43 Mobile learning activity at PCI mapped on Mike Sharples' Framework

Subjects: The primary subjects are the sales and service professionals of different customer segments (corporate and retail customers and resellers), both fresh recruits and experienced ones.

Object: The objects are product training (for both sales and service personnel), compliance training, process training, sales and marketing training, and technical training. Changed objects are the revised knowledge and skills based on feedback from experienced sales and service

professionals. However, in the absence of interactions with and contributions from learners, the objects did not evolve, and hence were not revised.

Technological Tools: Technological tools include Internet and communication technologies, mobile technologies, LMS, mobile devices, e-learning and mobile learning courses.

Control: The organisation listed Internet speed, bandwidth limitations, difficulty in managing content on multiple devices, limited features of mobile devices, resistance to change, and management issues as barriers.

Context: Context includes locations and communities.

- **Locations:** Learning could take place in the homes of learners, hotels or transit points while travelling to customers, or customer sites.
- **Community:** The learning community primarily comprises sales and service professionals, training managers, and SMEs.

Communication: Communication is primarily one-on-one between individual learners, and learning is asynchronous self-learning.

5.4.7 Tensions in Mobile Learning Activity

A few tensions were identified during the study between the elements of the Sharples' Framework. Important ones are described below.

5.4.7.1 Subjects vs Technological Tools

This tension was mainly expressed when training managers discussed particular subjects. Training managers felt that learners in some Asia-Pacific regions (usually described as "APAC markets" within the corporation) faced difficulties in accessing learning when needed due to low Internet speeds and bandwidth issues. However, they felt mobile learning was suitable for regions such as India and Russia as it overcomes the barriers of limited access to computers or Internet while on the move. There were therefore some misgivings about how different subjects might be able to access the same learning content.

5.4.7.2 Subjects vs Objects

The training managers felt that subjects benefitted when mobile learning objects were restricted to small, relatively easy to assimilate "nuggets", used as a tool to pique staff's interest for in-depth e-learning courses and for just-in-time learning. They felt that lengthier topics should be reserved for e-learning and classroom training. Learners did not share this view. This tension is similar to that for ABT (see *section 5.3.7.2*).

5.4.7.3 Subjects vs Controls

Most learners felt the constraints for adoption of mobile learning were of two types – first, the technical limitations like Internet speed, bandwidth, multiple devices, limited device features; second, the lack of quantifiable benefits as perceived by management, with these management issues affecting the budget for implementation and restricting its usage to larger regions.

5.4.7.4 Subjects vs Communication

The main communication was between the learners and objects accessed through the technological tools. Both the training managers and staff thought mobile learning is for individual and asynchronous learning. They are yet to experience collaborative communication and learning between learners in real time or even asynchronously. There appears to be informal exchange of information and ideas via mobile devices in the company, but this was not part of the formal mobile learning initiatives. I would have liked to have investigated this issue further but my data on this topic was limited. I shall return to this issue in the *Conclusion chapter* where I discuss the limitations of this project and ideas for future research.

5.5 Case Report 3: Sun Finance Limited

5.5.1 Background

5.5.1.1 Brief Profile of the Company

According to its company website, Sun Finance Limited (a pseudonym) is a leading financial services provider based in Australia that offers a broad range of products and services in banking, wealth management, and insurance solutions.

The main audience for training in the company are the sales personnel. For this study, data was collected from two (2) training managers and thirty staff (30) members from the sales function.

5.5.1.2 About Mobile Learning in Sun Finance Group Ltd

According to the training managers, Sun Finance is one of the earliest companies in Australia to adopt e-learning for their staff, supplementing their classroom training. They have been using mobile learning since the last seven years. The company develops their own e-learning courses and also outsources them to third party e-learning companies. Though the company has no formal mobile learning programme, learning via mobile devices happens informally.

5.5.2 Relationship to Established E-learning Provision

“...when people think about e-learning, they think about static content. When they think of mobile learning, they think learning while walking around.” – Training Manager 2

The relationship with established e-learning provision is seen to be a close one by most respondents when it comes to mobile learning being a part of e-learning and NOT an entirely new way of learning. The points of difference between the two were stated as location of learning, range of technologies to access content, and technological tools used to access learning. The relationship with established e-learning provision is NOT seen to be a close one when it comes to mobile learning being the same as e-learning.

Though 66% of staff believed mobile learning to be part of the larger e-learning, 77% of them did not agree that mobile learning and e-learning are the same (Figure 5.44).

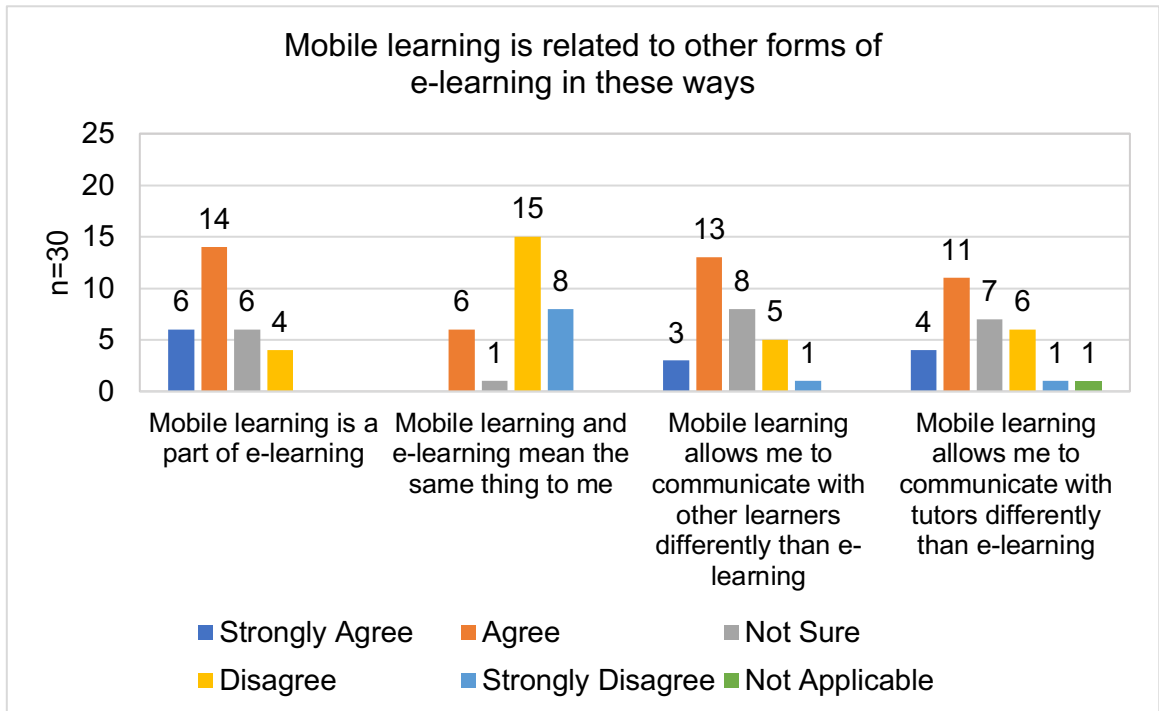


Figure 5.44 Relationship to Established E-learning Provision (a)

The training managers had somewhat contrasting views regarding e-learning and mobile learning. Training Manager 1 did not believe mobile learning is very different from e-learning, calling it a “*miniaturized version*” of e-learning, “*adapted to work on a mobile or handheld device*”. She said that even if something is specifically built for mobile learning, it would still be “*only online learning*” that would “*never replace more traditional classroom learning*”.

Training Manager 2 felt e-learning had a “*negative connotation*” unlike mobile learning which had a “*positive connotation*”. He considered them to be completely different due to the mobile’s “*on the move*” advantage. He felt e-learning is “*static learning used for compliance modules*”, “*not very exciting*”, and “*just something that has to be done*”. Mobile learning, he explained, has a clear edge over e-learning because it:

-
-
- a) Offers learners the flexibility to access learning anywhere
 - b) Makes learning interesting with more interactivity
 - c) Enables learners to learn even on the move

He further clarified that mobile learning modules may actually be e-learning modules that are mobile, and the *“fact that it is mobile makes it exciting”*, that there is a *“better motivational element”* with mobile learning with the user going through very engaging, interactive, and collaborative content.

When asked to compare mobile learning with e-learning, half the staff felt mobile learning allows learners to communicate with other learners and tutors in a different way (Figure 5.44).

80% of them thought they can use a greater range of technologies to access content with mobile learning, and 70% thought they can access content from more locations (Figure 5.45).

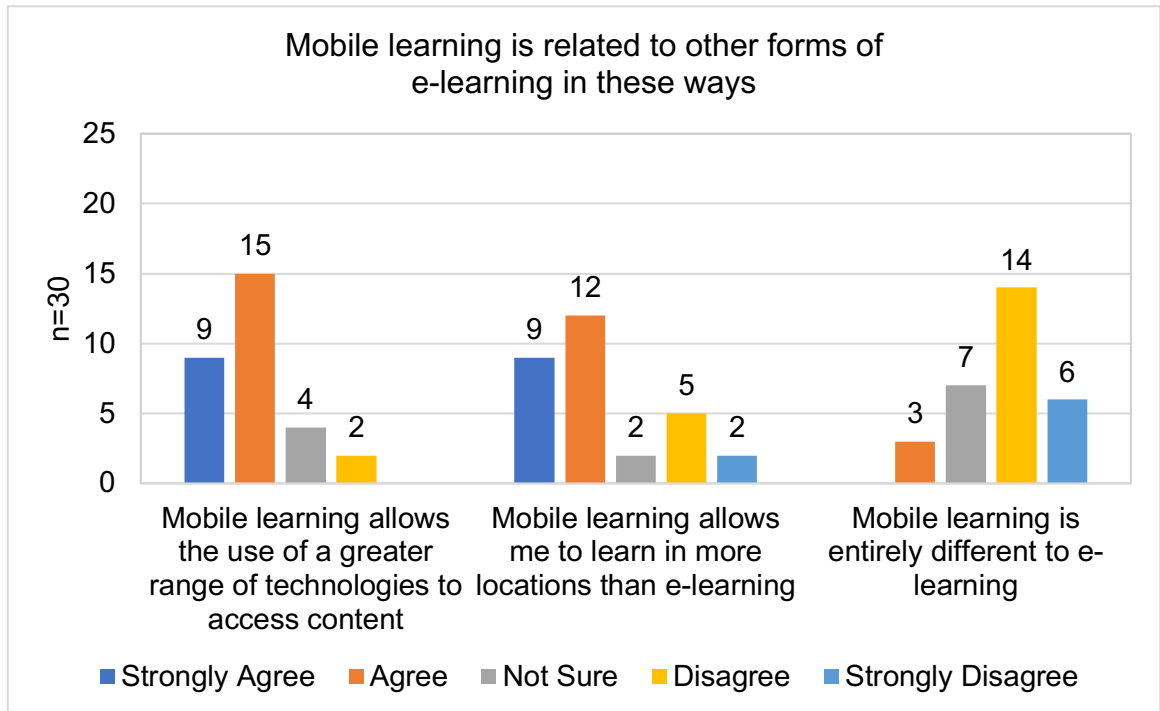


Figure 5.45 Relationship to Established E-learning Provision (b)

One of the training managers believed *“learning is learning regardless of the medium used. If it is suitable for online, it would be suitable for mobile”*. The other thought it is not only the device, but also the portability that motivates learners to engage in mobile learning, that there is a fundamental difference in how learners learn with mobile learning. He went on to assert that the *“small nuggets”* need not be short and could *“go for an hour or two”*.

67% of staff did not agree that mobile learning is entirely different from e-learning (Figure 5.45), and one of the training managers felt it is an extension of e-learning since it is *“still online learning”*.

5.5.3 Key Aspects of Mobile Learning

Mobile learning is “learning when you are not in a formal classroom, office, or in some other position that you are required to be in....there are 2 aspects to it – one is the mobility, and another is the device.” – Training Manager 2.

The key aspects of mobile learning, according to the participants, are that learning happens when the learner is mobile and using a mobile device, it is self-paced and not connected to a physical training environment. We will be unpacking these issues in the rest of this section.

According to 77% of staff, mobile learning is “*learning through a mobile device, while on the move*”, while 73% thought it is “*learning while on the move*” (Figure 5.46).

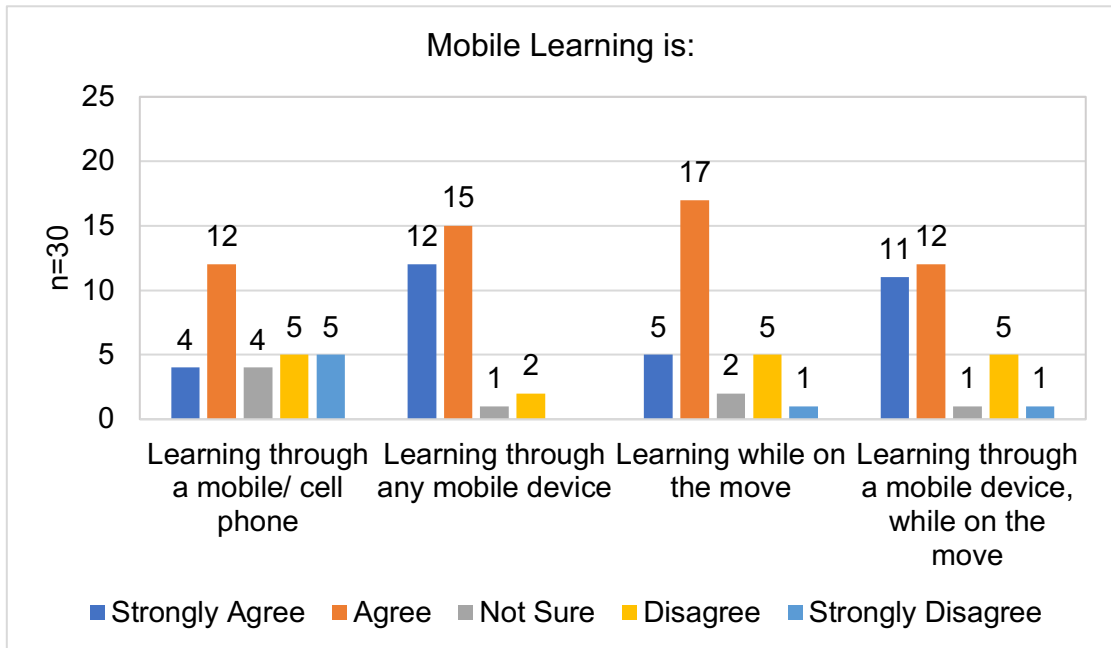


Figure 5.46 Key Aspects of Mobile Learning

53% of staff thought mobile learning is “*learning through a mobile phone*”, while 90% felt it is “*learning through any mobile device*” (Figure 5.46). Both training managers said the “mobility of the learner” is a pre-requisite to mobile learning.

5.5.4 Mobile Learning Within the Framework of Sharples

5.5.4.1 Subjects

Mobile learning is suitable for “*all kinds of learners*” – Training Managers and Staff

The 'subjects' for mobile learning are the staff engaged in e-learning and to a certain extent, mobile learning which, in the organisation's view, is a part of the larger e-learning. Subjects are sales professionals usually with an undergraduate degree in commerce, arts, or management, selling the company's financial products to individuals and organisations. Their job involves extensive travelling and a lot of waiting time – at customer places, bus/ train stations and sometimes airports.

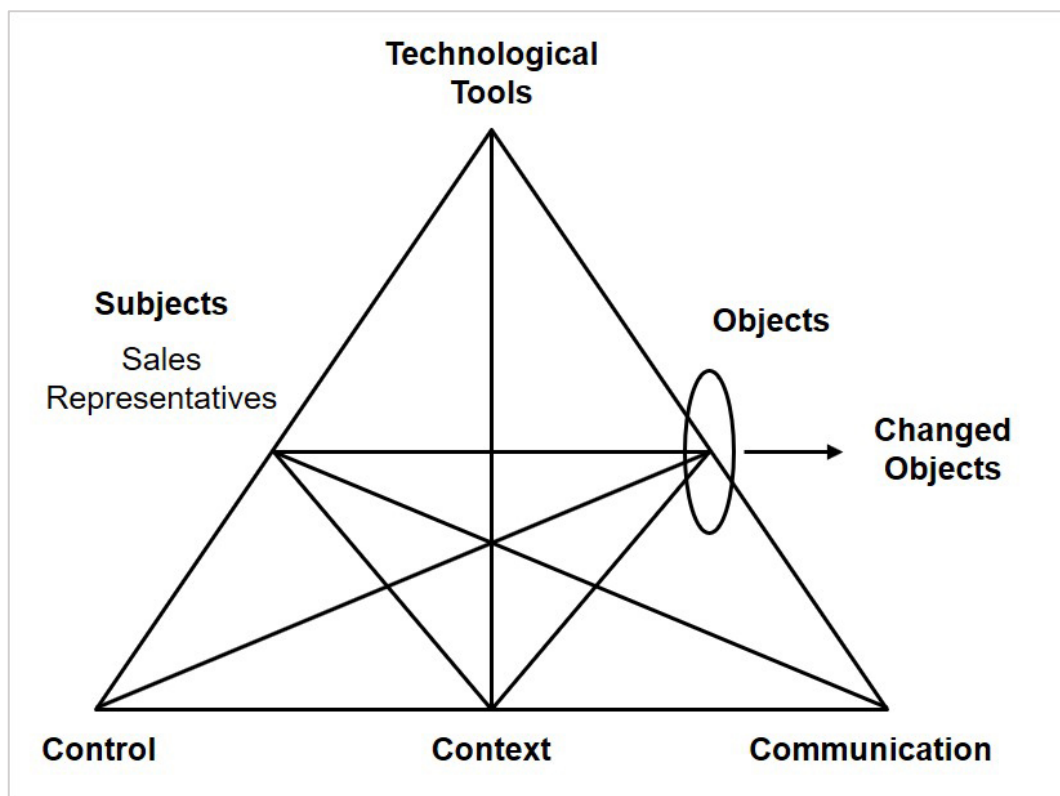


Figure 5.47 Mobile Learning within Sharpley's Framework at Sun Finance – Subjects

Both the training managers and most of the staff did not agree that mobile learning is suitable only for a particular type of learner; they felt mobile learning has a much broader applicability.

63% of staff agreed with their training managers that mobile learning is suitable for “all kinds of learners”, and most did NOT agree with the statement that mobile learning is suitable ONLY for millennials, or white-collared, travelling technical and management staff, or for those with prior experience in e-learning. The consensus was that mobile learning is suitable for all kinds of learners (Figure 5.48).

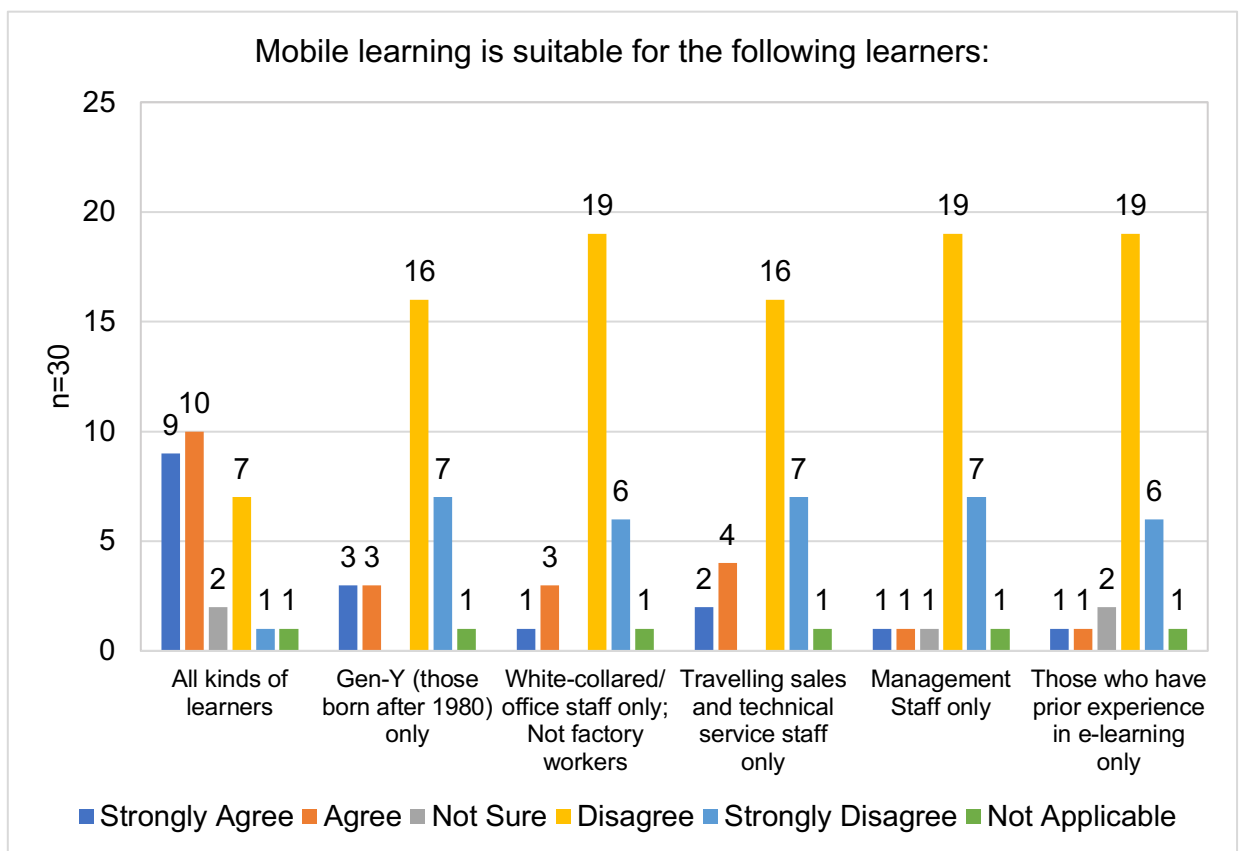


Figure 5.48 Mobile learning is suitable for specific type of learners

5.5.4.2 Objects

“It is the suitability of the content and learner that drives whether mobile learning is appropriate. Behavioural, soft skills generally are not done online, unless to build a base for classroom training.” – Training Manager 1

“... using devices such as tablets, you can’t do behavioural and mind change shift.” – Training Manager 2

Mobile learning generally builds on primary classroom training before salespersons go out into the field to sell. Important among the ‘Objects’ are product training, compliance training, safety training, process and technical training.

