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Finding an Effective Approach for Delivering IT Skills Training to Administrative Staff in An Irish University

By
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Dissertation submitted in partial fulfilment of the requirements for MA in Training and Education (*QQI*)

Faculty of Training and Education
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April 2019

DECLARATION

I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of the MA in Training and Education, is my own; based on my personal study and/or research, and that I have acknowledged all material and sources used in its preparation. I also certify that I have not copied in part or whole or otherwise plagiarised the work of anyone else, including other learners.

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ABSTRACT

The purpose of this study is to explore an effective approach to providing training in a new IT System to upwards of 300 administrative staff in an Irish University in a comparatively short space of time.

The main questions this study sought to answer were:

- What is an effective approach to take for providing IT Skills training to administrative university staff?
- Can technology significantly improve the efficiency of delivering IT Skills training to administrative university staff?
- What preferences do administrative university staff have for learning IT Skills?

A review of the literature highlighted the role of experiential learning, social learning and technology-enabled learning in providing IT Skills training and the researcher explored how closely the findings from this mapped to the lived experiences of the administrative staff in the university in question. A mixed methods approach was used to collect both quantitative and qualitative data from the administrative staff using a sequential explanatory design involving an online survey and focus groups.

The review of the literature also highlighted a gap in the discussion around the design and delivery of IT Skills training for administrative staff in Irish universities. This research sets out to fill that gap by discussing what an effective approach to IT Skills training might look like for those administrative university staff.

The findings from the primary research strongly agreed with the review of the literature around the benefits of using experiential learning and social learning in IT Skills training but they were less definitive about the role of technology-enabled learning. The researcher recommends that using a careful blend of these methods could provide an effective approach to delivering IT Skills training to the administrative staff, but further research is warranted into the low uptake of technology-enabled learning reported in the primary data.

Keywords: IT Skills Training; Adult Learning; Social Learning; Experiential Learning; Technology-Enabled Learning; Workplace Learning

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CHAPTER ONE – INTRODUCTION

1.1. Overview

The impetus for this study is the need to find an effective approach to delivering training in a new IT System for administrative staff in an Irish University.

IT Skills fall under the mantle of hard-skills training and are specific, tangible skills where the evidence of learning is more apparent than with soft skills (Laker and Powell, 2011). In a workplace setting, such as the university in question, IT Skills training tends to be delivered on a need-to-know basis, dictated by the nature of the work involved, and usually on-the-job (Laker and Powell, 2011).

The new IT System will replace a system that has been in use for over a decade. Many of the administrative staff have received training in the current system over the years through hands-on training, demonstrations and the use of online how-to guides and videos. Currently, staff tend to request training on an "as needed" basis and the training is often one-to-one and tailored to the learner's needs. This is feasible as there are relatively small numbers of staff who need training. However, upwards of 300 staff will require training in the new IT System in a comparatively short space of time. This has highlighted the need for a more structured approach to the delivery of training to cater for a larger number of users with varying training needs. One factor that will inform any proposed framework is the required balance between the needs of the users and the reality of limited training resources and the time available for training.

The literature does not indicate a clear preference for exclusively online vs face-to-face delivery. Although there is a steady rise in technology-enabled learning (Selwyn, 2017; Whitaker, 2017), face-to-face learning remains popular in the context of workplace learning and development (Beevers and Rea, 2016). The 2015 CIPD Learning and Development Annual Survey reveals that 'face-to-face delivery is dominant and expected to remain so' (cited in Beevers and Rea, 2016, p. 101) and the 2018 Workplace Learning Report (LinkedIn, 2018) indicates that the use of instructor-led training is on the rise. Hart (2018, p. 6) asserts that the rise of 'modern workplace learning', due to the changing world of work, is influencing how staff learn, with a growing interest in self-directed learning (Knowles, 1973; Kolb, 1984) using a variety of tools. Likewise, the 2018 Workplace Learning Report (LinkedIn, 2018) shows that 68% of employees favour learning at work, 58% of employees opt for opportunities to learn at their own pace and 49% prefer to learn at the point of need. This situates the workplace as 'a site of access to learning' (Evans and Rainbird, 2004, p. 7) and provides a sound basis for this

study to explore how past IT Skills training methods in the university have been received and to understand how future training interventions can be improved.

1.2. Research Objectives and Purpose

The objective of this study is to understand how different IT Skills training methods, such as technology-enabled learning and face-to-face interventions, facilitate learning with the purpose of identifying an effective blend that could be developed into a framework for delivering staff learning initiatives. To achieve this, a review of the literature outlines the role of learning theories, especially around adult learning, in workplace training. A critical analysis of the literature discusses how different teaching and learning strategies facilitate the transfer of training and examines the case for blended learning. There is no one definition of blended learning but it is often considered to be a combination of face-to-face learning and online learning (Garrison and Vaughan, 2008) although this description usually relates to its use in an academic setting. Looking at the workplace, Hart (2018, p. 6) sees blended learning as 'delivering training using a variety of different media, formats and approaches'. For the purposes of this study, blended learning in the workplace is defined as offering staff a range of face-to-face and technology-enabled learning methods from which to choose as required.