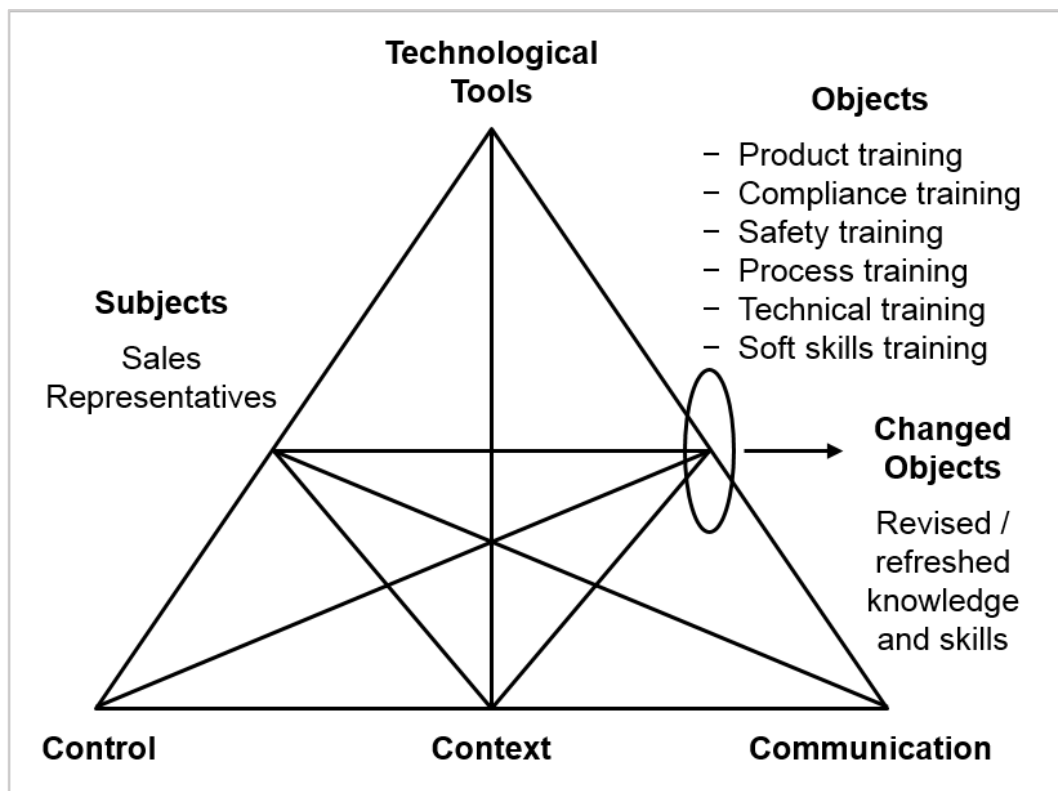


Figure 5.49 Mobile Learning within Sharpley's Framework at Sun Finance – Objects

Most of the staff readily agreed that mobile learning is suitable to teach any topic (object). While one training manager had reservations about the efficacy of both e-learning and mobile learning, the other considered it suitable for most topics.

57% of staff felt e-learning is suitable to teach any topic (Figure 5.50) and 53% felt the same about mobile learning (Figure 5.51).

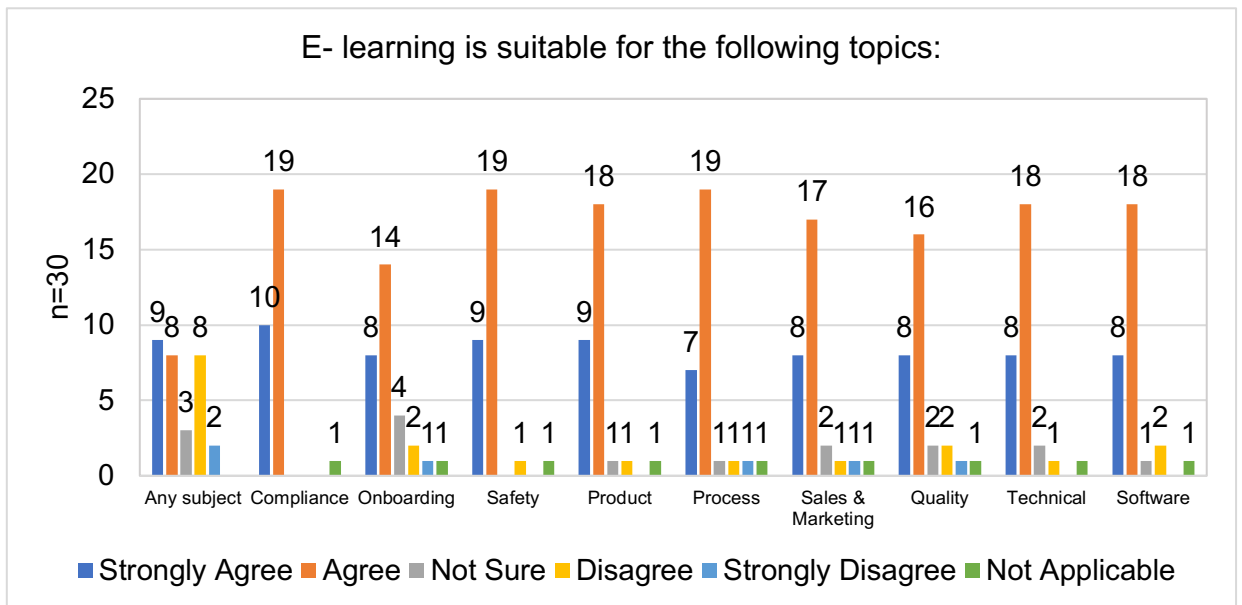


Figure 5.50 E-learning is suitable for stated topics

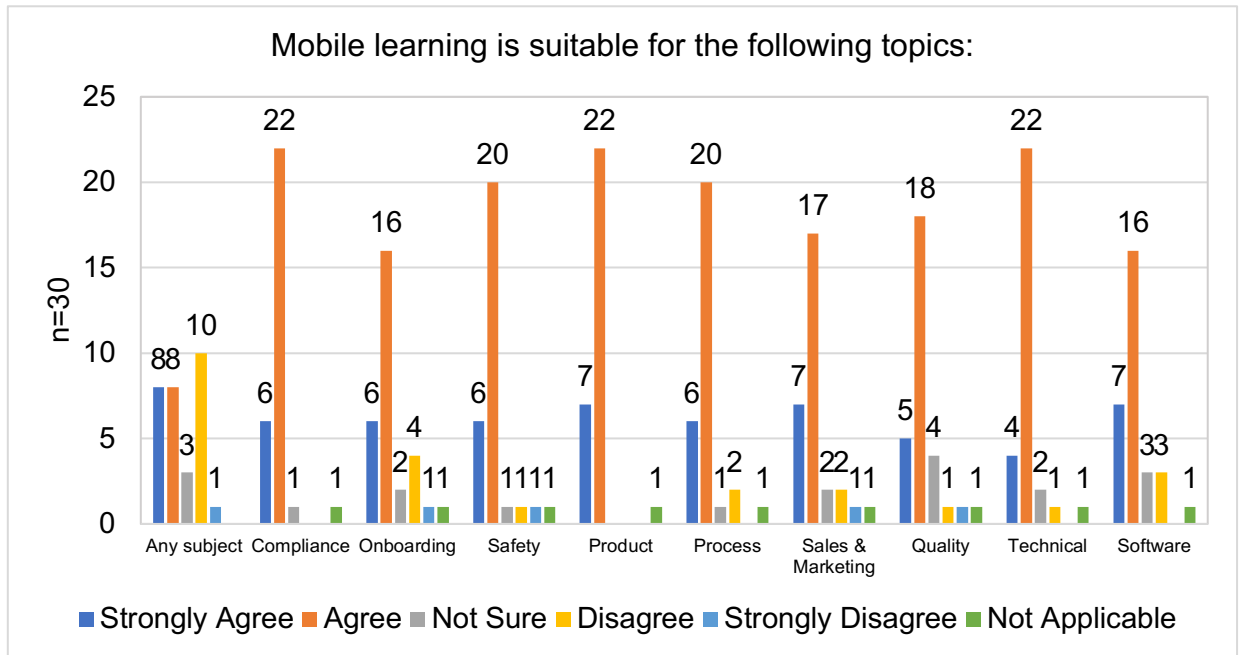


Figure 5.51 Mobile learning is suitable for stated topics

97% of the staff believed mobile learning is suitable for product training (Figure 5.51), while only one training manager felt mobile learning would be suitable for most topics, including product training.

Similarly, 94% of staff believed mobile learning is suitable for compliance training.

Most staff (87%) also believed mobile learning is suitable for safety training. 87% of staff believed mobile learning is suited for process training and for technical training (Figure 5.51).

Though 80% of staff believed selling skills could be imparted through mobile learning, both training managers felt soft skills like 'behavioural change'

programmes and sales and marketing training were best done in the classroom (Figure 5.51).

5.5.4.3 Technological Tools

“...tablets are preferable for mobile learning because they have a big screen.” – Training Manager 2

Both the training managers and staff felt the most appropriate mobile device (hardware) for mobile learning is the tablet, though smart phones also can be used.

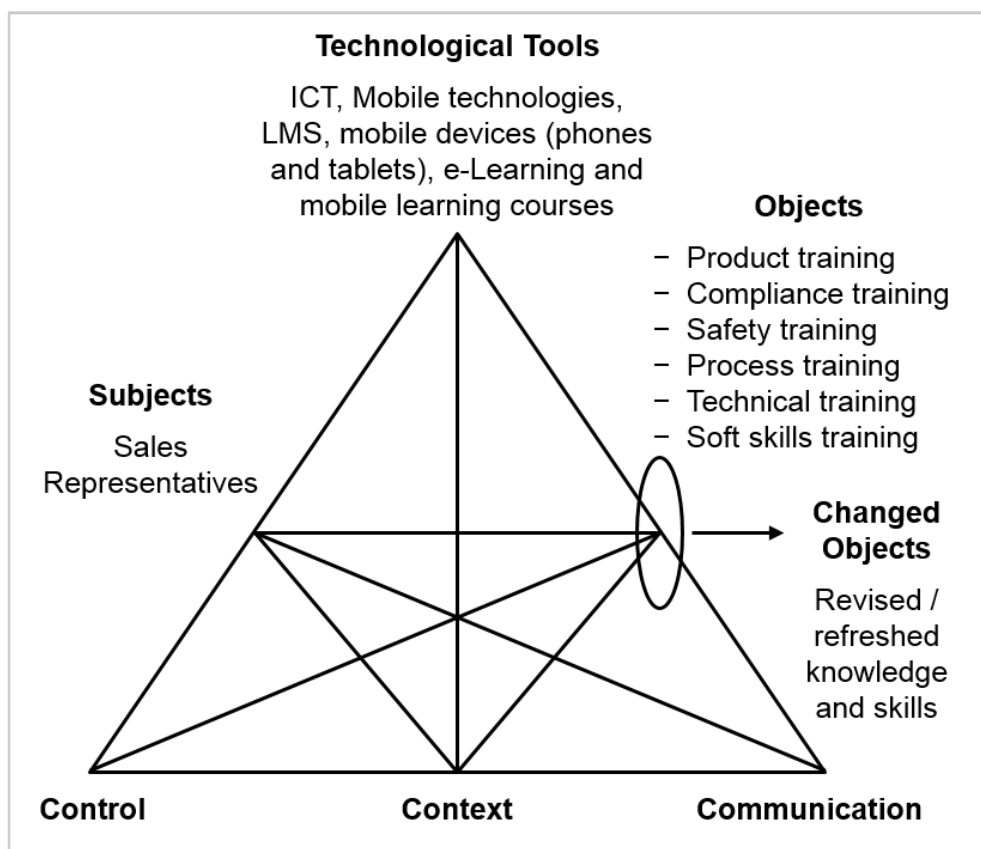


Figure 5.52 Mobile Learning within Sharple's Framework at Sun Finance – Technological Tools

93% of staff agreed that the tablet is the best technological tool to access learning, although 67% considered even smart phones an effective medium (Figure 5.53). While one training manager did NOT favour either of the two devices for mobile learning, labelling them “*miniaturised versions of what you see on a computer screen*”, the other training manager felt that for mobile learning, tablets score over smartphones since “*they have a big screen*”.

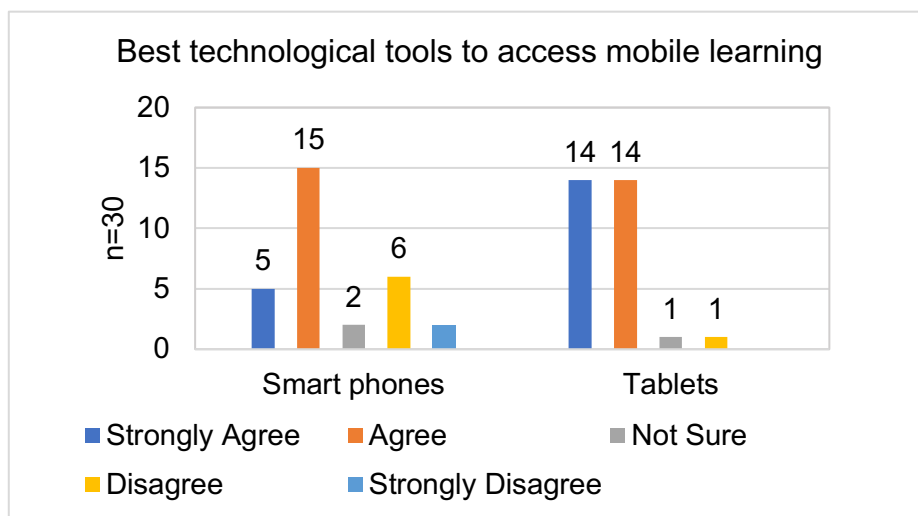


Figure 5.53 Best technological tool to access mobile learning

5.5.4.4 Context: Community and Locations

“The main community of mobile learning are the sales personnel.” –
Training Managers

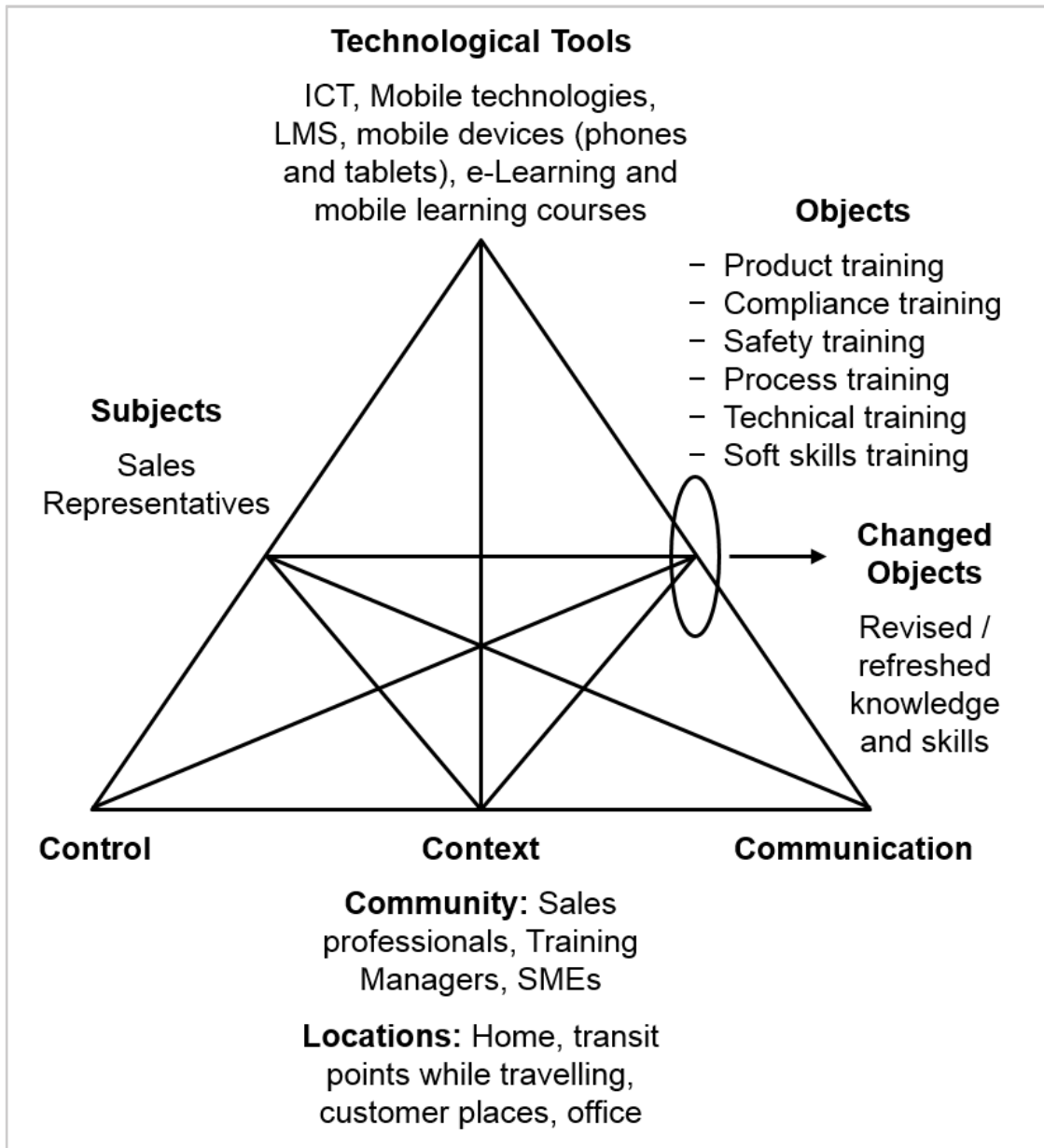


Figure 5.54 Mobile Learning within Sharples' Framework at Sun Finance – Context

Community

Although the main community for mobile learning is the sales personnel, training managers and SMEs also form part of the mobile learning community in this organisation.

Locations

Both staff and training managers agreed that the locations where mobile learning takes place vary widely.

The staff's most preferred locations for mobile learning are home (100%), office (93%), and transit points and places of recreation (87%) (Figure 5.55).

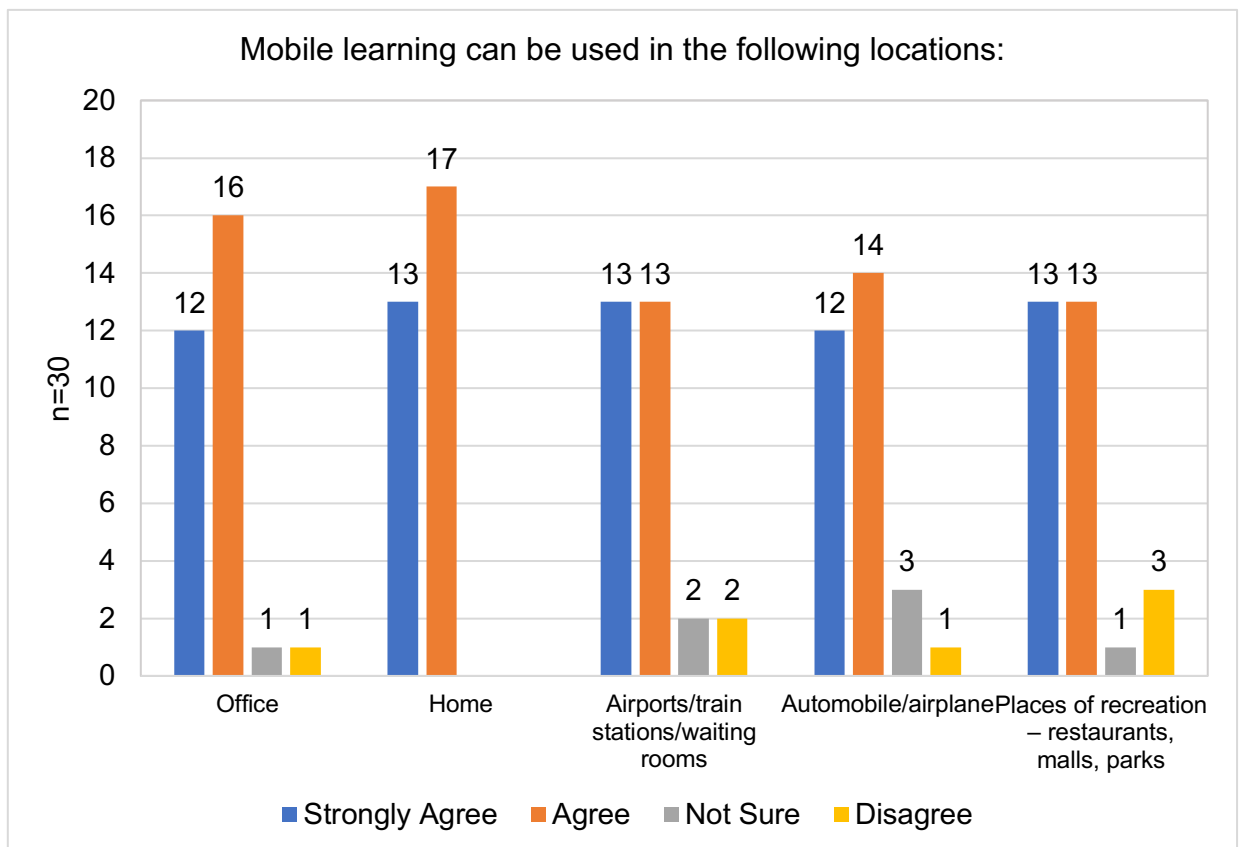


Figure 5.55 Best locations for mobile learning

While one training manager was not in favour of mobile learning, the other stated mobile learning can be undertaken anywhere.

5.5.4.5 Control: Technological Restrictions and Social Rules

“If everybody doesn’t have a device, that stops mobile learning.” – Training Manager 2

Most of the staff considered usability limitations of mobile devices, psychological resistance of stakeholders, and IT security and Internet bandwidth issues important barriers to mobile learning.

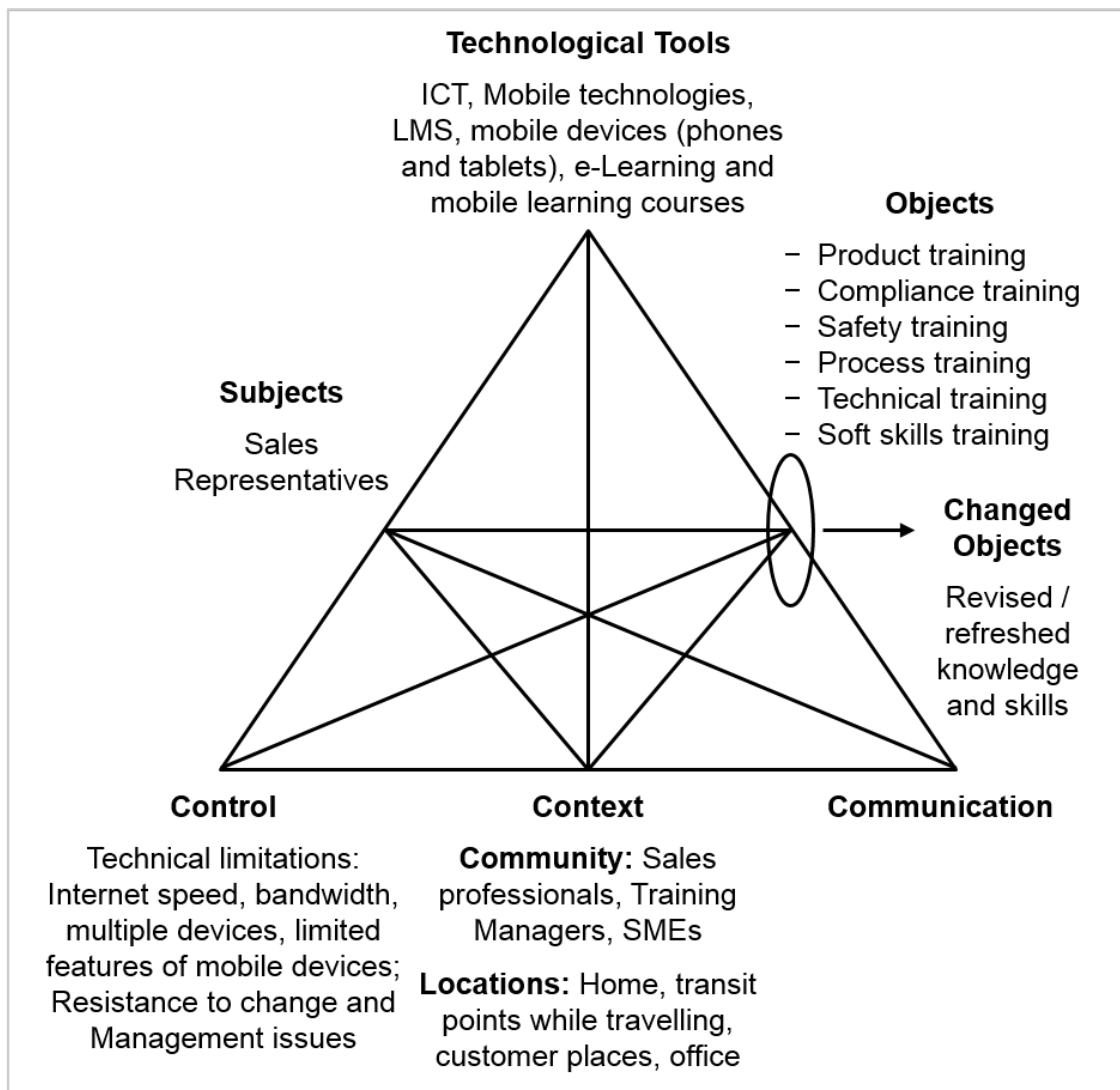


Figure 5.56 Mobile Learning within Sharple's Framework at Sun Finance – Control

The staff's views on the main restrictions to deployment of mobile learning are as listed below (Table 5.5):

Barriers to Mobile Learning	% Responses from Staff
IT Security issues	80
Financial/budget constraints	50
Psychological resistance of stakeholders	83
Technology issues (e.g. multiple devices)	77
LMS issues (tracking)	47
Usability limitations of mobile devices (screen size, Flash, incompatibility)	90
Internet bandwidth issues	80

Table 5.5 Barriers to mobile learning as per staff

One of the training managers considered 'technology' the top barrier – “the device not supporting the learning content”, staff not willing to use their “personal devices” to learn, and “IT security policies”. The other training manager also included internet bandwidth, technology issues, and people's mindset (“used to learning in a classroom”) as barriers, but thought this could be overcome, “Sun Finance is very forward thinking. So that's not a problem”.

The second training manager also observed that it is NOT so much the learner, but more of the “learning community” which could have “psychological resistance to mobile learning”.

Technological Restrictions

One of the biggest barriers to mobile learning is “usability limitations of mobile devices.” – Staff

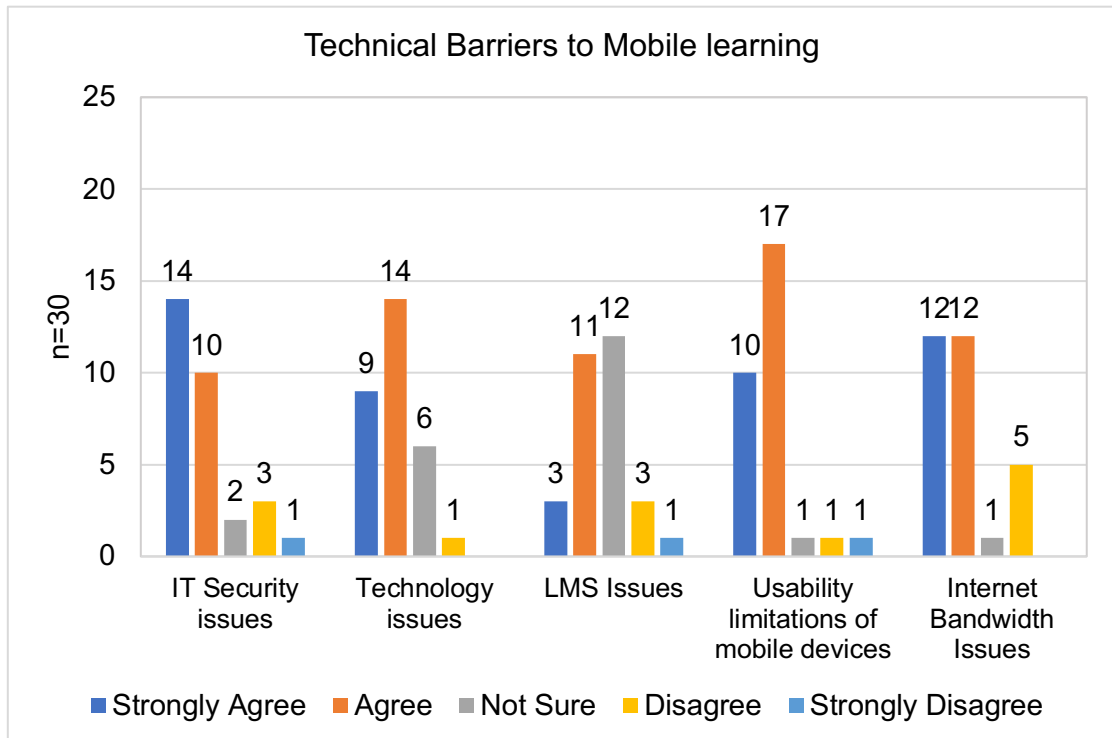


Figure 5.57 Technical barriers to mobile learning

Usability Limitations of Mobile Devices

Usability limitations of mobile devices were the top concern for 90% of staff.

(Figure 5.57). One of the training managers stated that regardless of the method used for learning – the LMS, internet portal, or App – the device should support it and learners should be able to access the learning. The second training manager agreed, stating that technology issues based on usability restrictions due to organisations not supplying tablets to the entire

work force, could be barriers because people without devices would be excluded from mobile learning.

Internet Bandwidth Issues

80% of staff and both the training managers believed Internet bandwidth issues could be potential barriers to mobile learning (Figure 5.57).

IT Security Issues

80% of staff believed IT security issues were also a barrier to mobile learning (Figure 5.57). One of the training managers agreed, stating there could be security concerns that may need to be worked through in the organisation. However, the other felt although there could be IT security issues, it is not a concern.

Technology Issues (Multiple Devices of Learners)

77% of staff and the second training manager thought technology issues such as multiple devices could also be barriers to mobile learning (Figure 5.57).

Social Rules

<p>“...there would be a need for logical investment backing” – Training Manager 1</p>

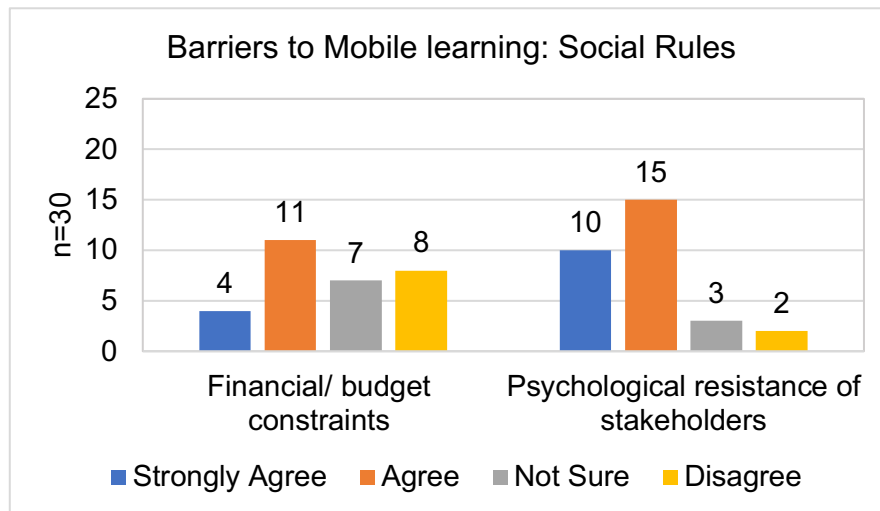


Figure 5.58 Barriers to mobile learning – social rules

Leadership Support

Though lack of leadership commitment was perceived by 50% of staff as an obstruction to the mobile learning initiative (Figure 5.58), 23% were not sure.

One of the training managers, clearly not very supportive of the online learning initiative, stated the leadership *“have been talking about mobile learning for over 10 years now and I have still not seen it”*.

The second training manager, on the contrary, was highly enthused about mobile learning, saying that at Sun Finance, *“people tend to think mobile learning is a good idea”*.

Resistance to Change

83% of staff thought psychological resistance of stakeholders is a barrier to mobile learning (Figure 5.58).

This is in stark contrast to the perception of the second training manager, *“It is easy to educate the staff as the Sun Finance leadership team don’t want to be technologically behind”*. Training Manager 1 felt that mobile learning will *“never replace more traditional classroom learning”*.

5.5.4.6 Communication: Channels and Conversations

“Because we have a geographically dispersed audience, we are going to need to interact collaboratively in a virtual classroom. So, I think collaborative mobile or face -to-face is usually better than e-learning.”

– Training Manager 2

Due to their perception of how e-learning is being used in the organisation, mobile learning is considered suitable only for individual, asynchronous learning.

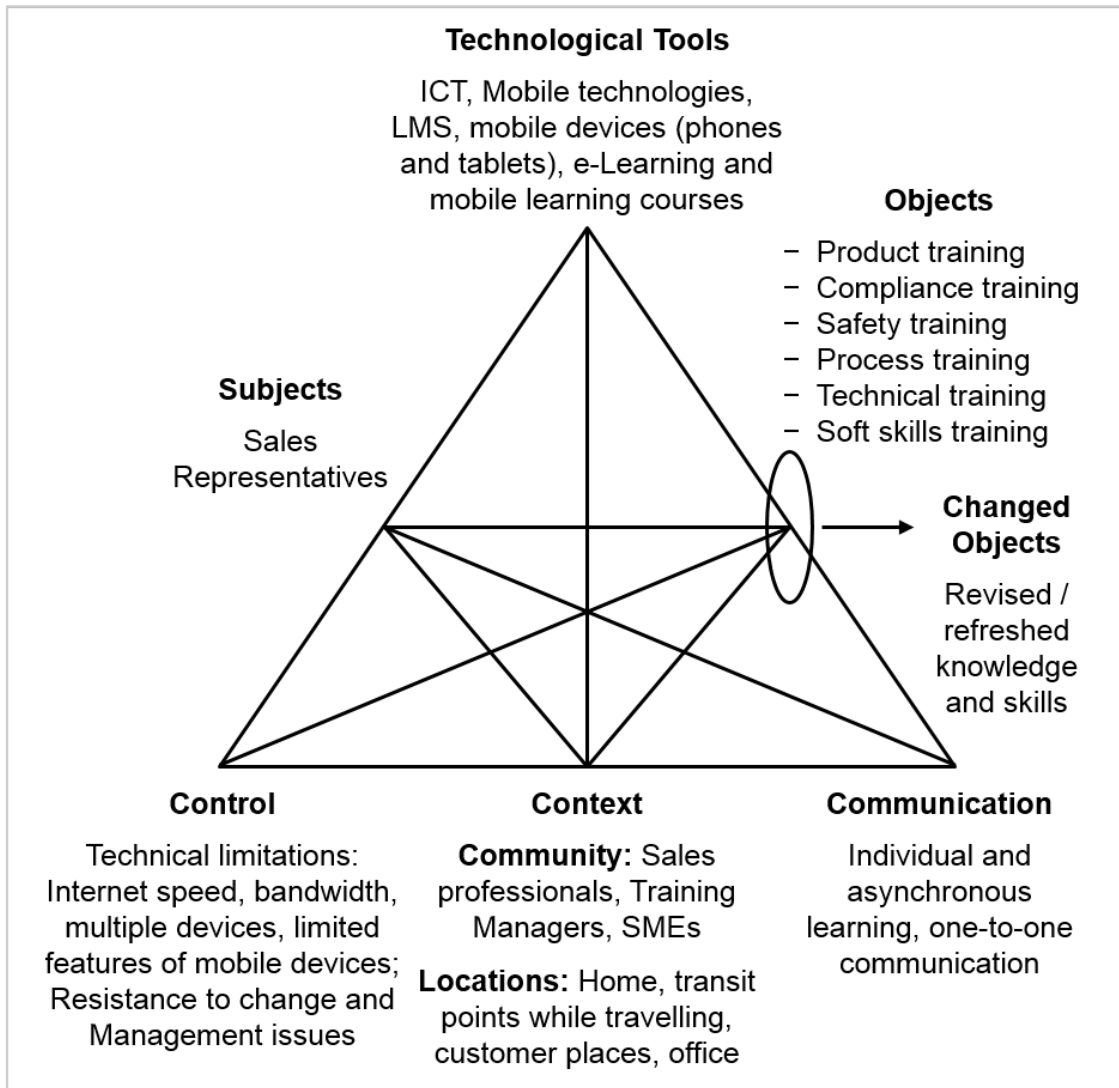


Figure 5.59 Mobile Learning within Sharple's Framework at Sun Finance – Communication

90% of staff thought mobile learning is good for individual learning, and 87% for asynchronous learning. Only 47% thought it could be used for collaborative learning (Figure 5.60).

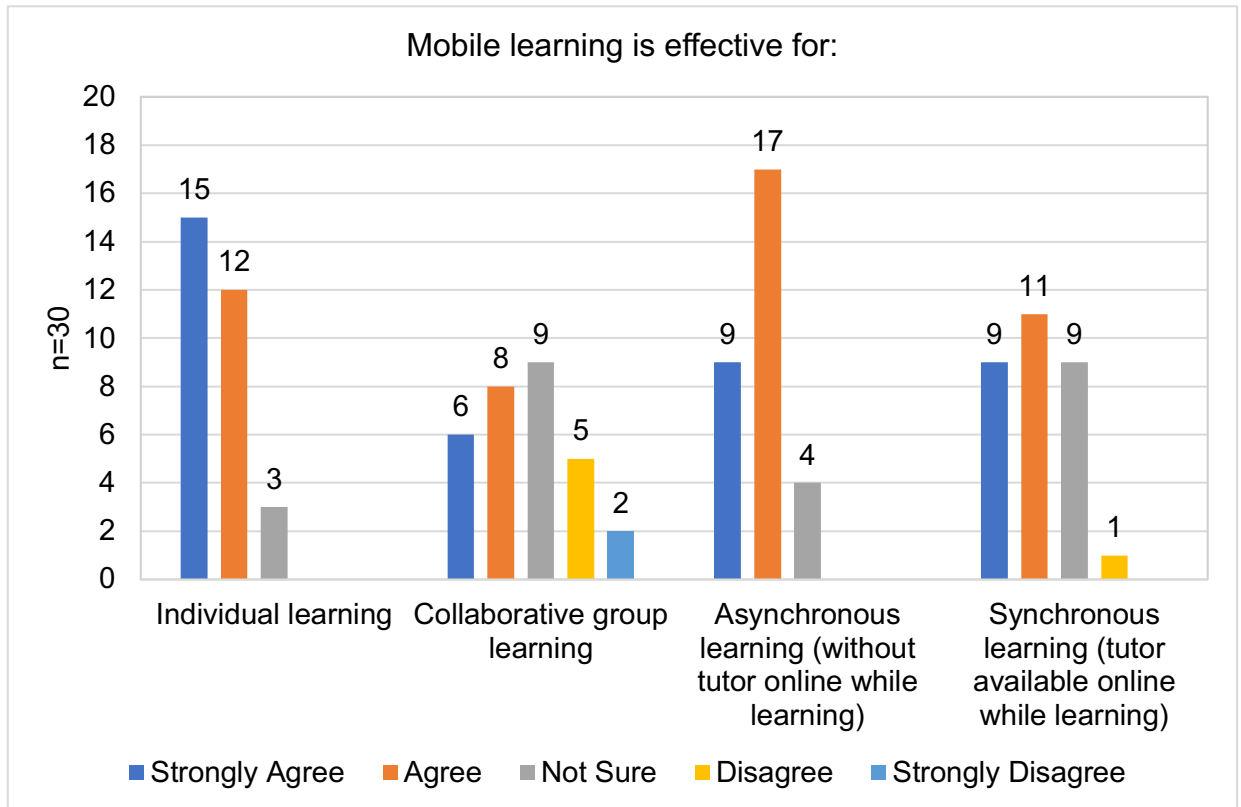


Figure 5.60 When is mobile learning effective?

Training Manager 1 felt “collaborative group learning” over a mobile platform “initially, might be too much of a jump for people to go to that level”.

Training Manager 2 felt collaborative learning is “necessary for now and the future”. To him, mobility and flexibility are more important for effectiveness than whether it is “synchronous” or “asynchronous”.

5.5.5 Mapping Mobile Learning Activity

The following is the mobile learning activity mapped on Mike Sharples' Framework.

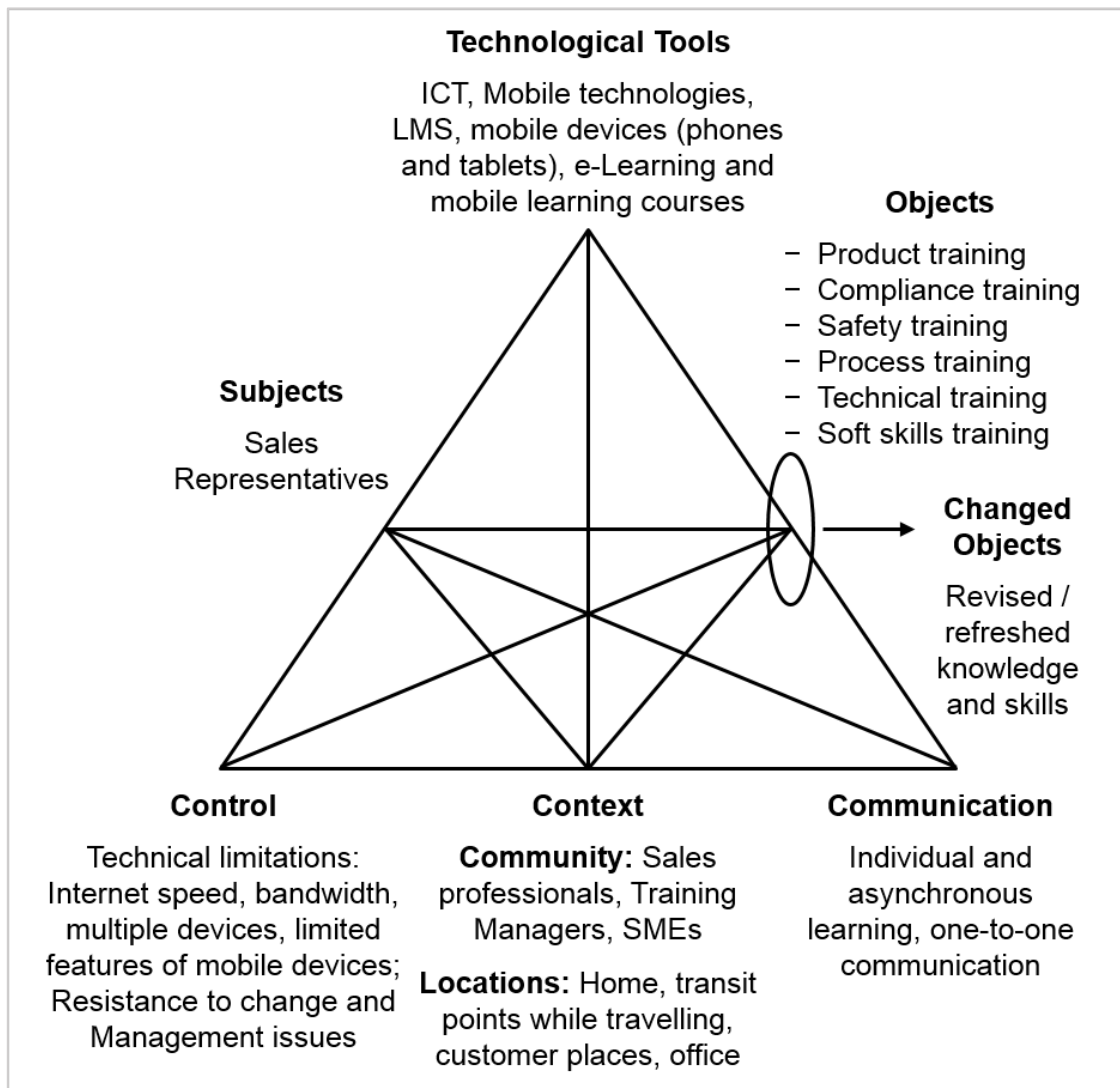


Figure 5.61 Mobile learning activity at Sun Finance mapped on Mike Sharples' framework

Subjects: The primary subjects are the sales representatives, both fresh recruits and experienced ones, who sell the company's financial products.

Object: The objects are refresher training on product training, compliance training, safety training, process training, and technical training. Changed objects are the revised knowledge and skills of experienced sales representatives whose feedback goes into revising the objects. However, in the absence of interactions with and contributions from learners, the objects did not evolve, and hence were not revised.