The main questions this study seeks to answer are:

- What is an effective approach to take for providing IT Skills training to administrative university staff?
- Can technology significantly improve the efficiency of delivering IT Skills training to administrative university staff?
- What preferences do administrative university staff have for learning IT Skills?

A mixed methods approach (Tashakkori and Teddlie, 2010) will be used to collect both quantitative and qualitative data using a sequential explanatory design (Ivankova, Creswell and Stick, 2006) involving an online survey and focus groups.

1.3. Value of the Research

The immediate value of this study is that it can be used in the design of a training framework that meets the learning needs of the administrative staff while also meeting the need of the university to provide effective training that supports organisational objectives.

It also adds to the conversation around learning and development opportunities for administrative staff in Irish universities. In the literature concerning staff development in higher education institutions, discussions tend to focus on the enhancement of skills for staff involved in teaching and learning activities (Fry, Ketteridge and Marshall, 2008; National Forum for Teaching and Learning, 2015). Likewise, the literature looking at blended learning primarily focuses on its use in an academic setting (Garrison and Vaughan, 2008, 2013; Dziuban *et al*., 2018). This research fills a gap as it looks at learning and development opportunities for the administrative university staff and explores how blended learning might meet their training needs.

1.4. Research Approach

Chapter one introduces the research purpose and provides the background and rationale for the study.

Chapter two reviews the existing literature and looks at key concepts that can help address the research questions posed earlier. The role of learning theories is discussed with a focus on social learning and adult learning. The impact of blended learning is explored along with the part that technology can play in its successful delivery.

Chapter three outlines the methodology and methods used in the study. It explains how a mixed methods approach was used to collect and analyse data using both quantitative and qualitative methods to provide a deeper understanding of the research questions (Tashakkori and Teddlie, 2010) and the reason why a sequential explanatory design (Creswell and Clark, 2011) was followed.

Chapter four looks at how the quantitative and qualitative data were analysed and integrated. The findings are also discussed in relation to the literature review.

Chapter five discusses the conclusions reached leading on from the analysis and research findings. The findings are discussed in relation to the research objectives and recommendations are put forward by the researcher.

CHAPTER TWO - LITERATURE REVIEW

2.1 Introduction

A review of the literature looks to identify key concepts that may help address the research questions posed above. Firstly, the influence of the three main learning theories that have traditionally underpinned most teaching and training, namely behaviourism, cognitivism and constructivism (Carlile and Jordan, 2005), is examined. As the study looks at the use of effective learning and development methods for adults in the workplace, literature around adult learning theories such as Andragogy (Knowles, 1973) and Experiential Learning Theory (Kolb, 1984, 2014) is also discussed. Also considered is the relevance of Social Learning (Bandura, 1977) and Situated Learning (Lave and Wenger, 1991) in the context of workplace learning. Blended learning and the role that technology can play in its effective delivery is reviewed as are some of the methods used for designing blended learning such as TPACK (Koehler and Mishra, 2009; Koehler *et al.*, 2014).

2.2 The Role of Learning Theories

Learning theories look to explain how learning happens (Merriam and Bierema, 2013) and the theories that are most relevant to this study are discussed below.

Behaviourism originates in Pavlov's research into the use of conditioning to produce a change in behaviour (Merriam and Bierema, 2013; Whitaker, 2017). Behaviourism promotes evidence-based practice and is a principal feature of technical training such as workplace IT Skills (Merriam and Bierema, 2013). Although it is often viewed as encouraging passive learning due to its didactic, teacher-led approach (Biggs and Tang, 2011), behaviourism does provide positive teaching strategies (Carlile and Jordan, 2005) that are particularly effective for the competency-based elements of workplace IT Skills training. These strategies include:

- Repetition to master the tasks
- Positive reinforcement through immediate feedback
- Trial and error to achieve competency

While behaviourism is concerned with observable changes in behaviour (Harasim, 2017), **Cognitivism** looks at how information is interpreted by the brain and stored in memory (Carlile and Jordan, 2005; Whitaker, 2017). It promotes the use of more active teaching strategies that encourage deeper learning (Biggs and Tang, 2011). A number of studies looking at the implementation of IT Skills training show how providing active learning activities forms part of

best practice for successful training transfer and retention of knowledge (Dhillon, 2005; Gan Kok Siew *et al.*, 2014). Laker and Powell (2011) contend that successful technical training means that trainees can show ability not just at the training session but also on the job. In relation to workplace IT Skills training, the inclusion of hands-on practice should, when viewed through the lens of cognitivism, allow learners to bridge the learning gap between 'understanding and ability' (Light, Calkins and Cox, 2009, p. 48) by putting their knowledge and skills into action.

Constructivism takes a more student-centred approach than either behaviourism or cognitivism, and looks at how learners construct their knowledge (Whitaker, 2017). Vygotsky (cited in Light, Calkins and Cox, 2009) considers the social construction of knowledge and identifies the Zone of Proximal Development (ZPD) where learners are guided by a more "knowledgeable other" (Kolb, 2014) as they expand their knowledge and skills. This "scaffolding" of learning allows the learner to 'progressively build knowledge' (Kolb, 2014, p. 27) and it is a process that lends itself to IT Skills training in the workplace where there is a natural progression from learning the basics to gaining expertise. Scaffolding also allows the trainer to check for understanding and intervene where necessary. Studies suggest that this is something that can be crucial if the IT System in question is not particularly intuitive (Angolia and Pagliari, 2016). The expert/novice relationship also highlights the role of social interaction in workplace learning (Merriam and Bierema, 2013).

2.3 Social Learning

The concept of a 'social dimension to learning' (Jarvis, 2012, p. 11) is the basis of both Social Learning Theory (Bandura, 1977) and Situated Learning Theory (Lave and Wenger, 1991).

Social Learning Theory contends that people can learn either through direct experience (enactive learning) or vicariously by observing others (Bandura, 1977; Schunk, 2012). This premise can be extended to the workplace where learning often occurs in these non-formal and informal ways (Tight, 1996; Eraut, 2000, 2004). An article by Guest Turner and Carney (2017) discussed on-the-job training for librarians who deliver information literacy courses. They reported that 'undertaking peer-observation' (Guest, Turner and Carney, 2017, p. 2) provided them with useful knowledge that they could then apply to their own classes. In turn, the practical experience of teaching further enhanced their skills.

Situated learning considers the role that social learning plays in the workplace, especially the concept of communities of practice (Lave, 1991; Lave and Wenger, 1991). Similar to

Vygotsky's ZPD, situated learning examines how novices observe and learn from experts allowing them to gradually build up their own expertise and construct knowledge through continued participation (Lave, 1991). Research conducted by Ghosh and Scott (2009) looked at the role of communities of practice in promoting best practice among nurses for collecting and recording patient data in a patient record system. They found that giving staff the opportunity to regularly interact led to 'effective knowledge exchange and transfer' (Ghosh and Scott, 2009, p. 344) and established consistency in the use of the patient record system. Other studies have also highlighted the positive influence of social support from peers on training motivation and transfer (Burke and Hutchins, 2008; Chiaburu, Dam and Hutchins, 2010) among adult learners in the workplace.

2.4 Adult Learning

Constructivism, with its emphasis on learning through experience, has influenced much of adult learning research (Merriam and Bierema, 2013) which is particularly pertinent to workplace learning.

Andragogy (Knowles, 1973) takes the stance that adults are self-directed learners with a preference for experiential learning. Another premise is that adult learners are partial to learning that meets a need or solves a problem. This concept lends itself to workplace training for hard skills such as IT Skills, as they tend to be delivered on a need-to-know basis and usually on-the-job (Laker and Powell, 2011). Furthermore, adults need a context for their learning and to feel that it is of immediate value (Knowles, 1973; Knowles, III and Swanson, 2014). A study by Chiaburu and Lindsay (2008) indicates that training transfer is enhanced when the learner not only believes they can successfully complete a task but also believes that performing it will lead to a desired outcome.

Knowles' principles of adult learning as being self-directed and experiential are furthered by Kolb's (1984) work on **Experiential Learning Theory** (ELT) which investigates how experience is transformed into learning. Kolb has put forward the **Experiential Learning Cycle** (Kolb, 1984, 2014) as a framework designed to guide adults through the learning experience.

Kolb identifies four parts to this cycle as shown in figure 1 below:

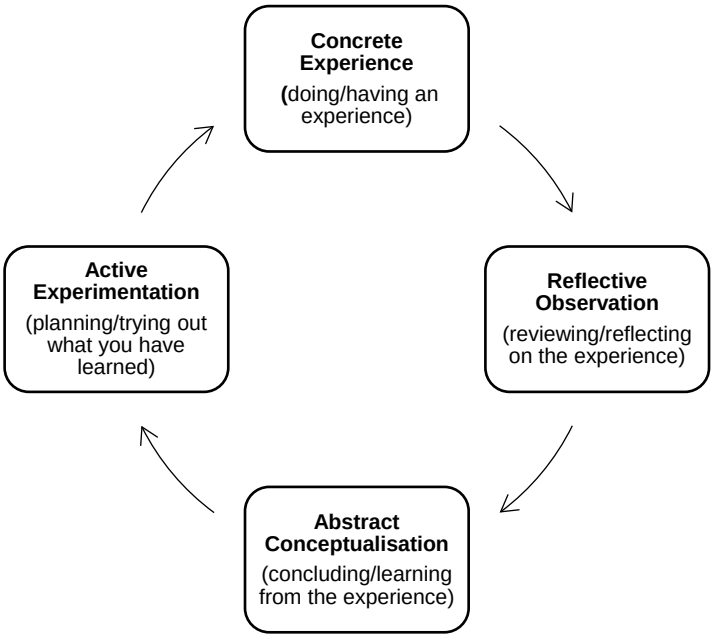

Figure 1: Kolb's Learning Cycle (1984, 2014)

A study by Angolia and Pagliari (2016) looks at the practical application of Kolb's Learning Cycle framework when designing IT Skills training and finds that it lends itself equally well to both face-to-face and online training activities. Beevers and Rea (2016) see Experiential Learning Cycle as being particularly suited to work-based training as learners have the opportunity to test out newly acquired skills and knowledge in order to sharpen their own understanding and achieve mastery (Jarvis, 2012).