Technological Tools: Though the organisation does not have a formal mobile learning initiative, it uses Internet and communication technologies, LMS, and e-learning, and provides access to learning content via mobile devices. Tablets are preferred over smartphones due to their larger screen size.

Control: The organisation listed IT security issues, usability limitations, and internet bandwidth issues as major barriers. Financial constraints, resistance from management, and technological issues were also listed.

Context: Context includes locations and the community.

- **Locations:** Learning could take place in the homes of learners, at work, at transit points while visiting customers, or at customer sites.
- **Community:** The learning community primarily comprise sales representatives, along with training managers and SMEs.

Communication: Communication is considered suitable for individual asynchronous learning.

5.5.6 Tensions in Mobile Learning Activity

A few tensions were identified during the study between the elements of the Sharples' framework. Important ones are described below.

5.5.6.1 Subjects vs. Technological Tools

The learners felt constrained by usability issues (limitations of mobile device features, incompatibility of the content/tool), low Internet speeds and bandwidth issues, IT security issues, and difficulty of navigation on the LMS. Like in the case of ABT, there was the issue of BYOD too.

5.5.6.2 Subjects vs. Objects

There is a tension between what the staff and training managers felt about objects. While most staff felt that mobile learning was potentially suitable for any kind of topic, the training managers thought it should exclude behavioural training that required physical interaction between learners. Most staff considered mobile learning a form of e-learning but acknowledged it gave them freedom to access learning (objects) while on the move. However, there were considerable differences in how the training managers perceived mobile learning. While one viewed it as online learning via a mobile device and was extremely guarded about its potential, the other was extremely positive. One had reservations about the efficacy of online learning (mobile or e-learning) vis-à-vis classroom training, while the other considered mobile learning suitable for all topics except soft skills. In other words, there is widespread

disagreement in this organisation between different stakeholders about what the object of mobile learning really is.

5.5.6.3 Subjects vs. Controls:

In addition to the technological limitations, learners were constrained by resistance to change and management issues. A major roadblock to widespread implementation of mobile learning was perceived to be lack of quantifiable benefits as perceived by management, affecting budget for its implementation. This tension broadly reflects that found in PCI (see *section 5.4.7.3*).

5.5.6.4 Subjects vs. Communication

The main communication is between the individual learner and objects accessed through the technological tools. Both the training managers and staff thought mobile learning is suitable for individual and asynchronous learning, with staff yet to experience collaborative communication. But the potential of mobile learning for collaborative learning is recognised as a future possibility. As in ABT (see *section 5.3.7.4*), there is clearly a difference between the stated beliefs of respondents and the actual practices in the organisation.

5.5.7 Key Objectives Being Sought in the Organisation

Mobile learning is “freedom and flexibility of learning anytime and anywhere. It’s not only useful for any geographic location but also for any generation. Interestingly, though millennials will be more interested in it, even the senior employees accept and welcome it.” – Training Manager 2

Though Sun Finance has been using mobile learning to a small extent since a few years, no formal initiative to implement mobile learning was taken up, according to Training Manager 1 – *“I don’t believe there is a formal mobile learning initiative. I think it has been investigated, and products also have been built but I don’t think there has been a full initiative designed specifically for mobile”*. However, it should be noted that the company has been using e-learning along with classroom training since long.

However, Training Manager 2 and most of the staff were very positive about the prospects of mobile learning initiatives, especially on its potential reach, cost-benefits, and effectiveness.

The main benefit of mobile learning is its ability to reach many people. 97% of staff thought mobile learning could reach *“many people, anywhere”* (Figure 5.62). According to Training Manager 2, the staff considered mobile learning is *“making their life easier and better ... by giving them the power to participate in learning even when on the move”*.

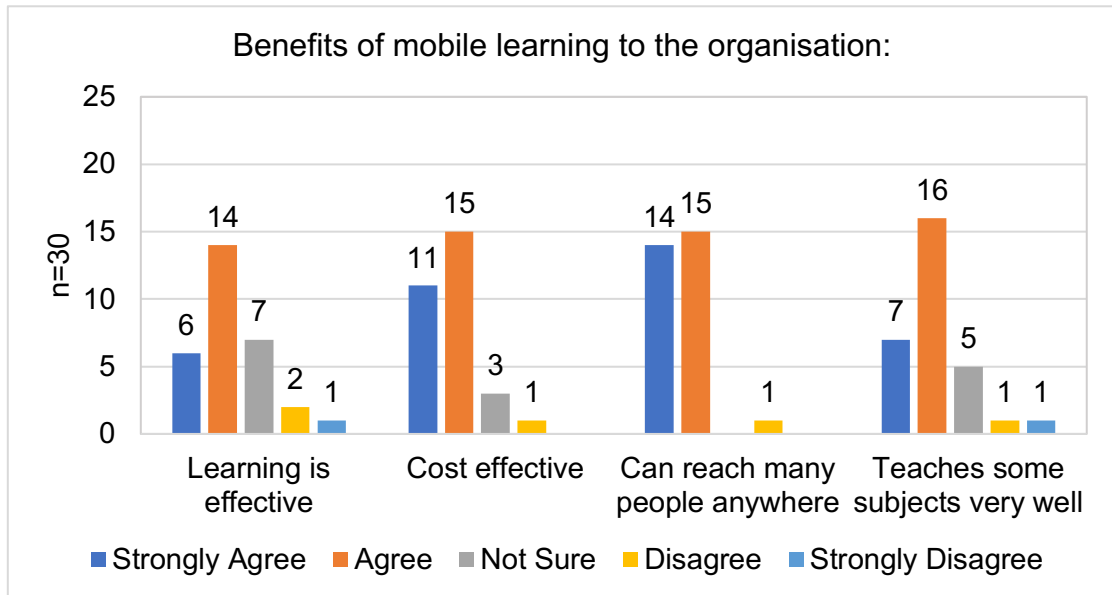


Figure 5.62 Benefits of mobile learning to the organisation

Mobile learning is considered effective, both in terms of cost and learning. Most staff (87%) thought the benefit is “cost effectiveness” (Figure 5.62). 67% of staff considered mobile learning effective, and 76% felt it teaches some topics very well (Figure 5.62). Training Manager 2 felt its effectiveness lay in its “flexibility and access...providing easier ways for people to learn” and being a “just-in-time” tool.

Mobile learning is also considered effective in many areas (Figure 5.63 and Table 5.6), providing new skills to learners, increasing chances of promotion, helping identify strengths and weaknesses, enabling exchange of ideas, and improving business knowledge.

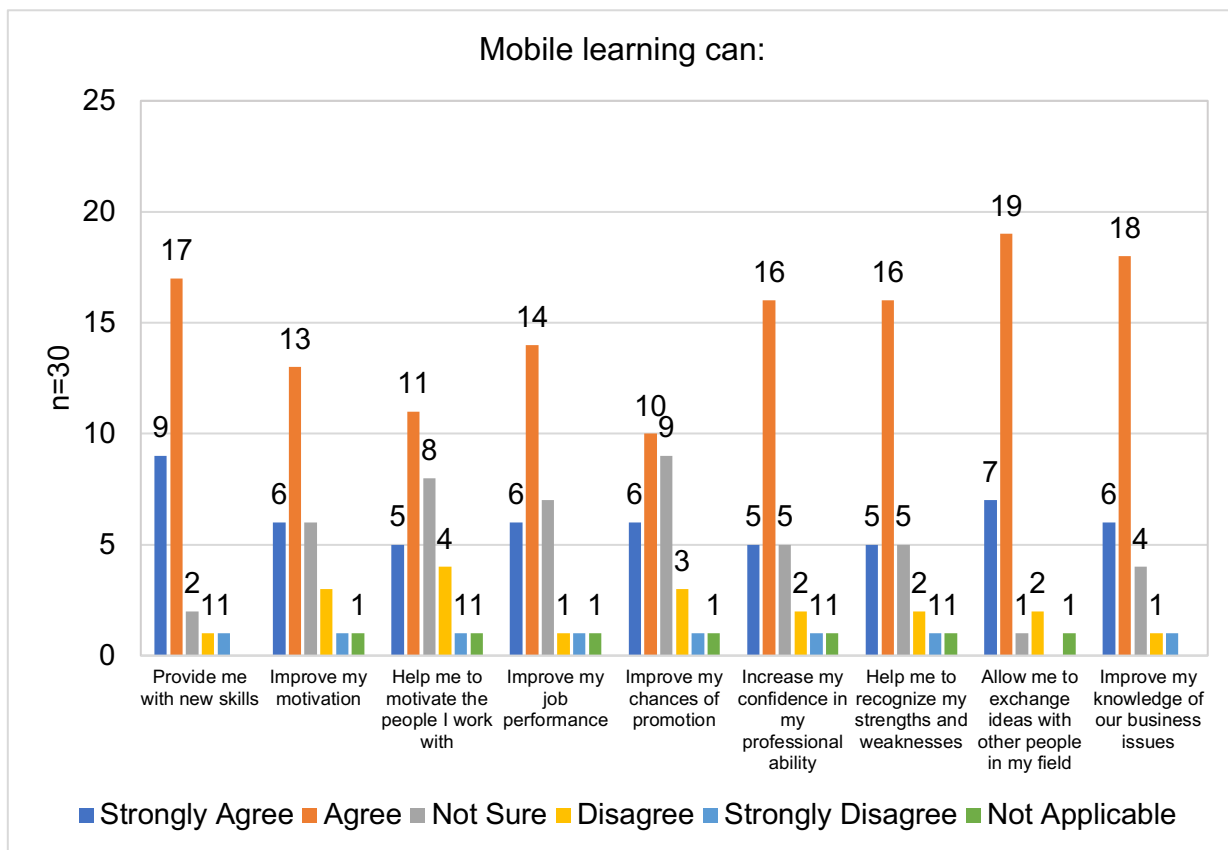


Figure 5.63 What mobile learning can do

Mobile Learning	% Responses from Staff
1. Inculcates new skills	87
2. Improves motivation	63
3. Helps motivate others	53
4. Improves job performance	67
5. Improves chances of promotion	53
6. Increases professional confidence	70
7. Helps identify strengths and weaknesses	70
8. Facilitates exchange of ideas	87
9. Improves business related knowledge	80

Table 5.6 Effectiveness of mobile learning

Mobile learning is also considered convenient as it overcomes the barriers of time, location, immediacy, and the inability to devote longer time to learning.

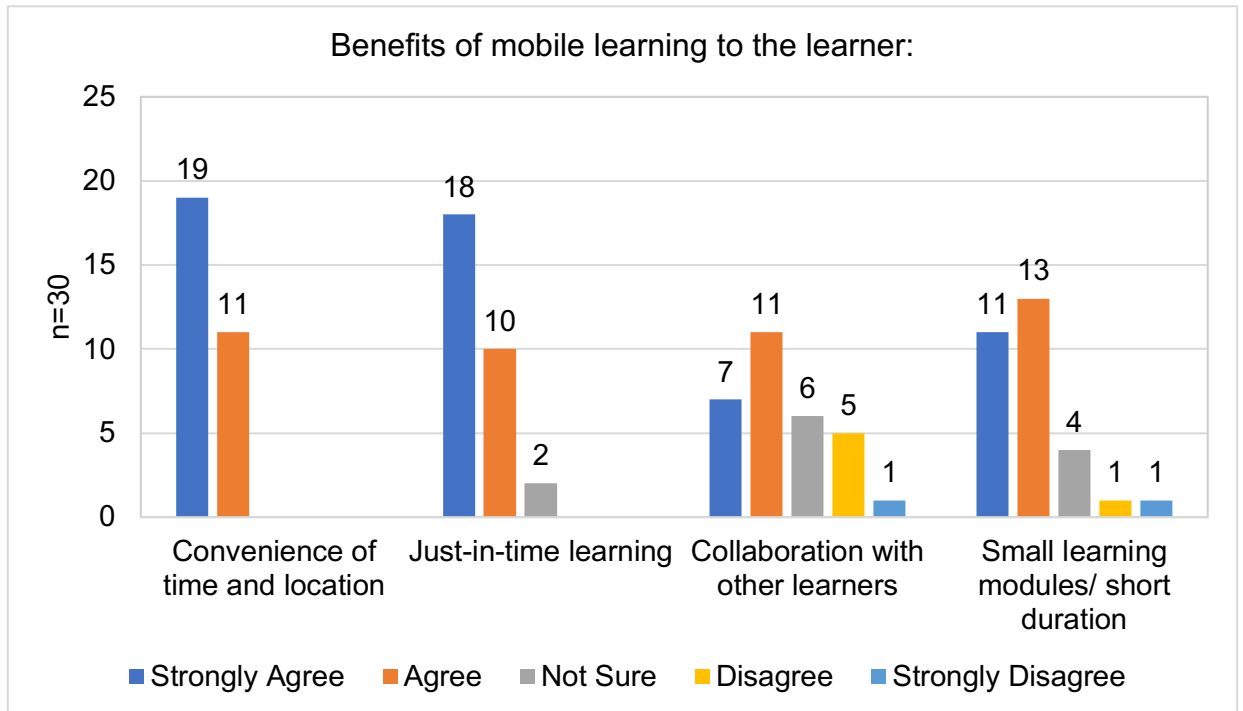


Figure 5.64 Benefits of mobile learning to the learner

The staff thought mobile learning offered the “convenience of time and location”, 93% equated convenience to “just-in-time learning”, and 80% to “small learning modules and short duration”, while 60% thought it is “collaborative” (Figure 5.64).

5.6 Cross-Case Analysis

5.6.1 Introduction

This section gives an analysis of the findings from the three case studies by drawing out the similarities and differences among the organisations studied.

In the cross-case analysis, I examine how training managers and staff (sales and service) experience the adoption of mobile learning in their organisations where e-learning is already firmly established, their perceptions of what mobile learning is and its relationship with wider e-learning practices, their perspectives of what their respective organisations are seeking to achieve through mobile learning (reasons for adopting mobile learning), the dynamics of the actual practice of mobile learning (mapped against the backdrop of Sharples' framework), and the barriers to the adoption of mobile learning. Through this analysis, I come up with a consolidated view of the perceptions and dynamics of practices specific to each organisation and the more common assumptions/findings across all three organisations.

5.6.2 Relationship to Established E-learning Provision

Across the three organisations, the relationship between established e-learning and mobile learning was viewed to be a close one when it came to it being a part of e-learning. However, the two were viewed as not being the same, yet at the same time, not entirely different either.

When it came to considering mobile learning as a part of e-learning, most of the sales and service staff respondents at all three organisations felt mobile learning is a part of e-learning. At ABT and PCI, the points of difference were the location of learning, type of device, and the kind of content. However, in the case of Sun Finance, the points of difference were to do with location of learning, range of technologies to access content, and technological tools used to access learning. According to training managers at ABT, e-learning and mobile learning were thought to be more closely related than classroom training and e-learning, with technology being the binding factor between e-learning and mobile learning.

The majority of the sales and service staff respondents at all three organisations also felt that mobile learning is NOT the same as e-learning. However, the training managers at PCI had differing perspectives – one terming it “online learning”, the other as not only totally different from e-learning, but also associating with it with an element of excitement. But the consensus was that mobile learning is “exciting, engaging, and interactive”.

When it came to mobile learning being entirely different from e-learning, again, the majority of staff respondents at all three organisations agreed that mobile learning is NOT entirely different from e-learning. However, at PCI, the training managers believed e-learning and mobile learning were very different. At Sun Finance, it seems although the staff recognised them to be different,

they could not envisage how mobile learning could be used differently as there is no formal mobile learning initiative.

It appears that in general, across all three organisations, mobile learning is being implemented as part of e-learning, which is possibly the reason why mobile learning is NOT perceived as an entirely new way of learning.

Although at the same time, there is marked clarity in respondents on how these two were different despite their close relationship. This seeming contradiction could perhaps be because mobile learning initiatives are built on the e-learning infrastructure. I feel my choice of organisations impacted these findings. Had I analysed organisations that had already deployed mobile learning for some time, and where it had achieved mature adoption, these findings might have been significantly different.

5.6.3 Key Aspects of Mobile Learning Understood in the Organisation

I commenced my analysis of the case studies by focusing on those aspects associated by respondents at each organisation with mobile learning because it gives insights into whether their definition of mobile learning has to do with the mobility of the learners, the device, or both, and also their perceptions on what constituted a suitable device. The respondents' perception of what constitutes mobile learning is instrumental in understanding this initiative, with findings showing only minor variations in their understanding.

According to the participants in all three organisations, the key aspects of mobile learning are that learning happens while the learner is mobile, when

the learner is using any mobile device, and when the learner is using any mobile device *while on the move*.

In all organisations, the mobility of the learners comes out as a key aspect of mobile learning.

Coming to the device, respondents in all three organisations felt mobile learning was “learning through any mobile device”, the size of the device not important as long as it could be used by learners while on the move. One training manager also felt mobile learning can happen “on any suitable device including a laptop”. But another training manager felt mobile learning “has to be device agnostic for most part”. Most of the staff however felt mobile learning is “learning through a mobile phone”. This is interesting because it would appear that the choice of device was irrelevant as long as learners could access content while not being tethered to a physical location.

5.6.4 Key Objectives Being Sought in the Organisation

In my analysis, I focused on the advantages of mobile learning because that gives us insights into why each organisation opted for deploying/wanting to deploy mobile learning, and how they perceive the benefits and limitations of mobile learning. This would help us determine the main objectives for implementing mobile learning or shed light on why mobile learning is not being deployed. There was substantial overlap in the three organisations on mobile learning achieving multiple objectives. Respondents were extremely

enthusiastic about its future prospects, especially its potential reach, cost benefits, and effectiveness.

All three organisations saw its main benefit as its ubiquity and ability to reach a large number of people.

However, there were differences regarding its cost benefit. While respondents from ABT and Sun Finance felt one of the main benefits was its cost benefit, those from PCI and Sun Finance felt it was also the ability of mobile learning to deal with varied content.

While all three organisations concurred on the ease and effectiveness of mobile learning, they cited different reasons because the objectives sought by each of them differed. While respondents at ABT saw mobile learning as the "best method to teach something new quickly, that is more than a job aid or performance support", respondents at PCI saw it as "learning and a kind of job aid". Respondents at Sun Finance saw it is effective because "there was no extraneous information they had to sit through to find what they needed".

Coming to the overall effectiveness of mobile learning, most respondents felt it facilitates exchange of ideas, improves job performance, inculcates new skills, and overcomes the barriers of time, location, immediacy, and inability to devote longer time to learning. Some thought it was "collaborative" as well. However, my findings show that the differences in objectives being sought have interesting implications because it appears each organisation favoured a

certain objective over another – possibly driven more by business realities than the actual multiple benefits of mobile learning.

5.6.5 Dynamics of Mobile Learning Practice

I analysed my findings for each study using the components of Sharples' framework of mobile learning, as this gives insights into how each component influences how mobile learning is actually used in practice, thus preventing or delaying its more extensive usage. That is important for analysing the dynamics of mobile learning in use in each organisation by situating each case study in a specific context.

In this section, I have compared the findings across the three case studies by using each component of Sharples' framework of mobile learning in turn to illustrate where the enabling and restraining factors come into the picture across all three organisations, and if there are any specific ones that open up avenues for further research. I found there was a high degree of commonality among the organisations for most of the components studied, but also a bit of interesting variation, when it came to the training managers' responses to objects, suitability of mobile learning to teach any topic, controls (in terms of social rules) and communication (ability to visualise a collaborative aspect to mobile learning even if it was not being practiced).

5.6.5.1 Subjects

The subjects (learners) at all three organisations were salespeople, with one of them also including service staff.

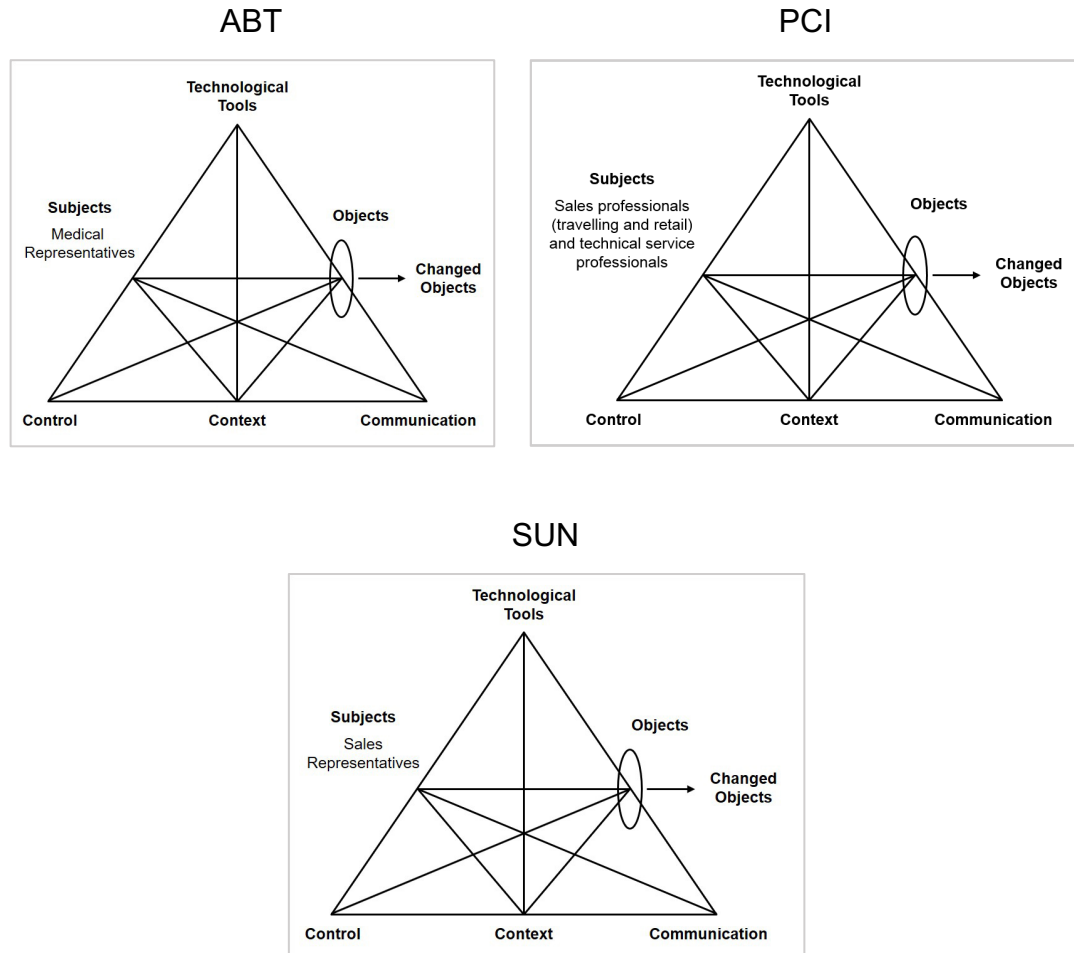


Figure 5.65 Learners for mobile learning

At ABT, the subjects were medical representatives and their senior colleagues, typically with undergraduate degrees in life sciences, chemistry, or pharmacy. At PCI, the subjects were sales personnel; those selling high-end computers and servers directly to corporate customers had engineering and computer backgrounds, and those selling at retail chains were millennials and mostly high school graduates. The subjects at Sun

Finance were sales professionals with an undergraduate degree in commerce, arts, or management, selling the company's financial products to individuals and organisations.