To make the learning effective, the learner must experience each stage of the cycle but can commence at any point, depending on the task involved, and move back and forth as desired (Kolb, 2014). An effective training design should allow learners to spend time in each of the four stages to encourage 'learning flexibility' (Kolb, 2014, p. 150).

In his 2014 edition, Kolb revisits his work on ELT and disputes the claims of critics who, as he puts it, see ELT as 'more concerned with technique and process than content and substance' (Kolb, 2014, p. 3). He argues that ELT and the learning cycle provide a useful framework for facilitating lifelong learning (Kolb, 2014) which is a key component of adult learning, especially in the workplace (Tight, 1996; Beevers and Rea, 2016). In fact, Kolb (2014) has reimagined his cycle as a Learning Spiral to better represent the iterative nature of learning, especially in the workplace.

Kolb (2014) also observes that adult learners may fear that they have forgotten how to study and that the use of learning approaches combining 'work, study, theory and practice' (Kolb, 2014, p. 6) help alleviate that fear. This line of thinking is also reflected in the 70:20:10 model

which suggests that successful workplace learning is a blend of learning through experience, learning from others and, to a lesser extent, formal learning experiences (Lombardo and Eichinger, 1996). Like Kolb, this model highlights the importance of experiential learning while also acknowledging the impact of social learning in the workplace.

The existing literature supports the use of a blended model in adult learning (Lotrecchiano *et al*., 2013) particularly in the workplace (Hart, 2018). One study looking at the practical implementation of IT Skills training, sees a mix of face-to-face and online methods as a 'sensible solution for courses on computer software' (Huang, Lin and Huang, 2012, p. 338). This is echoed by Angolia and Pagliari (2016) who contend that purely online teaching is not suitable when technical IT training is involved and that for less intuitive IT Systems, corrective action from the trainer/expert is often needed. These findings show how a blend of approaches might be effective for IT Skills training.

2.5 The Case for Blended Learning

Within the literature, discussions about blended learning tend to focus on its use in academic settings (Garrison and Kanuka, 2004; Garrison and Vaughan, 2008; Tatnall, Wong and Burgess, 2014) but it can be argued that it also plays a part in workplace learning (Bonk and Graham, 2012) especially for the non-formal and informal learning experiences (Eraut, 2000; Taylor, 2017) that often happen in that context.

In its simplest sense, blended learning is considered to be a combination of face-to-face approaches and online learning facilitated through technology (Garrison and Vaughan, 2008; Bonk and Graham, 2012) however, recent literature describes blended learning in the workplace as 'delivering training using a variety of different media, formats and approaches' (Hart, 2018, p. 6). For the purposes of this study, blended learning in the workplace is defined as offering staff a range of face-to-face and technology-enabled learning methods from which to choose as required.

Although the appropriate ratio of face-to-face versus online in a blended learning model is often debated (Mirriahi, Alonzo and Fox, 2015), Garrison and Vaughan (2013) recommend using an organic blend that harnesses the advantages of each method while meeting the needs of the intended learning outcomes.

The literature suggests that adopting a blended learning approach is more beneficial than using face-to-face learning or online methods exclusively (Means *et al.*, 2009; Garrison and Vaughan, 2013). A study by Angolia and Pagliari (2016) into the use of point-and-click

pedagogy for teaching IT Skills, showed no significant difference between face-to-face and online delivery methods in relation to training transfer. Support for a blended learning approach is found in a study by Huang, Lin and Huang (2012) who advocate integrating eLearning with classroom-based activities for successful computer software training.

Synchronous opportunities such as classroom learning and on-the-job training can be combined with technology based, asynchronous learning such as videos, online forums or pod casts (Bonk and Graham, 2012). This approach meets the needs of adult learners to be self-directed (Knowles, 1973; Kolb, 1984, 2014; Merriam and Bierema, 2013) by providing them with different means to learn at their own pace and concentrate on what they need to know. For workplace learning, it allows staff the space and time to develop professional skills while still managing the various demands of work and life (Lotrecchiano *et al.*, 2013).

The case for blended learning is strengthened by the opinion that while asynchronous learning, facilitated by technology, gives learners some flexibility around where and when learning can occur, the potential lack of social interaction can cause demotivation (Lotrecchiano *et al.*, 2013). Similarly, synchronous learning can provide more opportunities for immediate feedback and social interaction but learners are confined to a specific place and time (Lotrecchiano *et al.*, 2013). This supports the argument for combining synchronous and asynchronous learning opportunities that allow for both flexibility and social interaction (Garrison and Vaughan, 2013) in the workplace learning space.

From the literature, it is evident that adults learners are motivated by having an input into how their learning is structured (Knowles, 1973; Kolb, 1984). Blended learning offers more control to adult learners over when, where and how they learn (Lotrecchiano *et al.*, 2013) which in turn appeals to their sense of personal agency (Bandura, 1989). Blended learning also allows learners to ‘sort the content by value’ (Bonk and Graham, 2012, p. 24) which speaks to Knowles’ (1973) principle that adults learn best when they perceive a value in the topic.

At the same time, it is acknowledged that technology is ‘changing how adults learn’ (Merriam and Bierema, 2013, p. 6) and that emerging developments in information communications technology are, as Garrison and Vaughan (2013, p. 25) believe, ‘at the core of blended learning’. This highlights that the use of technology-enabled learning requires careful consideration.

2.6 Uses of Technology in Teaching and Learning

Selwyn (2017) places an emphasis on the integral role that digital technology plays in education, but he cautions that its use must be carefully considered. Similarly, technology must 'not become a barrier to the adoption of blended learning' (Garrison and Vaughan, 2013, p. 25). For the purposes of this study, the use of technology refers to technology-enabled learning methods for teaching IT Skills rather than the use of the IT System itself.

Digital technology is enjoying a growing prominence in today's educational landscape (Harasim, 2017) and the National Forum for Teaching and Learning in Ireland have created a 'Digital Roadmap' to help navigate the use of technology in teaching and learning. One assertion made is that 'we could all be using technology more effectively to improve the way we teach, and to enhance or transform the ways in which students are enabled to engage with their learning' (National Forum for Teaching and Learning, 2015, p. v). Although the focus of the forum is on university teaching and learning activities, this approach could also be considered when designing learning initiatives for university administrative staff especially in relation to IT Skills training (Angolia and Pagliari, 2016).

Literature shows that the use of technology in teaching aligns with the core tenets of the key learning theories (Harasim, 2017; Selwyn, 2017). In particular, it strongly supports constructivist principles of learning such as Vygotsky's ZDP and the use of cultural tools and resources (Selwyn, 2017). As a tool of modern culture, technology supports constructivist learning approaches by facilitating access to information, for example through websites and computer-based training, that can provide learners with what Kolb (2014) refers to as the scaffolding they need to create their own meanings and develop their expertise.

The significance of social learning, particularly the interaction between people in the workplace, is evident in the literature (Bandura, 1977; Lave and Wenger, 1991) and technology can support this. Online forums and synchronous e-learning activities can create an online version of the traditional communities of practice (Lave, 1991; Lave and Wenger, 1991) by allowing learners to interact with people and resources that they might not otherwise encounter (Harasim, 2017; Selwyn, 2017). A study by Gray (2004) shows that online communities of practice in the workplace can provide a useful space for informal learning and knowledge sharing.

Grossman and Salas (2011) highlight how the use of a realistic training environment positively benefits the transfer of training. To this end, computer-based training can offer authentic learning activities that are also in line with the principles of both situated learning (Lave and Wenger, 1991) and Kolb's (1984, 2014) experiential learning.

Technology brings a new facet to learning by providing a means of accessing and revisiting information as required (Biggs and Tang, 2011). It can facilitate movement around Kolb's Learning Cycle (Kolb, 1984, 2014) by offering chances for reflective observation and abstract conceptualisation.

While technology can add more flexibility to learning design (Harasim, 2017), it is important to determine at the outset how it will be incorporated into the overall plan (Light, Calkins and Cox, 2009). The literature shows a consensus that, rather than dictate the pedagogy, technology should support and enhance the chosen learning strategies (Biggs and Tang, 2011; Beetham and Sharpe, 2013; Selwyn, 2017) as part of the learning design.

2.7 Designing Blended Learning

Pedagogy looks at how educators provide learners with 'ways of knowing as well as ways of doing' (Beetham and Sharpe, 2013, p. 2) and 'design for learning' (Beetham and Sharpe, 2013, p. 7) provides a framework for structuring and implementing a given learning situation. Both concepts are concerned with the application of learning theories to the practice of learning.

Any blended learning design should consider the 'grounded needs of the intended educational experience' (Garrison and Vaughan, 2013, p. 24) and providing effective blended learning depends on combining the right tools to achieve the required learning outcomes (Bonk and Graham, 2012). This highlights the role that **outcomes-based teaching learning (OBTL)** and the concept of constructive alignment (Biggs and Tang, 2011) plays in the design process. OBTL focuses on what the learner should be able to do after the learning experience. With OBTL, the teacher explicitly states what the learner will learn (the outcomes) and uses constructive alignment to link the content and assessment with these outcomes. This is accomplished by providing the learner with an opportunity 'to perform the intended outcome itself' (Biggs and Tang, 2011, p.11). In the context of learning theories, OBTL satisfies the adult learner's need to know about what they will learn and how they will put it into practice (Knowles, 1973; Kolb, 1984; Merriam and Bierema, 2013). OBTL lends itself to work-based training, such as IT Skills training, where specific competencies must be learned, and the situation provides opportunities for immediate feedback and formative assessment.