Most of the subjects' jobs involved travelling, with a lot of waiting time in transit. Most subjects in all three organisations felt that mobile learning has a broad applicability – being suitable for all kinds of learners and not favouring any one type. Interestingly, even the millennial respondents (at PCI) felt it did not favour any learning type. Also, unlike the travelling respondents, they accessed mobile learning at fixed locations, so this didn't really influence how they perceived the mobility of the learner as being integral to mobile learning as long as it was accessed through any mobile device. I don't think the learner's mobility was specifically recognised by organisations, so this throws up interesting questions on why they still associate mobility of the learners as a key aspect of mobile learning as noted in *5.6.3 Key Aspects of Mobile Learning Understood in the Organisation*.

5.6.5.2 Objects

There is consensus among all three organisations that mobile learning is ideal for performance support.

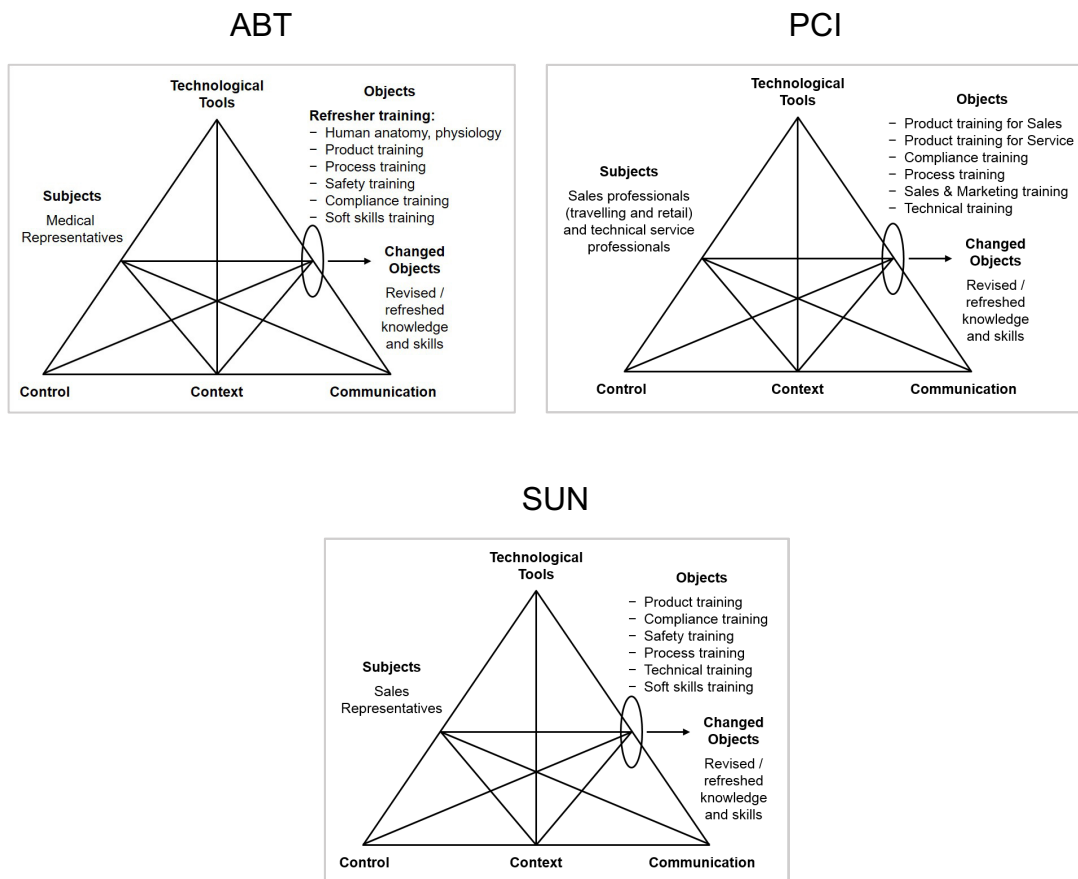


Figure 5.66 Mobile learning Usage

ABT uses mobile learning primarily to deliver “refresher” training for its knowledge base, products, and processes; PCI for product training and technical service training; At Sun Finance, mobile learning is also used to build on primary classroom training before salespeople go out into the field, and for performance support as well.

Findings at all three organisations show high concurrence because the majority felt although mobile learning could teach any topic (while the training managers disagreed), it is most effective for compliance, product, process, and sales and marketing training. It was felt that mobile learning is used primarily as performance support and job aids rather than traditional learning.

The training managers at ABT felt mobile learning is not suitable for complicated “serious and heavy” topics and for first time learning which needs to be done in the classroom or through e-learning. They felt mobile learning is ideal for topics that can be easily absorbed and immediately applied to resolve work-related issues. Similarly, PCI training managers felt mobile learning is more suitable for any topic requiring immediate access to knowledge, and not for those that had to be studied in detail. One of them also suggested it can be used to pique learners’ interest for in-depth e-learning. Sun Finance training managers believed mobile learning is ideal for topics requiring immediate access to knowledge, but not for leadership or behavioural training.

Respondents in all three organisations agreed that mobile learning was suitable for product, process, compliance, safety, and quality training. The interesting findings were to do with sales and marketing training – with staff at ABT and Sun Finance believing that selling skills *can* be taught through mobile learning, while their training managers felt it is not a good idea to use mobile learning for soft skills training.

All these findings, especially those to do with mobile learning being perceived as most suitable for performance support rather than for primary training, could be a reflection of the business objectives of each organisation rather than of what has been tried and tested and found wanting.

5.6.5.3 Technological Tools

When it comes to technological tools, the technical forms of the content and the intended devices are common elements across all three organisations. All the organisations host their learning content (PowerPoint decks, PDFs, infographics, videos, and podcasts) on their servers and LMS. This uniformity in the type of learning content could have implications on how mobile learning can be deployed in the future as well.

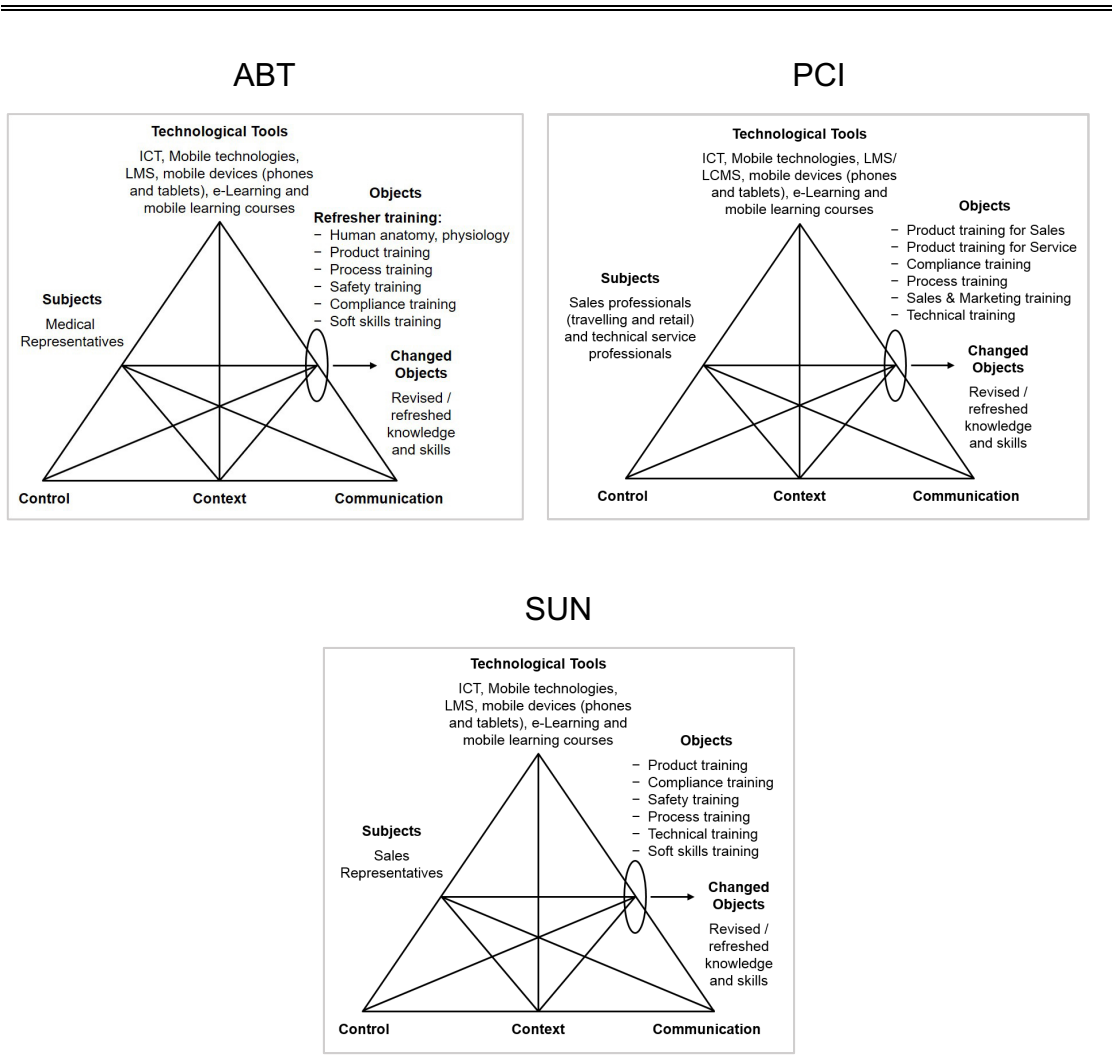


Figure 5.67 Technological Tools used in Mobile learning

One of the organisations uses an LCMS to curate and deliver content, especially proprietary content related to its products and services. Learners first learn through e-learning and take it forward with mobile learning completing the learning cycle or take the initial learning on a mobile device and then complete it through more detailed e-learning.

When it came to the mobile device, most respondents thought the most appropriate mobile device for mobile learning was the tablet. This again has implications on how widespread mobile learning will be because the actual

practice in the corporate sector shows that some organisations have a BYOD policy in place, and the use of multiple devices can be a restraining factor for mobile learning.

5.6.5.4 Context: Community and locations

The context includes members of the learning community and the various locations at which subjects access mobile learning. The learning community includes stakeholders other than subjects who impact the adoption of mobile learning. The locations help underline the ubiquity of mobile learning. There is a high degree of commonality across the three organisations in both.

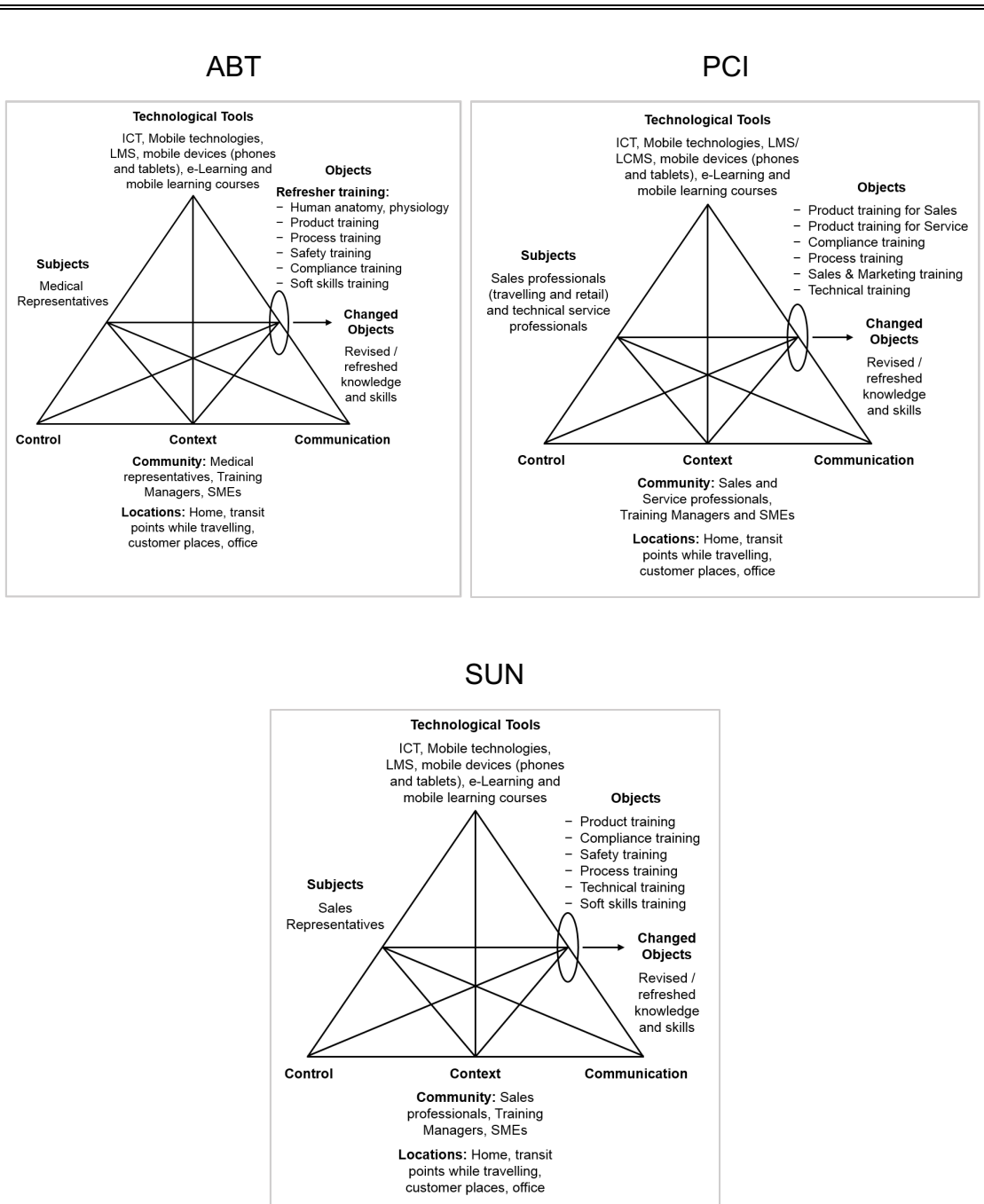


Figure 5.68 Members of learning community and locations for access

Community

In all three organisations, the main community for mobile learning comprises sales personnel (and service personnel in the case of PCI), in addition to their managers and subject matter experts.

In ABT, the salespeople are medical representatives, while at PCI and Sun Finance, they are sales executives; all essentially in sales related jobs. The community also includes technical service personnel. Other members of the community are SMEs involved in developing course content on various topics, and training managers, responsible for training marketing and sales staff.

The training managers at ABT believed sales personnel who are on the move most of the time would benefit greatly from mobile learning, as they could access learning modules just-in-time.

Locations

Respondents from all three organisations felt mobile learning could be successful in any location. They agreed that the locations where mobile learning takes place are varied, with home (or hotel), followed by transit places such as airports, bus stations, and reception rooms of customers.

5.6.5.5 Control: Technological Restrictions and Social Rules

Control is exerted both by technological restrictions as well as by the environment in terms of resistance of stakeholders and people. There is some variation among the three organisations when it comes to a few technological restrictions (usability limitations of mobile devices and LMS issues).

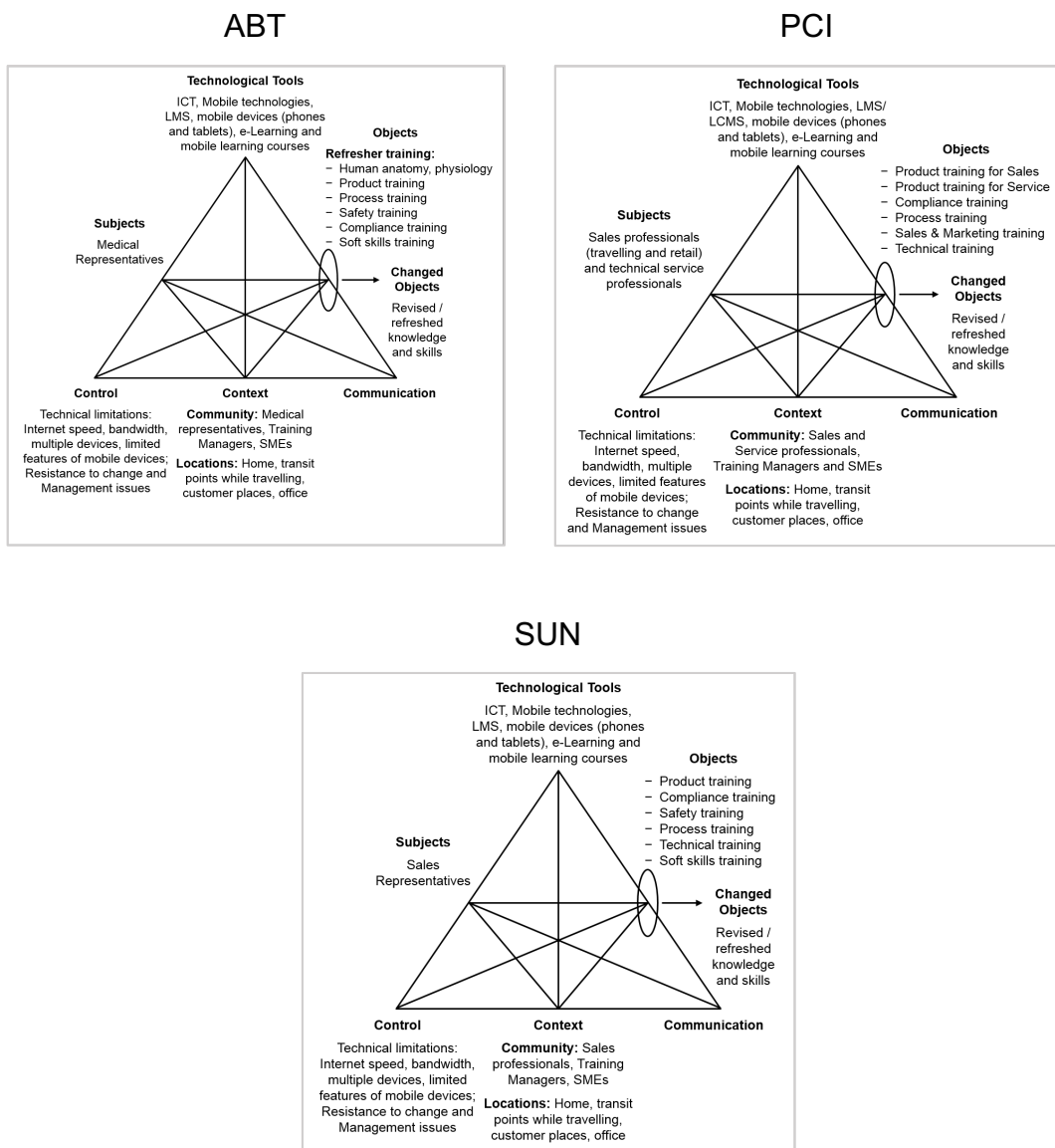


Figure 5.69 Technological and social restrictions

At PCI, the top barriers to mobile learning were Internet bandwidth issues but one of the training managers felt the biggest barrier was the management being unaware of the benefits of mobile learning.

At Sun Finance, psychological resistance of stakeholders was felt to be the second biggest barrier to the use of mobile learning, followed by Internet bandwidth and IT security issues.

Technological Barriers

Internet bandwidth issues were among top concerns for both types of participants in all three organisations. At Sun Finance, usability limitations of mobile devices were the top concerns only for the staff. The staff across all three organisations were unanimous that IT security issues were a barrier. Both staff and managers at all three organisations listed learners using multiple devices as one of the problems. This has implications for organisations that do not provide their staff a standard mobile device for training.

When it came to LMS issues, half the staff at ABT and PCI felt LMS did not pose a significant problem in mobile learning, while most of the staff at Sun Finance felt that LMS issues could also be a barrier to mobile learning.

Social Rules

Any learning environment is influenced heavily by certain social factors. This comprises both lack of leadership support and resistance to change. There was high concurrence among respondents for both (except for one manager who differed slightly with the rest on both counts). My findings show that social rules play a very crucial role in the actual practice of mobile learning, even though theoretically, most organisations acknowledge its benefits.

Leadership Support

Respondents across all three organisations felt leadership support is important for the success of mobile learning, as senior management's restrictions on budgets for mobile learning and lack of leadership commitment were important issues.

The training managers at ABT felt that although their leadership was positively inclined, it was still not convinced on its return on investment. One of the training managers at Sun Finance (not very supportive of the online learning initiative) agreed, saying that the leadership team had NOT made concrete efforts towards adopting mobile learning and that senior stakeholder willingness to invest was needed. The other manager at Sun Finance, however, was highly enthused about the prospects of mobile learning. He believed there was tacit support for mobile learning.

Resistance to Change

The majority opinion was that psychological resistance of stakeholders was a barrier to mobile learning.

The training managers at ABT thought this resistance showed in the time taken by SMEs to get the course content ready. At Sun Finance, there were differing opinions among the training managers with one of them doubting the leadership's commitment to mobile learning, while the other was very optimistic about their commitment.

5.6.5.6 Communication: Channels and Conversations

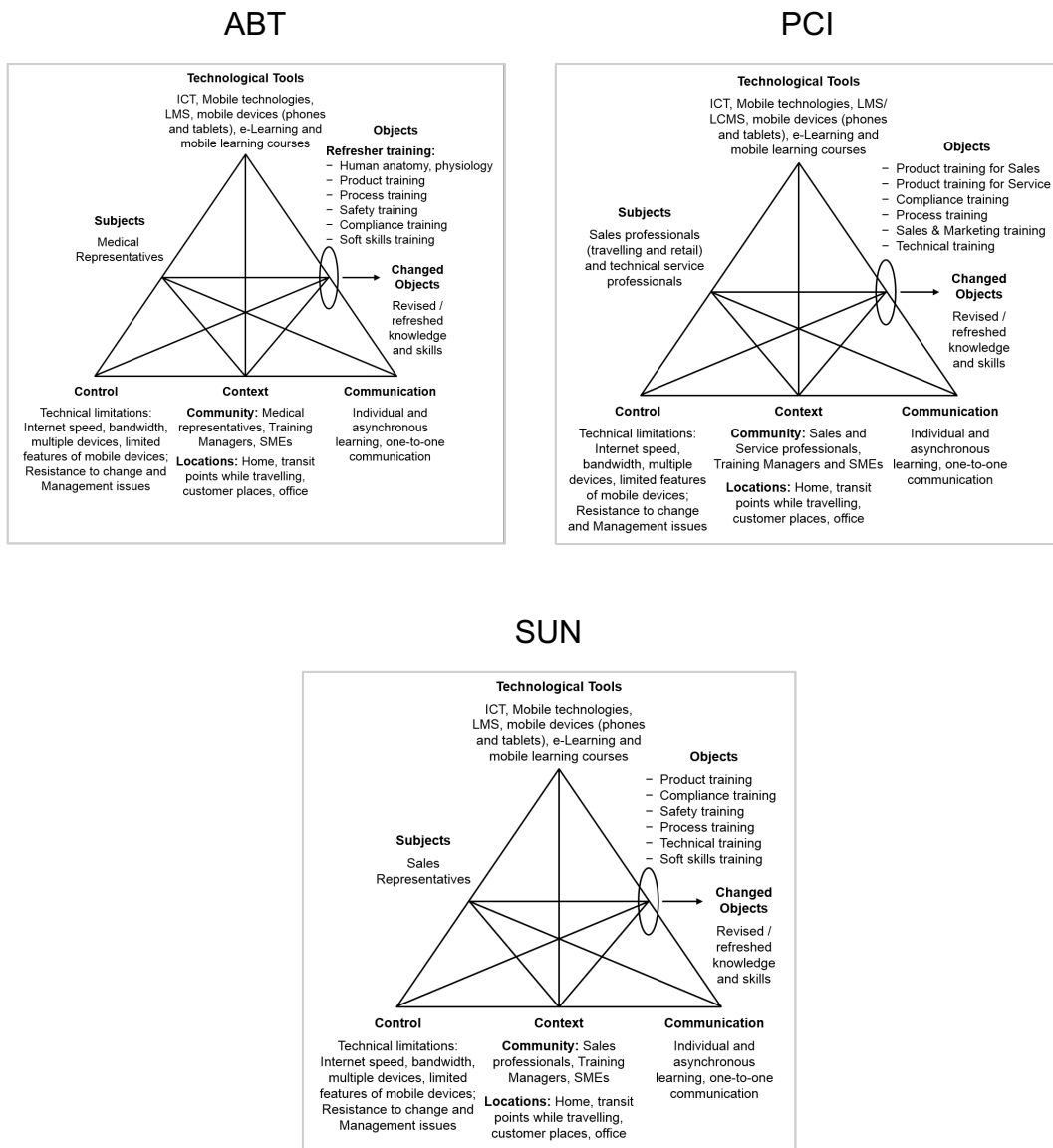


Figure 5.70 Communication and Collaboration in mobile learning

Respondents in all three organisations viewed mobile learning as suitable for individual asynchronous learning, restricting interactions to those between the objects and learners, with no collaborative interaction. Training managers at ABT were unable to visualise a collaborative aspect to mobile learning. However, they, along with those at Sun Finance, were open to the idea of a

collaborative platform even though the latter felt that “initially, it might be too much of a jump for people to go to that level”.

5.6.6 Mapping Mobile Learning Activity

Below is the consolidated figure across all three case studies, mainly showing the points of commonality. The differences are in the subjects and slight variations when it comes to objects and controls (technological limitations).

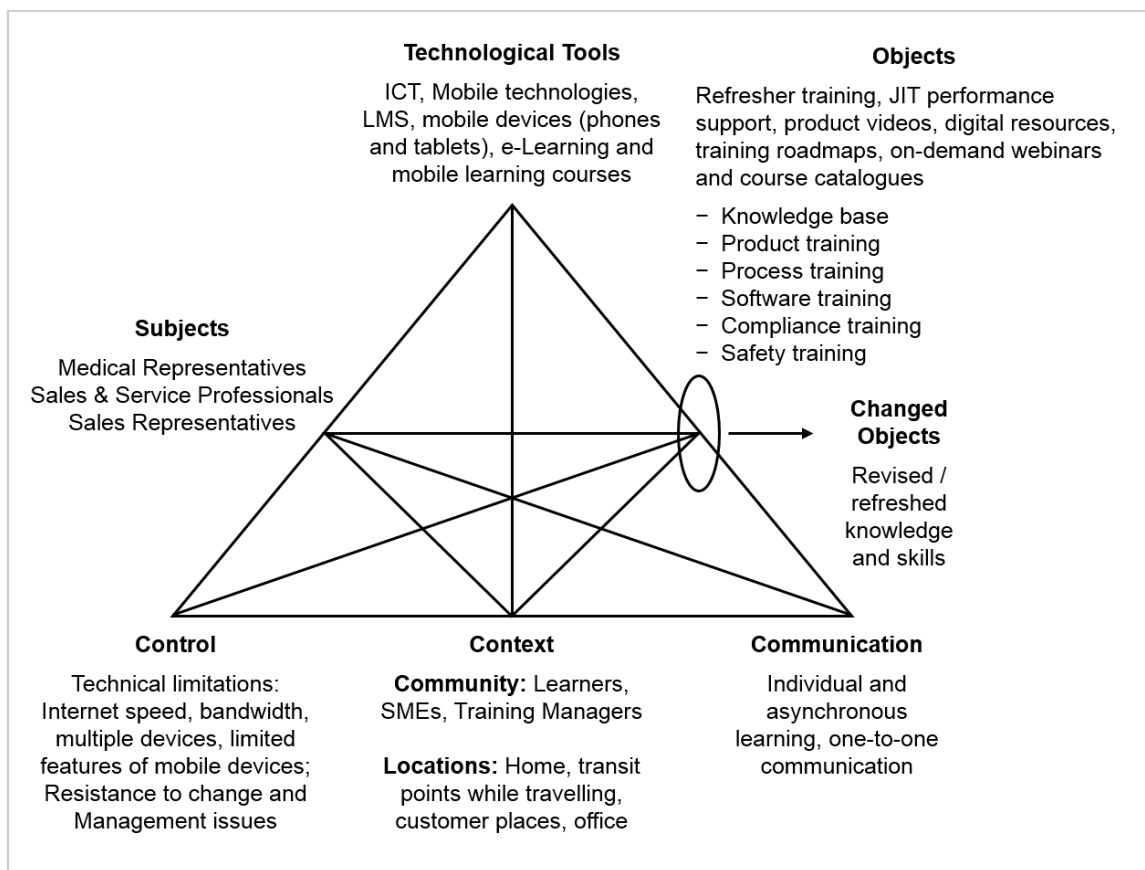


Figure 5.71 Mobile Learning Activity consolidated across all 3 organisations

Subjects: The subjects for all three organisations are sales personnel (fresh recruits and experienced ones), with PCI also including service technicians.

Objects: The objects are mobile learning used as refresher training. At ABT, the topics are the knowledge base (human anatomy and physiology), product training and process training. At PCI, objects take the form of performance support and digital resources for product, process, compliance, sales and marketing, and technical training, while at Sun Finance, it is product training on different insurance offerings, compliance, safety, and process training.

Changed Objects are the revised knowledge and skills of experienced sales professionals (and in PCI's case, service technicians as well), whose feedback goes into revising the objects. However, because there is no collaborative aspect to mobile learning in all three organisations, the objects stay unchanged in the absence of conversations that could lead to revisions.

Technological Tools: Technological tools for all three organisations are Internet and communication technologies, mobile technologies, the LMS, mobile devices, e-learning and mobile learning courses. Tablets are preferred over smartphones due to their larger screen size.

Controls: Controls for all three organisations include usability limitations, Internet speed, bandwidth limitations, difficulty in managing content on multiple devices, mobile device limitations, IT security issues, resistance to change, management issues, and financial constraints.

Context:

- **Locations** include the learners' homes, offices, and transit points.
- **Community:** In addition to sales personnel and training managers, the community also comprised SMEs. At PCI, the community included sales and service professionals of different customer segments (corporate and retail customers and resellers).

Communication: Communication was restricted to interactions between the objects and learners, with no collaboration among learners, or learners and SMEs.

5.6.7 Tensions in Mobile Learning Activity

Important tensions identified in the study are detailed below, with the reasons for them differing across organisations in some cases.

5.6.7.1 Incompatibility of the content/tools to mobile screens or devices

Respondents in all three organisations agreed that mobile learning was constrained by their usability issues or incompatibility of the content/tool to mobile screens or devices (with all of them agreeing on the tablet being the device of choice even though it doesn't fit in a pocket), low Internet speeds and bandwidth issues.

When it came to differences, some learners at ABT and Sun Finance felt constrained by LMS navigation issues.

However, the reasons for this perception could be more to do with lack of orientation to the LMS rather than the features of the LMS itself.

At ABT, the BYOD policy of the company also created a high degree of tension between the learners and the mobile learning activity. At PCI, low Internet speeds and bandwidth issues in emerging APAC markets caused difficulties in accessing learning when needed. However, mobile learning was considered suitable for regions such as India and Russia as it overcomes barriers of limited access to computers or Internet while on the move.

5.6.7.2 Suitability of mobile learning for refresher training and various training objectives

Findings showed slight variations in the use of mobile learning for achieving different training objectives. Although the sales and service staff in all organisations felt mobile learning was suitable for any topic, there were tensions within each organisation, with training managers in ABT opining that mobile learning should be restricted to small, relatively easy-to-assimilate “nuggets” and that lengthier topics were best reserved for e-learning and classroom training. So, mobile learning was confined to refresher training rather than for building substantial knowledge and skills. Training managers at PCI felt that mobile learning is used to pique learners’ interest for in-depth e-learning courses and for just-in-time learning (performance support and job aids). At Sun Finance, most topics were considered suitable for mobile learning, except behavioural training requiring physical interaction between

learners. Finally, all training managers across the three organisations felt soft skill training is best done in the classroom.

5.6.7.3 Resistance to change and management issues

In addition to technological limitations, learners were constrained by resistance to change and management issues. A major roadblock to the widespread implementation of mobile learning was felt to be lack of quantifiable benefits as perceived by management, affecting budget for its implementation and restricting its usage to larger regions. Budgetary constraints and lack of interest on the part of management to implement and promote mobile learning were cited as limitations in general.

5.6.7.4 Communication in mobile learning

There was concurrence among all three organisations that learners were predominately self-learning, communicating primarily with the objects and technological tools. Both the training managers and staff thought mobile learning is for individual asynchronous learning. They hadn't experienced collaborative communication and learning with other learners and with SMEs in real time, or even asynchronously. However, at PCI, there appeared to be informal exchange of information and ideas via mobile learning, while Sun Finance recognised the potential for collaborative learning as a future possibility.

5.6.8 Summary

Overall, I found a high degree of commonality in my findings across all the three organisations (perceptions of training managers and sales and service personnel) related to the parameters I focused on. The main differences among them were to do with variations, some quite minor, between the subjects (learners), training objectives, the topics mobile learning was considered best suited for (training managers differed in their opinions), technological tools and restrictions, and leadership support. I will go on to compare my findings to the existing literature in this area in *Chapter 6 (Discussion)*.

6 Discussion

6.1 Introduction

This section compares my findings from the case studies to the existing literature as detailed in *Chapter 5, Literature Review*, where I had covered three main areas of research – *E-learning in the Corporate Sector* – its advantages and disadvantages, its effectiveness and comparison with classroom training; *Mobile learning in the Corporate Sector* – an overview of mobile learning, its advantages and challenges in adoption at the workplace; *Influence of Context on Learning Technology Integration in Corporate Settings* – external factors that either enable or restrain the integration or adoption of learning technology in corporate settings.

However, my review of e-learning only aimed at providing information about the context in which mobile learning was adapted, so my focus in this section is on the latter two areas to do with mobile learning. I have divided each of the relevant themes into two parts – commonalities and differences – and have juxtaposed my findings with literature to compare the two. The following are the main constituent themes.

6.2 Findings and Existing Literature

6.2.1 What Is Mobile Learning and How Is It Related To E-learning in Organisations?

6.2.1.1 Commonalities with Existing Research

My findings of the cross-case analysis on the definition and understanding of mobile learning concur partly with the literature on the relationship between mobile learning and e-learning, with respondents in all organisations feeling it was a close one but not the same, that mobile learning was a part of e-learning but also NOT an entirely new way of learning. These findings agree with Mostakhdemin-Hosseini and Tuimala (2005) who opined that mobile learning is just an “immediate descendant” of e-learning. The differences between e-learning and mobile learning were seen in the location of learning, type of device used, and the kind of content presented.

When it came to location, my findings concur with the literature that unlike e-learning, learners are not restricted by location when accessing content via mobile devices, and hence it is independent of location in time or space (McManus, 2002). When it came to the type of device used, my findings also concur with Quinn (2011) and Pinkwart et al. (2003) who classified mobile learning as e-learning that uses mobile devices for delivery.

6.2.1.2 Differences with Existing Research

My findings don't concur with literature when it comes to mobile learning being viewed entirely different from e-learning, the collaborative aspect of e-learning, and its specific use for millennials.

On the question of whether mobile learning is an entirely different way of learning, the training managers felt e-learning and mobile learning are "*two sides of the same coin*" and "*should be used complementarily*". They viewed mobile learning as NOT entirely different to e-learning, but more as an extension of e-learning with similarities and differences. One of the managers called mobile learning a "miniaturised version" of e-learning, modified to work on a mobile device. However, these findings are contrary to Sharples' view (2005) that mobile learning is an entirely different way of learning with its own distinctive features. That said, respondents did feel that it does provide new options to access learning. One of the managers said mobile learning is more engaging and motivating and will have a larger role in the future.

Another difference with existing literature is on the collaborative aspect of mobile learning. Although respondents felt learners could potentially communicate differently with other learners and tutors in mobile learning as compared to e-learning, this is not true in reality. My findings also don't concur with literature that compared to e-learning, learners are more likely to engage in collaboration, communication, and peer-to-peer feedback on mobile devices (Pimmer & Pachler, 2013). This has been detailed under the previous

section, 5.6.5 *Dynamics of Mobile Learning Practice* under *Communication: Channels and Conversations*. Another area where my findings do not support literature are in its use for training millennials, who will constitute the majority of the world's workforce by 2030 (Schadler, 2013) and who are assumed to be more tech-savvy and more likely to prefer mobile learning over e-learning in their workplace (Heskett, 2007). However, my findings don't indicate anything about millennials being more likely to take to mobile learning as compared to others.

6.2.2 Advantages and Effectiveness of Mobile Learning

My findings on the key benefits of mobile learning sought by organisations mostly concur with literature covered under *section 2.3.4 Effectiveness of Mobile Learning*. A list of benefits of mobile learning (Heiphetz, 2011) below shows where it is backed by findings from the cross-case analysis and where it differs.

6.2.2.1 Commonalities with Existing Research

On the universal accessibility of content, the majority of respondents listed the main benefits of mobile learning as its ubiquity and "speed and reach", concurring with Hummel and Hlavacs (2003). The ability to adapt to disparate categories of workers was also supported by my findings across cases. This will be further discussed in the *section, 6.2.3 Suitability of Mobile Learning for All Kinds of Learners*. Coming to customised training addressing the needs of

the organisation, my findings seem to concur with this, as respondents in all organisations felt mobile learning is very effective in facilitating exchange of ideas, improving job performance, inculcating new skills, and improving business knowledge. This agrees with the literature that as mobile learning can be customised, it can be used to address the training needs of the company's short, medium, and long term goals in terms of ILT, e-learning and mobile learning (Heiphetz, 2011). Peng et al. (2009) stated that mobile learning makes it possible to learn the right thing, at the right time, and at the right place.

On the overall effectiveness of mobile learning (*section 2.3.4 Effectiveness of Mobile Learning*), respondents in all three organisations felt mobile learning overcomes the barriers of time, location, immediacy, and inability to devote longer time to learning. However, although findings show that mobile learning was effective, there were no empirical studies done at any of the organisations to evaluate its effectiveness in terms of actual learning that could be transferred to the job. This concurs with the study of Haag (2011), where effectiveness of mobile learning was measured at Kirkpatrick-Phillips' reaction and learning levels, but both could not be used conclusively to establish the effectiveness of mobile learning.

6.2.2.2 Differences with Existing Research

My cross-case analysis reveals some exceptions in terms of the kind of topics (objects) not suitable for mobile learning, discussed under the *section, 5.6.5 Dynamics of Mobile Learning Practice*.

On the collaborative aspects of mobile learning, my findings are contradictory to literature, as detailed under *6.2.8 The Role of Communication in Mobile Learning*.

On the effectiveness of mobile learning, my findings neither agree nor disagree with literature that there is better retention of knowledge with mobile learning as compared to classroom teaching (Fozdar & Kumar, 2007) because I didn't evaluate knowledge retention. However, the main benefit as *stated* across organisations was knowledge acquisition through mobile learning. This will be further discussed in the next topic.

6.2.3 Suitability of Mobile Learning for All Kinds of Learners

6.2.3.1 Commonalities with Existing Research

The cross-case findings show mobile learning is suitable for a variety of employees. Most respondents (subjects) felt mobile learning is not restricted to a particular type of learner but has a broader applicability. Learners in my case study included sales personnel, fresh recruits as well as senior and experienced people, with PCI also including service technicians. Their

backgrounds were diverse – from high school graduates to ones with graduate or masters’ degrees. Most of them were highly positive about the effectiveness of mobile learning. This finding agrees with literature that mobile learning has the ability to adapt to disparate categories of workers (Heiphetz, 2011). This is further supported by the finding that anyone could use mobile learning to learn, and that it works across all categories of learners irrespective of their experience, rank or age. However, this seems to disagree with earlier research on the barriers in adopting mobile learning, modifying mobile learning to match the expectations, attitudes, and satisfaction of users, especially those over 55 years of age (Song & Erdem, 2011), implying that mobile learning has to be customised to various groups. Nevertheless, later research that mobile learning is suitable for all learners attributes it to the increased comfort level of people in using mobile devices (Panigrahi et al., 2018).

6.2.3.2 Differences with Existing Research

While my findings generally concur with the later research, the suitability of mobile learning for all learners could become an area for study. This is because mobile learning was not customised to any particular age or level of education and was the same for all learners. However, my sample size was small and learning effectiveness was not measured. Therefore, my cross-case findings seem to warrant more future research in this area – the efficacy of mobile learning for two age segments, older people vs. millennials.

Consequently, while I had hoped the outcome of my cross-case analysis

would address the existing gap in literature (the influence of millennial workforce on the adoption of mobile learning), it seems to be an area requiring focussed research to arrive at conclusive evidence either way. Researchers will also need to think differently about the relevance of age on the kind of content that is likely to be deployed through mobile learning.

6.2.4 Suitability of Mobile Learning for Various Training Objectives

6.2.4.1 Commonalities with Existing Research

My findings indicate a consensus across case studies that mobile learning objects is ideal for performance support where learners use mobile learning when they need access to certain information on the job, concurring with literature which anticipated that in future, mobile learning would be 'Just-in-case' learning, essentially performance support (Pimmer & Grööhbiel, 2008). It was opined mobile learning generally builds on primary training in the classroom before salespeople go out into the field, which again indicates that the role of mobile learning was seen as performance support or a supplement to classroom training.

This ties in with literature that mobile learning will not replace e-learning (Biggs & Justice, 2011), that it cannot be taken as a panacea for all training ills nor should it be considered a replacement for e-learning and classroom training (Shudong & Higgins, 2005). It also supports literature that mobile learning in corporate organisations is used in conjunction with e-learning and

classroom training in a blended form – mainly to complete a larger e-learning delivered as micro-learning modules via mobile devices or as performance support nuggets as just-in-time learning (Traxler, 2007). The findings are in agreement with literature which listed suitability of content as one of the hurdles for mobile learning (Mungania, 2003). This is further backed by later literature [TIPEC framework Structuring Technological, Individual, Pedagogical Barriers and Enabling Conditions (Ali et al., 2018)] that lists course content as a barrier. All respondents in the three organisations agreed mobile learning is most effective for compliance, product, and process training, with the sales and service staff agreeing on sales and marketing training as well, while training managers did not.

6.2.4.2 Differences with Existing Research

The cross-case analysis also threw up differing opinions, with mobile learning considered the "best method to teach something new quickly", or useful where people don't have computers or Internet but might have access to a cell phone. This opens an intriguing area for future research – the efficacy of mobile learning in such geographies, as this was not evident in the research I reviewed. This is important because it exponentially increases the possible consumers for mobile learning, which again ties back to its wider reach. It was also felt mobile learning was not suitable for complicated topics requiring "serious and heavy" learning or for leadership or behavioural training. This also bears further investigation because with multiple formats of learning

(such as videos, podcasts) being used extensively in mobile learning today, these barriers may no longer exist.

My findings did not shed any light on changed objects in mobile learning (learner-generated content giving rise to changed objects) because as mentioned previously, the collaborative aspect of mobile learning had not been explored in the organisations I studied. A study on learner feedback leading to revised mobile learning would need to be undertaken in organisations that are in the mature phase of mobile learning adoption.

6.2.5 Role of Technological Tools in Enabling or Restraining Mobile Learning

For the purpose of this study, technology is the digital courseware delivered on mobile devices, LMS, and LCMS. It also includes computer technology, ICT, Internet, and mobile technologies.

6.2.5.1 Commonalities with Existing Research

My findings on mobile courseware concur with research that defines mobile learning as occurring when technology, learners, and learning are mobile (El-Hussein & Cronje, 2010).

6.2.5.2 Differences with Existing Research

My findings on the LMS and device did not concur with existing research that stated that technological barriers such as the quality of the LMS were one of the top barriers in e-learning adoption (Mungania, 2003). (This applies to mobile learning as well because it uses an LMS too.) Literature also shows mobile learning is not easy to track or follow-up (Shudong & Higgins, 2005), and as my own previous research has shown, most LMSs do not track learning delivered through mobile devices (Prasad, 2013). However, my cross-case findings don't support this entirely as all three organisations host their learning content on their LMS and for the majority, LMS issues did not pose a significant problem to mobile learning – disagreeing with the literature I reviewed.