As well as having clear objectives, it is important that the content is made accessible by providing information in multiple modes that appeal to a variety of learners (Beevers and Rea, 2016). The principles of **Universal Design for Learning (UDL)** (Rose and Meyer, 2006)

provide a helpful guide for designing a learning framework that can address the needs of a diverse group of learners (Hall, Meyer and Rose, 2012). UDL recommends the use of various means of instruction, action and engagement to cater for different learning needs and abilities (Rose and Meyer, 2006). Blended learning can account for the different needs of learners by representing information in various ways such as face-to face, video tutorials, interactive computer training. UDL can also support constructivist learning principles by providing a means of scaffolding information to promote deeper learning (Kolb, 2014).

In a blended learning course, careful curation of the content will help learners avoid becoming overwhelmed with information and not having the time to reflect and engage in deeper learning (Garrison and Vaughan, 2008). In relation to workplace learning, information can be organised and bundled into smaller chunks of knowledge (Bonk and Graham, 2012) and the content can be accessed or delivered as required. The findings of the 2018 Workplace Learning Report would seem to support this approach. The report shows that 58% of employees prefer to learn at their own pace and 49% want to learn at the point of need (LinkedIn, 2018). In terms of effective training design, it underscores the need to offer learners the chance to focus on the topics that are most relevant to them while making the information accessible at the point of need (Taylor, 2017). Using a **Learning Management System** to facilitate access to content is worth considering as part of the learning design and delivery process (Beevers and Rea, 2016).

Educational technology plays a vital role in the design of blended learning approaches and can boost the 'pedagogical role of the teacher' (Selwyn, 2017, p. 100) by facilitating a 'wide range of teaching and learning activities addressing a wide range of learning outcomes' (Biggs and Tang, 2011, p. 78). There are a several models that provide a framework for the appropriate integration of technology with pedagogical approaches and content design.

A prominent model is **TPACK**, short for Technology Pedagogy and Content Knowledge, (Mishra and Koehler, 2006; Koehler and Mishra, 2009; Koehler *et al*., 2014). The TPACK model builds on the work of Shulman's work on Pedagogical Content Knowledge (PCK) (cited in Koehler and Mishra, 2009) and introduces the idea of technological knowledge (TK) which it adds to the existing considerations of pedagogical knowledge (PK) and content knowledge (CK) (Mishra and Koehler, 2006; Koehler and Mishra, 2009; Koehler *et al.*, 2014). As well as understanding what they need to teach (content) and how to teach it (pedagogy), 21st Century educators also need to know how to use relevant technology and seamlessly incorporate it into their design (Whitaker, 2017). TPACK allows educators to identify and manage the interactions between the three types of knowledge, for example where technology is being used in the design of a specific learning intervention to facilitate the delivery of specific content

(Koehler *et al.*, 2014). A study into the practical application of TPACK (Elliott, 2018) suggests that it is well suited for use in the design of staff development programmes in third-level institutions. As the use of digital technology in learning activities grows, the use of frameworks like TPACK will have increasing relevance.

2.8 Themes Emerging from Literature

The workplace is 'a site of access to learning' (Evans and Rainbird, 2004, p. 7) and the literature suggests that there is room for both face-to-face activities and technology-enabled learning (Garrison and Vaughan, 2013; Beevers and Rea, 2016).

The review of the literature provides a rich source of ideas and questions, particularly around learning strategies, uses of blended learning and the role of technology. In particular, the literature identifies the key consideration that adult learners tend to be self-directed and are motivated by seeing the value in what they are learning (Knowles, III and Swanson, 2014). The importance of learning by experience is also highlighted (Kolb, 2014) and the role of social learning in the workplace (Bandura, 1977; Lave, 1991), be it face-to-face or enabled by technology (Harasim, 2017), also emerges as a strong theme. The literature suggests that using a blend of methods appeals to adult learners and should, by extension, lend itself to effective IT Skills training in the workplace.

CHAPTER THREE – METHODOLOGY

3.1 Introduction

A research paradigm is a ‘shared belief system or set of principles’ (Cohen, Manion and Morrison, 2011, p. 10) that gives rise to an ‘interpretive framework’ (Denzin and Lincoln, 2011, p. 13) intended to guide action. A research paradigm consists of three elements: an ontology (the nature or structure of reality), an epistemology (how reality is understood) and a methodology that describes the strategies and methods that will be used to gather information (Crotty, 1998; Denzin and Lincoln, 2011).

For any piece of research, it is essential to establish what methodologies and methods will be used and to then be able to justify why they were chosen (Crotty, 1998). The methodology and methods used should be guided by the research question(s) being asked (Crotty, 1998). Creswell (2003) identifies the three main frameworks used for carrying out research as quantitative, qualitative and mixed methods.

Quantitative research is traditionally used in the natural sciences and deals with measurable, set facts (Bell, 2014). Qualitative research explores how people construct their own meanings (Cohen, Manion and Morrison, 2011) and is a feature of Social Sciences research. Mixed Methods is a more recent framework that allows researchers to employ approaches from both quantitative or qualitative methods to provide more robust data analysis (Creswell, 2003) and achieve a deeper understanding of results.