According to my cross case-findings, the most appropriate mobile device for mobile learning was a tablet. This does not strictly agree with earlier descriptions of mobile learning using portable, lightweight, electronic, and wireless devices that are small enough to fit one's pocket, purse, or hand (Kukulska-Hulme & Traxler, 2005). That said, my findings talk more about usability limitations of mobile devices and the 'Bring Your Own Device (BYOD)' policy in organisations than on any actual limitation of the mobile device itself. More details are covered under *section 6.2.7 How Do Technological Restrictions and Social Factors Influence Mobile Learning?*

6.2.6 Who Participates in Mobile Learning and From Where Is It Most Accessed?

6.2.6.1 Commonalities with Existing Research

My findings on the context of mobile learning – communities and locations – concur with literature. They show the main community for mobile learning in these organisations comprises the staff (sales and technical service personnel). Other members of the learning community are subject matter experts who develop the course content and sometimes act as classroom trainers, and the training managers responsible for training marketing and sales staff. While the staff were positive towards mobile learning, training managers had reservations on certain types of learning that may influence the adoption and assimilation of mobile learning. SMEs who taught in the classroom could be a possible barrier, leading one to conclude that mobile learning will not replace e-learning just as e-learning did not replace traditional classroom training (Biggs & Justice, 2011). Although research indicates that “mobile learning is being embraced because mobile computing is being embraced” (Burger, 2006), my findings show that there are contradictions in the perceptions of training managers – that while sales personnel would benefit greatly from mobile learning, soft skills such as selling skills are not suitable for mobile learning. ‘Defender’ type SMEs and managers less open to such initiatives (Raymond et al., 2012) could be a significant barrier to mobile learning adoption.

With respect to locations, all respondents felt mobile learning could be accessed from any location. It was also found that what mattered in mobile learning wasn't the location, but the content type and the need of the learner. This agrees with literature listing ubiquitous learning in space and time as one of the critical success factors (Alrasheedi & Capretz, 2018). Analysis shows most subjects travel extensively and mobile learning takes place primarily in the home (or hotel), followed by the office, and other transit locations; this is backed by Vavoula's MOBIlearn's (2005) findings. I found no differences with existing research on the topic of who participates in mobile learning and from where it is most accessed.

6.2.7 How Do Technological Restrictions and Social Factors Influence Mobile Learning?

6.2.7.1 Commonalities with Existing Research

The cross-case findings on technological restrictions and human factors concur with earlier literature as most participants felt technological barriers in the form of usability limitation of mobile devices (screen size, incompatibility with Adobe Flash), along with limited bandwidth, IT security issues, and psychological resistance of stakeholders are barriers for mobile learning. Learners using multiple devices was also cited as a barrier. These findings on usability limitations of mobile devices partly support my own previous research that technically, the small screen size, difficulty in inputting data, and limited memory, along with inability of mobile devices to run Adobe Flash are hurdles in the adoption of mobile learning (Prasad, 2013). These findings on

technological barriers also support the findings of Raymond et al. (2012) that technological factors are one of the three categories of factors that impact the adoption and assimilation of mobile learning and that of Eklund et al. (2003) in which technology innovation figures among the three main drivers of e-learning.

My findings support existing literature on human factors, showing psychological resistance by stakeholders (lack of leadership support, resistance to change) as a barrier. Leadership support was perceived as important. There was also resistance to change from the SMEs, both in terms of time taken and learner friendliness of content. This is supported by literature which lists personal or dispositional factors (Mungania, 2003) or human factors (Medarova et al., 2012) as restraining factors. According to Raymond et al. (2012), factors impacting the adoption and assimilation of mobile learning include organisational factors (top-management support, organisational culture), and environmental factors (external pressures).

6.2.7.2 Differences with Existing Research

Later research on technological restrictions reveals that most of the earlier challenges for mobile learning (e.g. technological limitations) have reduced, at least to some extent. In recent years, modern authoring tools with responsive design have overcome the limitations of usability of devices (screen size, courses rendering correctly) along with advances in mobile and learning technologies and the increased comfort levels of people using mobile devices

(Panigrahi et al., 2018). However, my findings show that these issues still remain.

6.2.8 The Role of Communication in Mobile Learning

6.2.8.1 Differences with Existing Research

With communication being the dialectic relationship between and among all the actors in the system and between the semiotic and technology layers, one would expect mobile learning to have a lot of interactions of learners with the learning and technology, and among the learners themselves. My cross-case analysis shows a marked departure from literature that conversation is the ‘currency’ of learning (Pask, 1975), and mobile learning is "the process of coming to know through conversations across multiple contexts amongst people and personal interactive technologies" (Sharples et al., 2007, p. 225), and occurring during person-to-person mobile communication (Nyíri, 2002).

To reiterate some of the literature, mobile learning according to Suki and Suki (2007) enables individuals to “have more social participation, maintain extensive interpersonal networks, and have contact with people not only within the social system but also outside it”, and according to Hummel and Hlavacs (2003) is that in which people “can access, communicate and share content from anywhere and anytime, both synchronously as well as asynchronously.”

Again, although the findings of a survey on whether and how mobile devices can support the learning of workforce (Pimmer & Grööhbiel, 2008) showed that social interaction and reflection on learning processes received the most positive evaluation, the cross-case analysis reveals mobile learning as suitable only for individual, asynchronous learning. Collaboration and reflection among learners and/or SMEs have not been observed.

In fact, this is probably one of the reasons why participants felt mobile learning was very closely related to e-learning – one of the drawbacks associated with e-learning being lack of interaction among learners as most e-learning is self-paced/asynchronous (Welsh et al., 2003). Participants seem to have extrapolated this drawback to mobile learning as well.

However, participants in all three organisations felt mobile learning facilitates the exchange of ideas. This contradicts their own view of mobile learning being self-paced, individual, and asynchronous. The reason for this inconsistency could be a lack of awareness about the potential of mobile learning than any limitations they discovered personally in their experience. This area bears further research because social interaction and reflection on learning processes in turn also has implications of how mobile learning is revised (changed objects) and that of the barriers to mobile learning adoption could be the lack of collaboration demonstrated by my research.

6.3 Summary

Overall, I found a high degree of commonality in my findings across all the three organisations (perceptions of training managers and sales and service personnel) related to the parameters I focused on. The main differences among them were to do with minor variations in the subjects (learners), training objectives, the topics mobile learning was considered best suited for (training managers differed in their opinions), technological tools and restrictions, and leadership support.

However, my cross-case findings differed from literature – on mobile learning being different from e-learning, the collaborative aspect of mobile learning, millennials being more likely to adopt mobile learning, training objectives and topics mobile learning was considered best suited for (training managers differed in their opinions), technological tools and restrictions (LMS issues, perception of ideal mobile device, prevalence of internet and IT issues) and finally, communication in mobile learning (conversations being absent in practice).

7 Conclusion

7.1 Overview

This chapter begins with reiterating my research objectives, goes on to provide a summary of my main findings, and discusses how the study answers my research questions. It then outlines the limitations of the study and goes on to briefly summarise my contributions to research knowledge and to practical knowledge for the corporate sector. I conclude my thesis by discussing possible implications for future research.

My main research question was, “How do training managers and sales and service staff experience the adoption of mobile learning in corporate training settings where e-learning is already firmly established?” This is answered in *sections 5.6.4 Key Objectives Being Sought in the Organisation*, and *5.6.5 Dynamics of Mobile Learning Practice*. One of my sub-questions – “How do training managers and sales and service staff perceive the relationship between mobile learning and wider e-learning practices?” is answered in *section 5.6.2 Relationship to Established E-Learning Provision*.

The research comprises three case studies on the experience of training managers and sales and service staff in three corporate organisations using e-learning to train their staff and in the initial stages of adopting mobile learning. My main purpose in undertaking this research was to find out how corporate training managers and sales and service staff view mobile learning, especially relative to more established forms of e-learning; to ascertain

whether they think it is, or might become, effective for their own purposes and the reasons for their evaluation; and to understand and map out the elements of practice of mobile learning in their organisations. This gave me interesting insights about how different organisations seem to work differently despite adopting similar technologies.

There are three main themes or core messages that come through the findings of my research. The first is how respondents tended to unanimously view mobile learning through the lens of e-learning by perceiving the two to be closely related: not the same, and yet not something entirely new. The second core message is related to Sharples' components across the 3 case studies – although there was a high degree of agreement among them (and with existing literature), there were interesting variations with significant implications; especially when it came to the views of training managers. A significant finding was that, contrary to common perceptions, it was not technology or content that played a restraining role in the deployment of mobile learning, but other things such as social rules. The second and very interesting finding is that although all the three organisations seemed to be aware of everything that mobile learning can do, in actual practice, they seem to be using it only as dictated by their specific business needs. Another noteworthy finding is that, in these settings, communication seems exclusively restricted to interactions between subjects (learners) and objects (courses), with no collaboration among learners or between learners and SMEs – thus indicating that respondents' perceptions of mobile learning didn't take into account one of its most defining characteristics as stated in literature –

collaboration. It is possible that while respondents perceive that mobile learning could in principle include collaboration, they don't do it or haven't experienced it in practice.

7.2 Overview of Research Findings

In this section, I have summed up my research findings by contextualizing them in the literature reviewed.

7.2.1 Organisational Context

Though corporate training has been evolving rapidly, traditional instructor-led classroom training continues to be the most popular form of training delivery, accounting for more than 57% of the annual training budgets of organisations in North America, with mobile learning accounting for only 2.13% of the total training hours as per the 2018 State of Industry Report by ATD (ATD, 2018). These findings agree with my own observations, and I wanted to find out why the adoption rates were so low.

My study was situated in organisations which were using e-learning but where mobile learning is in the early stages of adoption. To minimise any industry/sector bias influencing the research findings, the three organisations were selected from different industry segments (healthcare, personal computer manufacturing, and banking, wealth management and insurance

solutions). Similarly, for a global perspective, the organisations were selected from different geographic locations (North America, Australia, and Asia).

7.2.1.1 How Mobile Learning Relates to Existing E-Learning Provision

I found that the relationship between established e-learning and mobile learning was viewed as being a close one but not the same by both staff (learners) and training managers. Most respondents felt mobile learning is a part of larger e-learning, despite a few differences in terms of types of devices used, content delivered, and location of learning. However, on their overall perceptions about whether mobile learning was entirely different to e-learning, a small fraction of them felt the two were entirely different, though most saw it as an extension of e-learning and not a completely new way of learning. Scholarly literature often positions mobile learning as a new paradigm, yet in the contexts I studied, that was not how it was perceived. This is supported by literature stating that mobile learning is just an 'immediate descendant' of e-learning (Mostakhdemin-Hosseini & Tuimala, 2005), and contradicts later literature that mobile technologies were showing new paradigms of teaching and learning (Kukulska-Hulme et al., 2009).

My findings on mobile learning being different from e-learning despite the close relationship could perhaps be attributed to the fact that mobile learning initiatives were built on existing e-learning infrastructure. In other words, the history of using e-learning in the organisation was shaping how mobile learning was perceived and used.

E-learning and mobile learning were viewed by one organisation to be more closely related than classroom training and e-learning; with technology being the binding factor between e-learning and mobile learning. However, for another organisation, the main differences between the two were that mobile learning allows learners to communicate with other learners and tutors differently than e-learning (although they didn't do it in practice). For the third organisation, the biggest difference was that it allows the use of a greater range of technologies to access content. All organisations agreed that mobile learning allows them to learn in more locations than e-learning, which concurs with literature about it being independent of location in time or space (El-Hussein & Cronje, 2010; McManus, 2002).

I can conclude that respondents in my study didn't perceive a paradigm shift from a traditional classroom or self-paced e-learning to the less formal, more open, more truncated, but more collaborative mobile learning. However, that still doesn't say anything about whether we are witnessing or going to witness a new and revolutionary way of how people learn at work in the near future because of other factors, stated in the *limitations section*.

7.2.1.2 How Mobile Learning is Understood in the Organisations

My findings on what constitutes mobile learning show that most respondents viewed the key aspects of mobile learning to be the mobility of the learner (not connected to a physical training environment) and learning that happens using any mobile device (mobile phone, tablet – although most felt the most

appropriate mobile device for mobile learning was the tablet). This concurs with literature that supports both mobility of learner and device (O'Malley et al., 2005), and with literature classifying mobile learning as e-learning using mobile devices for delivery (Brown & Mbatia, 2015; Pinkwart et al., 2003). One training manager even included a laptop in mobile devices, so it appears the size of the device was not important as long as it could be used by learners while they are on the move, even though literature defines a mobile device being predominantly handheld or palmtop devices (Traxler, 2005). Most also thought mobile learning had to do with both the mobility of the learner and the device. This disagrees with literature that the mobility of the learner is more important than the device itself (Sharples et al., 2005). However, it agrees with later literature describing mobile learning as learning where technology, learners, and learning are all mobile (El-Hussein & Cronje, 2010).

The training managers had different perspectives – one terming it “online learning”, which is contrary to Sharples’ view that mobile learning is an entirely different way of learning (Sharples, 2005), the another seeing it as totally different from e-learning, with it perceived as bringing an element of excitement and openness to learning.

Mobile learning was also seen as being of short duration of ten minutes or less, which is supported by literature referring to it as being bite-sized and lightweight (Traxler, 2005). However, one training manager differed in his opinion and said it could even be one hour or two.

7.2.1.3 Key Objectives for Mobile Learning Adoption

On the organisations' perceptions on the key objectives for mobile learning adoption, my findings show that all of them mentioned multiple objectives, which tie back to the benefits of mobile learning mentioned in *Chapter 1*.

One of the objectives for its adoption is its ubiquity [concurring with literature emphasizing its ubiquity (Hummel & Hlavacs, 2003)], and its ability to reach a large number of people. Other key objectives for using mobile learning were its cost effectiveness and its ability to deal with varied content, although one of the training managers considered mobile learning not suitable for "heavy" learning", and most training managers feeling it was not suited for soft skills training.

Yet another objective for deploying mobile learning was the ease and effectiveness of learning. However, the reasons for it being considered effective differed from organisation to organisation, with it being viewed as the "best method to teach something new quickly", and more than a job aid by one organisation, while another saw it as both learning and also a kind of job aid (convenient and with immediate application). The third organisation saw it as effective because it had no extraneous information. As far as the effectiveness of mobile learning is concerned, my findings neither support nor disagree with literature that there was better retention of knowledge with mobile learning compared to classroom teaching (Fozdar & Kumar, 2007) because I didn't evaluate knowledge retention.

My findings show that all respondents felt it met many training objectives – facilitating exchange of ideas, improving job performance, and inculcating new skills, even though they didn't really seem to understand how mobile learning could be collaborative. This is covered in the *section 5.6.4 Key Objectives Being Sought in the organisation*.

Finally, all three organisations seemed to have convenience as an objective, perceiving that mobile learning overcomes the barriers of time, location, immediacy, and inability to devote longer time to learning.

7.2.2 Dynamics of Mobile Learning Practice

In this section, I sum up my findings on the dynamics of mobile learning practice from the perspective of Sharples' framework of mobile learning. In *Chapter 1*, I had stated that I wanted to investigate how these issues played out in several organisations – I have done this by consolidating all the components so that readers can see how the different local circumstances could have possibly influenced the practices of mobile learning in those organisations. By providing insights into barriers and identifying current bottlenecks and elaborating on actual mobile learning issues in the real-world corporate setting, it could help us chart the way forward.

I will deal with the various dynamics in the order in which they are given in the Sharples' framework, except where I have consolidated similar ones for convenience.

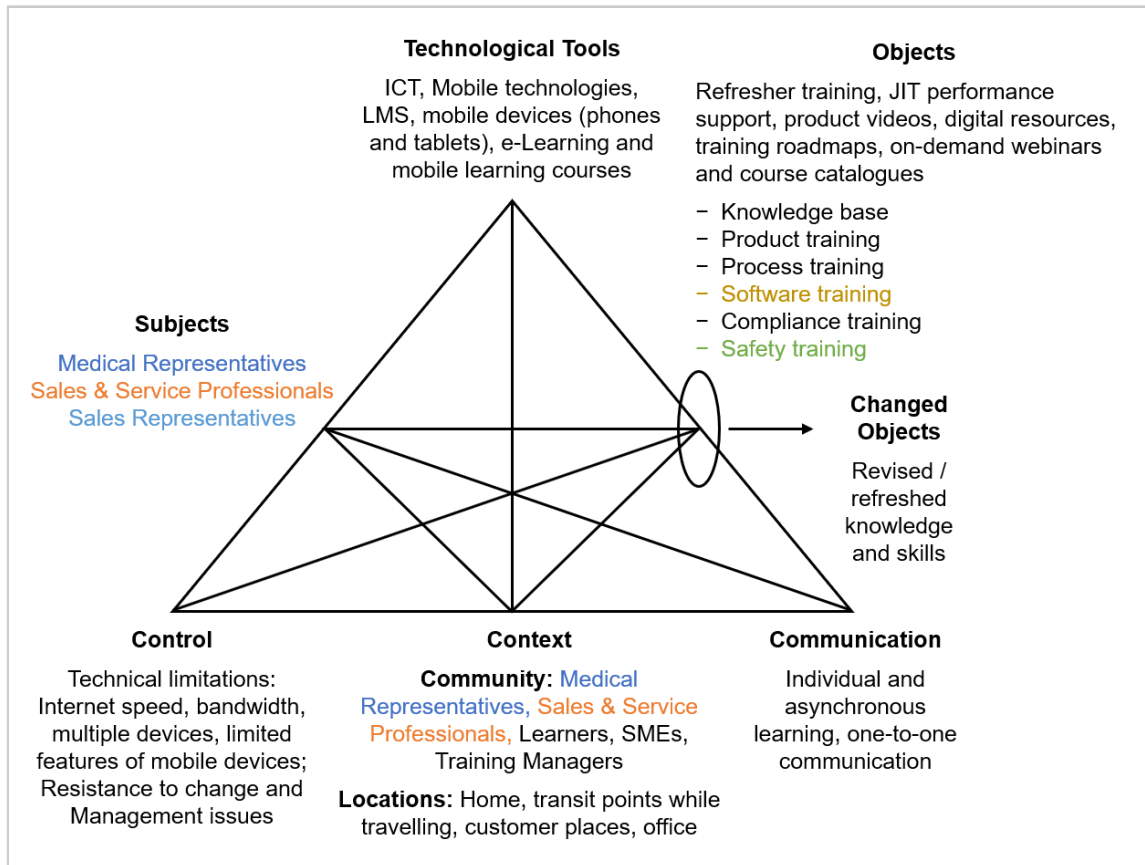


Figure 7.1 Mobile Learning Activity consolidated across all three organisations
* the coloured text in the diagram above depicts the differences among case studies

7.2.2.1 Mobile learning being suitable for all kinds of learners (subjects)

My findings show that learners in all three organisations (sales personnel, with one of the organisations also including service technicians) were positive about mobile learning, despite their varied backgrounds – medical representatives and their senior colleagues, sales personnel selling high-end computers and servers directly to corporate customers and those selling at retail chains, and sales professionals selling financial products to individuals and organisations. Their backgrounds included engineering and computer sciences, high school degrees (for retail salespeople) and undergraduate degrees in commerce, arts, or management.

Except for those selling at retail chains, staff respondents' jobs involved travel with plenty of waiting time in transit. This made their learning environment a variable factor, with locations ranging from home to waiting rooms, and customer sites. Most subjects at all three organisations felt mobile learning was suitable for all kinds of learners, not favouring any one type. This is backed by literature, which states mobile learning has the ability to adapt to disparate categories of workers (Heiphetz, 2011). This once again ties back to the advantages of mobile learning being suitable for any type of learner – regardless of their academic background or mobility.

One area my research didn't add to was in addressing the existing gap in the literature thus far on the influence of millennial workforce on the adoption of mobile learning. My findings show that millennials in the workforce were using mobile learning broadly the same as everyone else. It is also worth mentioning that one of the learner groups who were millennials, took the mobile learning at a fixed location (at the retail stores), and not while on the move. This also brings me back to one of the points I wanted to clarify, whether organisations perceived mobile learning to do with the mobility of the learner, the device, or both. Not surprisingly, the retail salespeople saw mobile learning as being learning through any mobile device. I don't think the learner's mobility was specifically recognised by the organisations, which contradicts literature mentioned in *section 7.2.1.2 How Mobile Learning is Understood in the Organisation*.

7.2.2.2 Mobile learning being suitable for various training objectives (objects)

One of my questions about the suitability of mobile learning was whether participants feel mobile learning could help them learn something substantial and useful. When it came to the kind of training needs mobile learning was best seen as addressing, my findings show that it was generally considered ideal for “refresher training”, performance support, and as job aids rather than for traditional learning, although one of the organisations did indicate it was also suitable for traditional learning. This concurs with literature that in future, mobile learning would be ‘just-in-case’ learning, essentially performance support (Pimmer & Grööhbiel, 2008). An interesting variation was that in one of the organisations, mobile learning is used to build on primary training in the classroom before salespeople go out to sell, using mobile learning as performance support as well. This ties in with the literature that mobile learning will not replace e-learning (Biggs & Justice, 2011), nor should it be considered as such (Shudong & Higgins, 2005), and is used in a blended form (Traxler, 2007). Details are in *section 6.2.4 Suitability of Mobile Learning for Various Training Objectives*.

On the suitability of mobile learning for specific topics, a majority of staff and training managers felt that although mobile learning was suitable for teaching any topic, it was most effective for compliance, product, and process training. Most staff respondents felt it was suitable even for sales and marketing training, yet most training managers did not agree. Other areas for mobile

included “safety and quality training”. In general, however, the perceptions of the training managers did not match that of staff. They felt mobile learning was suitable for any topic requiring immediate access to knowledge, for piquing learner’s interest, and for learning that could be easily absorbed and immediately applied to resolve work related issues. They considered it unsuitable for difficult topics requiring “serious and heavy” learning and for first time learning which needed to be done in the classroom or through e-learning, and for leadership or behavioural training. An interesting finding was one training manager associating geography with the suitability of mobile learning. He felt it was useful where people do not have computers or Internet but might have access to a cell phone (for example, emerging markets). This could be an area for future research. Details are in *section 6.2.4.2 Differences with Existing Research*.

7.2.2.3 How technological tools and technological restrictions enable or restrict mobile learning

Here, I discuss technological tools from the Sharples’ framework and the controls exerted by technological restrictions. Technological tools for both e-learning and mobile learning in all organisations are generic Internet and communication technologies, mobile technologies, LMSs, mobile devices (phones and tablets), e-learning and mobile learning courses. In the section on *Organisational Setting*, I had mentioned how e-learning was the second most preferred method of training delivery. Even though the technology for mobile learning seems mainly similar to that for e-learning, when it comes to

the tools (except for mobile devices), the adoption rates for the two are drastically different. LMS issues were only a minor part (except for the staff of one organisation), so it does appear that these technological tools were not a barrier to adoption of mobile learning. This disagrees with literature that LMS is one of the top barriers for e-learning (Mungania, 2003), and hence for mobile learning, given that an LMS is used for both. See *section 6.2.5 Role of Technological Tools in Enabling or Restraining Mobile Learning* for details.

My findings were not really a surprise to me as a practitioner, because based on my experience in working with my clients, I knew that technology tools were in place to support mobile learning because they were already supporting e-learning, which uses the same technology (except for mobile devices). Technological restrictions however seemed to play a part – Internet bandwidth issues were the top concerns for both types of participants in all three organisations, while IT security issues were felt to be an issue by staff (but not training managers) across all three organisations. When it came to mobile devices, the most appropriate mobile device for mobile learning was perceived to be the tablet, disagreeing with literature (Kukulska-Hulme & Traxler, 2005). Staff at all three organisations listed usage limitations of mobile devices in terms of their screen sizes and incompatibility with Adobe Flash (limitations that are likely to arise when using multiple devices and not a standard mobile device ideally suited for mobile learning) – concurring with my own previous research (Prasad, 2013) – along with the limited and expensive bandwidth as the main control factors impacting the mobile learning community. This is a little surprising because as I mentioned in

Chapter 1, the advent of mobile technologies and wireless devices has opened more options for corporate training professionals and learners in addition to existing technology enhanced methods.

7.2.2.4 Social factors influencing mobile learning adoption

In *Chapter 1*, I had stated that mobile learning is yet to see significant adoption in corporate organisations and in my research, I explored the role of social factors for this – which includes both the context of the mobile learning community and the controls exerted by stakeholders. I will be dealing with communication factors separately. My findings uncovered who influenced its adoption, both within and outside the mobile learning community. While the learners (staff) made up the majority of the mobile learning community, it also included SMEs, who develop the course content and sometimes act as classroom trainers, and training managers responsible for the training. It goes without saying that if even one of these groups is resistant to mobile learning, it can impact its adoption. My findings revealed that while the learners were very positive towards mobile learning, training managers had reservations on certain types of learning (with one of them highly sceptical about its suitability for any type of learning) as I have mentioned in *section 6.2.4 Suitability of Mobile Learning for Various Training Objectives*. This makes me conclude that the community itself could be a potential barrier when there are ‘defender’ type managers, who may not welcome such initiatives (Raymond et al., 2012).

On other social factors of influence, my findings showed respondents in all three organisations felt leadership support was important for the success of mobile learning, as senior management's restrictions on budgets for mobile learning was an issue. Some also felt that despite leadership being more positively inclined than previously, they were not convinced on its return on investment. One of the training managers (not very supportive of online learning) felt the leadership had NOT made concerted efforts towards adopting mobile learning and that senior stakeholder willingness to invest was needed. Another training manager believed there was tacit support for mobile learning and that people tend to think mobile learning was a good idea. However, the majority opinion was that resistance of stakeholders was a barrier to mobile learning, which according to training managers at one organisation, could show in the time taken by the SMEs to get the course content ready. For details, see *6.2.6 Who Participates in Mobile Learning and From Where Is It Most Accessed?*

7.2.2.5 From where is mobile learning most accessed?

On the locations from where learners accessed mobile learning, my findings reveal a general consensus that mobile learning could be successful in any location because what was important wasn't the location, but the content type and the need of the learner. As mentioned previously, my findings revealed that most subjects travel extensively with substantial waiting time in transit, and the locations where mobile learning takes place are primarily the home (or hotel), followed by the office and other locations (airports, bus stations,

reception rooms of customers, customer offices, and places of recreation). This is backed by literature (Vavoula, 2005), that most of the learning took place outside the learner's "usual" environment. Other literature states that people creatively use their surroundings to make them "sites of learning" (Sharples et al., 2007). In general, as long as mobile learning content could be accessed, the physical location was viewed as irrelevant by all respondents.

7.2.2.6 The role of communication in mobile learning

One of the aspects that could possibly impact the adoption of mobile learning was that respondents in all three organisations viewed mobile learning as suitable for individual, asynchronous learning, restricting interactions to that between learners and courses, with no collaboration. Some training managers were unable to visualise a collaborative aspect to mobile learning but were open to the idea of a collaborative platform, even though one felt that "initially, it might be too much of a jump for people to go to that level". All of which completely disagrees with literature (Hummel & Hlavacs, 2003; Sharples et al., 2007, p. 225; Suki & Suki, 2007), which emphasised communication (conversations and collaboration) as an integral part of mobile learning.

7.2.2.7 Key Commonalities Between Organisations

Most of the organisations seemed to concur on most of the aspects I studied. The *'relationship with established e-learning'* was seen as close, yet different, mobile learning not being viewed as a new paradigm. This has implications for research because it appears mobile learning was being viewed through the lens of e-learning. See *section 5.6.2 Relationship to Established E-Learning Provision* for details.

On *'what constitutes mobile learning'*, all respondents agreed mobile learning happens when the learner is mobile, using any mobile device, or both. However, they agreed a tablet was the most preferred device because of its bigger screen size.

There was a great degree of overlap on *'key objectives'*, with organisations having multiple objectives, including reach, cost-effectiveness, immediacy, ease, and effectiveness of learning,

'Learners' were the same across all organisations – sales personnel – although one of them included service personnel as well. Their jobs involved extensive travel, except for sales personnel at the retail chains. They all agreed mobile learning didn't favour any particular type of learner.

On *'training objectives/topics best suited'*, most agreed mobile learning was best suited for refresher training and performance support, although respondents at one of the organisations felt it could be used for both. On topics ideal for mobile learning, all staff agreed it could be used to teach any topic. However, the training managers disagreed, stating certain topics, such as behavioral skills and complicated topics were not suitable for mobile learning. All concurred that it was best for product, compliance, process, and sales and marketing training (although training managers felt it was not ideal for selling skills).

Regarding *'technological tools and technological restrictions'*, most of the respondents agreed there were no major barriers in terms of technological tools, but usability of devices and use of multiple devices was an issue for all. Only one of the organisations had a BYOD policy in place. Tablets were considered the most appropriate even though they were not small enough to fit one's pocket, purse, or hand. Internet bandwidth and IT security issues were among top concerns for all organisations.

Where *'communities' are concerned*, all agreed that the main community was sales and service personnel, as well as training managers and SMEs.

There was also agreement that mobile learning could be successful in any *'location'*.

On *'leadership support and resistance to change'*, respondents in all three organisations recognised the importance of leadership support, with the majority feeling the resistance of stakeholders was an issue.

'Communication' was restricted to interactions between learners and the courses, with no collaboration among learners or between learners and SMEs. Although all staff respondents mentioned exchange of ideas through mobile learning, no data or examples were shared to corroborate this.

7.2.2.8 Key Differences among Organisations

I did not find any differences across the organisations (especially when it came to the perceptions of mobile learning), except for a few minor ones listed below:

Learners – In one of the organisations, learners included service technicians also. Though the job function of sales personnel was more or less the same, their backgrounds ranged from high school degrees to engineering and medical degrees.

Training objectives/topics best suited – respondents at one of the organisations felt the main objective of mobile learning was to deal with varied content. Opinions among managers across the three organisations about its suitability included the following – that mobile learning was suitable for any topic requiring immediate access to knowledge; it was ideal for piquing

learner's interest; it was best suited for learning that could be easily absorbed and immediately applied to resolve work related issues. Their opinions on what was considered unsuitable for mobile learning ranged from complicated topics and first time learning which needed to be done in the classroom or through e-learning, topics that had to be studied in detail, and leadership or behavioural training. Training managers in all the organisations felt mobile learning was not suitable for soft skills.

Location – at one of the organisations, the location was fixed, at the retail stores.

Technological tools and technological restrictions – LMS issues were viewed as a concern by most staff in one of the organisations. Internet issues were especially a concern in emerging APAC markets.

Leadership support and resistance to change – one of the training managers who was very enthusiastic seemed to think there was tacit support for mobile learning and there was no resistance to change.

7.2.2.9 Key Tensions

Important tensions identified in the study are detailed below, with the reasons for these tensions being different across organisations in some cases.

7.2.2.10 Incompatibility of the content/tools to mobile screens or devices

On learners being constrained by technological tools, respondents in all organisations cited usability issues (features of mobile devices or incompatibility of the content/tool to mobile screens or devices), low Internet speeds and bandwidth issues, with one of them listing difficulty of navigation on the LMS causing issues of access for the learners and another citing inability to track mobile learning in LMS as a limitation. However, the reasons could be more to do with lack of orientation to the LMS rather than its features. The BYOD policy of one of the organisations also created a high degree of tension between the learners and the mobile learning activity. Had the organisations issued standard mobile devices, all device issues and possible biases related to devices would probably have been reduced, though doing so might introduce new tensions.

7.2.2.11 Suitability of mobile learning for refresher training and various training objectives

On mobile learning being used to achieve training objectives, although most of respondents in all organisations felt mobile learning was suitable for any topic, there were tensions within each organisation, with one feeling mobile learning objects should be restricted to small, relatively easy to assimilate “nuggets”, reserving lengthier topics for e-learning and classroom training. So, mobile learning was largely confined to refresher training rather than building new and substantial knowledge and skills. One training manager felt mobile learning objects should be used to pique learners’ interest for in-depth e-

learning courses and for just-in-time learning (performance support). Another considered behavioural training requiring physical interaction between learners unsuitable for mobile learning. Clearly, the different training objectives were driven by each organisation's business realities, so respondents perceiving the suitability of mobile learning mainly for refresher training could be influenced by this. However, nothing can be conclusively said about this and this area requires further research.

7.2.2.12 Resistance to change and management issues

In addition to the technological limitations, learners were also constrained by resistance to change and management issues. A major roadblock to widespread implementation of mobile learning was perceived to be lack of quantifiable benefits as perceived by management, affecting budget for its implementation and restricting its usage. Budgetary constraints and lack of interest on the part of management to implement and promote mobile learning were cited as limitations. This could be an area for further research – the effectiveness of mobile learning as measured by knowledge retention to demonstrate its efficacy, and thereby lower resistance of stakeholders.

7.2.2.13 Communication in mobile learning

On communication in mobile learning, learners in all three organisations were predominately self-learning, communicating primarily with the objects and technological tools. Both the training managers and staff thought mobile

learning is for individual, asynchronous learning. They had not experienced collaborative communication with other learners and SMEs in real time or even asynchronously. However, in one organisation, there appears to be informal exchange of information and ideas via mobile learning, while another recognised the potential for collaborative learning as a future possibility. This could be a huge area for research given that communication (channels, conversations) form an integral part of mobile learning. See *section 6.2.8 The Role of Communication in Mobile Learning*.

7.2.3 Limitations

The limitations of my study are to do with my role, the scope of my study, and the questions I had hoped to have answers for but were left unanswered.

7.2.3.1 My own role

I gathered the data for this study in my capacity as a PhD student undertaking academic research. Yet, as explained in *Chapter 1*, I am also an established e-learning service provider and this could perhaps have unconsciously influenced the responses given by the training managers whom I interviewed because it is this group that my sales, project management, and learning design teams interact with when we work on their projects. It is possible that they felt obliged to sound more positive about mobile learning than they actually were. That said, it is equally likely that my relationship with the managers allowed me to gain better responses from them in some ways

because of our mutual recognition as long-experienced professionals. When it comes to the sales and service staff, on the other hand, it is highly unlikely that my role would have influenced the questionnaire data gathered from them because none of them had interacted with my teams, and moreover, they knew it was an anonymous and external survey, so there would have been no reason for them to hold back their candid feedback. Finally, the training managers and the staff concurred with each other's opinions, even though they were surveyed independently, with no scope for discussion amongst themselves.

Yilmaz states that a useful criteria for qualitative studies in 'trustworthiness', where study findings can be considered trustworthy if they are "accurate or true not only from the standpoint of the researcher but also from that of the participants and the readers of the study" (Cresswell & Miller as cited by Yilmaz, 2013, p. 319). The fact that the participants within each corporate broadly agreed with each other, and the fact that my professional expertise (and use of a particular theoretical framework) allowed me to contextualise their different perceptions into a coherent whole suggests, in my view, that my findings should be regarded as acceptably trustworthy.

When it comes to the readers of the study, Yilmaz also suggests a range of steps that researchers can take to maximise trustworthiness, which I have adhered to as closely as possible. My research questions are clearly defined, and the features of the study design are congruent with them. The basic paradigms and analytic constructs have also been clearly specified. My role

and status within the study context have been explicitly described. Data is thoroughly connected across the full range of appropriate settings, times, and respondents suggested by the research questions. Data was also double-checked both in graphs and in tabular formats during my analysis, although for the most part I have retained only graphs for conciseness. My findings also show meaningful parallelism across data sources (participants, contexts, and times).

All of the reasons listed above together contribute to my perception that the study is trustworthy. Yet there are also limitations when a single researcher is conducting the case studies with limited resources. Having to plan, organise, record, transcribe, and analyse each might have possibly limited my capacity to do justice to each interaction within the process. Occasionally my ability to generate deep understanding about particular issues using my instruments was restricted and I have been honest about that in the text when discussing those issues.

7.2.3.2 Choice of respondents

My study was limited to sales personnel, with service personnel also in one organisation, because of the difficulty in gaining access to other groups. This narrows the demographic significantly because it does not reflect the general opinion of different departments that make up an organisation. Although I had strong reasons for selecting sales personnel because of the mobile nature of their jobs, all perceptions captured in this study are only from the lens of sales

and service personnel. Again, although I wanted to study whether organisations were impacted in their adoption of mobile learning by a significant part of their workforce being millennials, my study had not really delved into the use of mobile learning with employees in departments other than sales.

7.2.3.3 Selection of organisations

I had strong reasons for selecting organisations in the early stages of mobile adoption because I thought it would give me insights into why mobile learning had still not gained traction. However, one of the limitations of this is that respondents' perceptions of mobile learning would be based on speculation rather than on actual experience.

The definition of mobile learning ended up as being limited to self-paced asynchronous learning because of a possible lack of awareness on its potential for collaboration, with one of the training managers not able to visualise collaborative aspects to mobile learning. Perhaps for those areas requiring further research, it will make more sense to study organisations that tried mobile learning as a full-fledged initiative. but chose to ignore certain potential benefits such as that of collaboration because they didn't feel the need to use that advantage.

7.2.3.4 Mobile learning as a formal initiative

Although a major aspect of mobile learning is its potential use as a collaborative platform for informal and formal learning, my study focussed only on the formal learning aspect. I have no doubt that outside of my study, participants were tapping into the convenience of sharing learning with peers through their mobile devices, using them for locating information on troubleshooting (perhaps accessing content repositories) and also perhaps using it for informal learning.

7.2.3.5 Time lapse

Many of the challenges, especially when it comes to usability limitation of mobile devices (screen sizes, incompatibility with Adobe Flash) or the limited and expensive bandwidth in India (where one organisation is located) could have been overcome since this interview. It is equally possible that some of my other findings have lost, or will lose, their relevance with the passage of time.

7.2.4 Contributions to Research Knowledge

In this section, I outline the main areas of my contribution to existing research. I discovered my findings differing with available literature defining mobile learning as “the processes of coming to know through conversations across multiple contexts amongst people and personal interactive technologies” (Sharples et al., 2010) and mobile learning enabling individuals to “have more social participation, maintain extensive interpersonal networks, and have contact with people not only within the social system but also outside it” (Suki & Suki, 2007). This opens the area for further research.

My findings, while agreeing with research in the area of influence of social factors on the adoption of mobile learning (Raymond et al., 2012) also contribute to by suggesting how current research can be taken further by studying whether mobile learning is likely to be more successful in organisations that tackle resistance to change through well-thought out awareness-raising initiatives.

7.2.4.1 Collaborative aspects of mobile learning

My findings differ significantly from available literature on mobile learning being more socially participative, with interactions with people not only within but also outside the social system. It also differs from literature in that mobile learning is viewed as being a self-paced, asynchronous activity, rather than enabling sharing of content from anywhere, anytime. Although these aspects

of mobile learning were defined as early as 2003, perceptions in the corporate settings I studied seem to have excluded the collaborative and communicative part of it from the working definition. Because collaboration and communication are significant aspects of mobile learning, it is worth pursuing research in this area.

7.2.4.2 Uncovering real reasons for resistance

One of the areas my study uncovered (backed even by literature) is the influence of social factors on the adoption of mobile learning. It was seen that lack of leadership support and resistance to change was a likely barrier and my findings corroborate that, with all respondents citing it as a possible barrier, although no specific examples were shared. However, what is missing is the reasons for resistance and lack of support. My findings did uncover a possible reason for lack of leadership support: leaders wanting a more convincingly demonstrated return of investment before venturing into more full-fledged mobile learning initiatives. See *section 6.2.7 How Do Technological Restrictions and Social Factors Influence Mobile Learning?* What is interesting is that at the same cost they had invested into e-learning, they could have reaped the benefits of mobile learning, and yet there were apprehensions. This is an area for academic research – given the nearly similar cost investment into e-learning and mobile learning, why are there still so few takers for the latter?

One of my possible contributions to academic research is to take the current research further by studying how far organisations make a targeted effort to overcome resistance to change among the learning community and other stakeholders. It is worth comparing whether “evangelising mobile learning” as a formal initiative affects its adoption as against trying mobile learning without any formal “induction” into its benefits and advantages. As in the case with the organisations I studied, in the absence of advocacy for mobile learning, outcomes would appear to be not very positive when it comes to leadership support. I feel a new area for academic research could be on the reasons for resistance which have nothing to do with cost or reach. This could also help us learn how organisations continue to perceive mobile learning.

7.2.5 Contributions to Practice Knowledge

Based on my findings, I am led to conclude that the corporate organisations I studied have still not fully explored the benefits of mobile learning, possibly because of resistance from leadership or from learners themselves. While a few years back, one could safely conclude that organisations did not yet have the technology to adequately support mobile learning, this is no longer true. Even devices, which were a barrier because of their limitations, no longer pose a problem today, especially in those organisations that make mobile learning friendly devices available for their employees.

From the learner's point of view, even with a BYOD policy in place, most devices today are very user friendly and with the advent of authoring tools that support fully responsive design, the device and its usability is no longer such a significant barrier.

From an organisational viewpoint, leadership and training departments would do well to advocate mobile learning before launching a formal initiative. As with any other change, it is important to address fears and concerns of learners before rolling out the change. On a practical level, one way of doing this as suggested by a training manager is through a pilot test. I would recommend this pilot test be high visibility, high on benefits kind of mobile learning, of shorter duration. The results should be tangible for learners to decrease their resistance. Although a training manager suggested product training as a pilot for getting maximum bang for the training buck, the choice would obviously differ from organisation to organisation. However, the problem with this approach is that again, it narrows down the choice of subjects to those from sales, engineering, or tech support and excludes the rest. A pilot that is of universal use to all employees in the organisation would be a better choice, because it excludes the possibility of any bias or preference for learners.

As mentioned in *Chapter 1*, the benefits of mobile learning as viewed by organisations may differ significantly from those viewed by learners, and the goals of the organisation and employee may not be always in harmony. For maximum buy-in and making the mobile learning initiative productive, it is

important that individual learning goals are aligned to organisational goals.

This way there is buy in – both at the leadership level and the individual level.

When the two are perceived as being different even by learners, there is bound to be resistance.

7.2.6 Implications for Future Research

One of the reasons most respondents felt positive about mobile learning could be because of their inherent psyche. The subjects (staff) in my research were mainly from sales, a field with people who are highly competitive, willing to take risks, more open to change, and more welcoming of any mode of learning which can accommodate their mobile work life. I wonder if people from more risk-averse backgrounds and a more conservative approach towards change would have been as enthusiastic about mobile learning. However, this is an assumption that will have to be tested against another group in the same organisation, maybe from R&D, to enable comparisons and arrive at generalisations, if any. So, I feel that the profession as an enabling factor in adoption of mobile learning bears further research.

My findings also throw up some new areas for study related to learners because mobile learning was not customised to any particular age or level of education, the mobile learning accessed by all learners being the same. Whether we need to think differently about the relevance of age on the kind of content likely to be deployed through mobile learning is worth finding answers to. This brings me to my next area of potential research below.

Another area for research is that of millennials being more likely to adopt mobile learning. In this study, I have to conclude that one of my assumptions about millennials most likely favouring mobile learning because of their tech savviness and familiarity with mobile learning is not necessarily true because other learners from various age groups were equally positive. I feel more research is warranted into this exciting area, the efficacy of mobile learning for two age segments – ‘older’ people vs. ‘millennials’ – because my findings seem to challenge popular assumptions that millennials are more likely to adopt mobile learning.

Another area of research could focus exclusively on employees with desk bound jobs vs. those who are mobile. The findings would be very interesting and challenge our assumptions of what learners perceive as the biggest benefit of mobile learning. In my study, interestingly, it was the millennials who were the only ones tied to a fixed location (retail shops), so a clear picture did not really emerge. This bears further research.

Yet another interesting area for research is why despite the awareness of the immense potential of mobile learning, organisations use it for very limited purposes. Is its usage driven mainly by the perceived effectiveness/lack of effectiveness of mobile learning, or is it driven more by organisations’ specific business needs? It is worth pursuing this through research in organisations that have experimented extensively with mobile learning and have now settled for its use only for meeting certain training objectives.

Mobile learning being used extensively in a collaborative way bears further research because social interactions and reflections on learning processes in turn also impact how mobile learning is revised (changed objects). The barriers to mobile learning adoption could be the lack of collaboration demonstrated by my research. Perhaps for this area, it will make more sense to study those organisations that tried mobile learning as a full-fledged initiative rather than those in early stages of adoption.

Another area for research is that given the nearly similar cost investment into e-learning and mobile learning, why are there still so few takers for the latter? It would make sense to focus on organisations that took up mobile learning and then abandoned it to get answers for this question.

To conclude, there are various dynamics at play in the adoption of mobile learning and knowing different points of view and perceptions give us insights into how to smoothen the path for mobile learning adoption in the corporate sector.

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