3.2 Mixed Methods Research

For this study, a mixed methods approach was used to collect and analyse data to provide a deeper understanding of the research questions (Tashakkori and Teddlie, 2010). A mixed methods approach combines the strengths of both quantitative and qualitative methods while overcoming the limitations of each individual method (Creswell and Creswell, 2017).

Using a mixed methods approach allows the researcher to ‘capture the trends and details of a situation’ (Ivankova, Creswell and Stick, 2006, p. 3) more effectively than relying on either quantitative or qualitative methods alone. It was considered appropriate for this study as the researcher was interested in gaining a deeper understanding of the research questions posed and felt that qualitative data could help explain or clarify the quantitative results by providing individual perspectives on the general data trends (Creswell, 2013).

Creswell (2003) contends that to carry out a piece of research it is necessary to use a framework incorporating the researcher's philosophical ideas (ontology and epistemology) as well as the research strategies and methods to be employed. The researcher chose Pragmatism as the philosophy to underpin the mixed methods approach used for this study because it supports the use of more than one method to reach an answer to a research question (Creswell and Clark, 2011) and provides a 'more workable solution' (Johnson and Onwuegbuzie, 2004, p. 17) which suited the practical nature of the study.

There are a number of mixed methods approaches and the one used for this study was a two-phase sequential explanatory design (Creswell and Clark, 2011). Sequential explanatory design is widely used by researchers and phase one involves the collection and analysis of quantitative data followed by a phase two collection and analysis of qualitative data (Ivankova, Creswell and Stick, 2006). According to Creswell and Creswell (2017), the qualitative data should provide a deeper insight into the findings of the quantitative results.

For this study, the approach was used to explore what training methods the staff had experienced in relation to learning IT Skills in the workplace and what they had found effective. Phase one saw quantitative data collected via an online survey and phase two involved qualitative data collected from the outputs of three focus groups. The results were integrated during the analysis and discussion phase of the process.

Phase	**Procedure**	**Product**
Quantitative	Anonymous Online Survey	Numeric data
Quantitative Data Analysis	Data screening – univariate, multivariate	Descriptive Statistics
Qualitative	Focus Groups with semi-structured questions	Text Data (notes and transcripts)
Qualitative Data Analysis	Coding and thematic analysis	Key themes – find similarities/differences
Integrate Quantitative and Qualitative results	Interpret and analyse the results	Discussion of results Implications Future research.

Table 1: Sequential Explanatory Design Sequence. Adapted from Ivankova, Creswell and Stick (2006)

3.3 Methods Used

Firstly, an anonymous online survey was used to gather quantitative data on participants' prior learning experiences with IT Systems in the university in question. The literature review was used to inform the questions for the survey. Participants were users of IT Systems in the university and 223 administrative staff were invited to take part via an email with a link to the survey. A participant information sheet was included with the email and the voluntary consent form was built into the survey.

At the end of the survey, participants were asked if they wanted to take part in one of the follow up focus groups. This information was gathered on a separate form to preserve the anonymity of the survey responses.

For the second stage, a smaller group of participants were invited to take part in focus groups. Semi-structured, open-ended questions were used to gather qualitative data about the participants' experiences of using different training interventions and examine the key themes that emerged from the survey phase. Ideas emerging from the focus groups were thematically coded and categorised to make meaning.

3.4 Validity and Reliability

Cohen, Manion and Morrison (2007) see validity and reliability as requirements for both quantitative research and qualitative research. They identify several types of validity and one that was particularly pertinent to this study was content validity (Cohen, Manion and Morrison, 2007). As recommended by Denscombe (2014), a pilot of the survey was conducted to ensure that the questions were appropriate, could be answered effectively and met the objectives of the study. This also helped address the issue of internal validity (Cohen, Manion and Morrison, 2007) as the researcher wanted to be sure that the questions being asked would answer the research questions.

Using an online survey instrument with specific pre-defined questions and answers also introduced the concept of reliability into the research design as, under similar circumstances, another researcher could expect to deploy the survey and achieve a similar outcome (Denscombe, 2014).

To maintain validity, the participants for the qualitative phase two were drawn from the pool of participants from phase one (Creswell and Creswell, 2017). For the qualitative phase, the focus group questions were designed to encourage the participants to provide authentic

answers in a way that allowed the researcher to interpret the data as accurately as possible (Cohen, Manion and Morrison, 2011) to satisfy the research questions.

Using a mixed methods approach provided the opportunity to compare and contrast findings from one method with the results of another and allowed for the triangulation of the data which, as Denscombe (2014) asserts, gives a better sense of the accuracy of the findings.

3.5 Limitations of Study

The research was limited to administrative staff in one Irish university. The methodology used concerned the capturing of data that would help inform the design of a learning framework to meet a specific training need for the university in question. Transferability may be limited as a result.

3.6 Ethical Considerations

The growing use of qualitative and mixed methods research has seen an increased focus on the area of research ethics in recent years (Miller *et al*., 2012) and rigorous ethical consideration was given to this study.

The necessary ethical permissions were sought from the appropriate boards (Smith, 2015) in both Griffith College Dublin (Appendix 1) and the university where the primary data was gathered.

All participants were given an information sheet outlining the aims, objectives and methodology of the study (Appendix 2). The right to withdraw from the research was also made clear. No participants were under 18 and the intended use of any data collected was clearly disclosed to participants (Smith, 2015). Informed consent was sought for both the online survey and the focus groups (Appendix 3) and assurances of confidentiality were given to all participants (Miller *et al*., 2012). Permission was sought for the audio recordings made during the focus groups. Data was stored securely on the researcher's laptop as well as a backup USB memory stick and both were encrypted.

3.7 Survey Design and Implementation

Surveys have become a ‘dominant collection practice’ (Blair, Czaja and Blair, 2013, p. 1), especially in the social sciences, and continue to grow as a significant means for gathering data and understanding peoples’ interests and beliefs (Rea and Parker, 2014). They are a regarded as a key instrument for gathering primary data and carrying out original research (Rea and Parker, 2014) and are particularly suited to studies that have a tight timescale (Denscombe, 2014). The researcher opted to use a survey instrument for the first phase of the study as it allowed them to collect quantitative data from a specific group of people in a short space of time.

Surveys are used to collect information from a sample of people chosen from a carefully defined population (Blair, Czaja and Blair, 2013). For the purposes of this study, the population was defined as administrative staff in the university who used certain IT Systems as part of their job. To reduce selection bias (Blair, Czaja and Blair, 2013), permission was sought from the six College Principals in the university to access the administrative staff in their colleges. Permission was also sought from the Director of Registry and the Director of International Affairs to access staff in their respective areas. Three College Principals and both Directors granted permission which resulted in 223 staff being invited to participate in the survey. 84 respondents started the survey with 74 completing.

For this study, the survey was used to gain an insight into the experiences of the administrative staff with IT Systems training in recent years as well as their opinions on the learning methods used. To achieve this, a fixed questionnaire with specific pre-defined questions and answers was used (Blair, Czaja and Blair, 2013). The survey comprised of nine questions with a mix of answer styles and took approximately five minutes to complete (Appendix 4). The survey was kept intentionally short to reduce the instances of non-response (Blair, Czaja and Blair, 2013) among the participants. As the survey was deployed online, clear instructions were provided for each question (Rea and Parker, 2014) to compensate for the fact that the researcher would not be on hand to guide the respondents through the process.

Using a fixed questionnaire allowed the researcher to deploy the survey online which served to maintain the anonymity of respondents and mitigate researcher bias (Rea and Parker, 2014). The survey was crafted using an online survey tool and a web collector link was created. This link was then included in an email to participants outlining the nature of the study and inviting them to take the survey. The email also stressed that participation in the study was entirely voluntary and a participant information sheet was included as an attachment to the email. In an effort to avoid coverage bias (Blair, Czaja and Blair, 2013), the link to the

survey was sent to the work email addresses of the participants as they would have access to the internet via their work computers.

3.8 Focus Group Design and Implementation

The use of a particular research method should be based on how suitable it is for finding the answers to specific questions (Creswell and Creswell, 2017) and while some researchers avoid using focus groups, they are an appropriate research tool that can be tailored to collect information about most topics (Stewart and Shamdasani, 2014) and supply qualitative data (Krueger and Casey, 2014). Focus groups are suitable for collecting opinions and gaining an understanding of how people feel and think about an issue (Krueger and Casey, 2014; Stewart and Shamdasani, 2014). The group dynamics of focus groups tends to draw out information that other methods of data collection cannot elicit (Taylor, Bogdan and DeVault, 2015).

Focus groups allow for the use of open-ended questions which can help the participants feel that their contribution is respected and of value to the research (Bell, 2014; Krueger and Casey, 2014). Focus groups are also considered effective for assessing training needs (Krueger and Casey, 2014) which was relevant to this study.

One criticism of focus groups is that members tend to intellectualise their behaviour (Krueger and Casey, 2014) and not share their true beliefs. Krueger and Casey (2014) believe that this can be alleviated by using multiple methods of inquiry such as observation and exercises along with the questions.

The main characteristic of a focus group scenario is that the participants have a common identity (Bell, 2014; Stewart and Shamdasani, 2014) and for this study, the participants were all users of administrative IT Systems in the university in question.

As the purpose of the qualitative phase was to provide more detail about the results of the quantitative phase, it was deemed appropriate to recruit participants from the respondents to the online survey (Creswell and Clark, 2017). Participation in the focus groups was voluntary and self-selecting (Krueger and Casey, 2014) via a separate sign-up form included at the end of the online survey. Nineteen staff members indicated an interest in participating in the focus groups and initially thirteen signed up to attend one of three sessions. Ultimately however, due to time constraints and illness, eleven staff took part. Informed consent was given by each participant by means of a printed consent form completed at the start of each session.

Three groups were used in order to identify trends and patterns that emerged from the discussions and to provide a basis for compare and contrast (Krueger and Casey, 2014). As

there were eleven participants in the end, the researcher decided to split them into one group with three participants and two groups with four participants in each. While between five and eight people is generally considered an optimal size for a focus group (Krueger and Casey, 2014), research also indicates that having smaller groups, for example between four and six people, can encourage everyone to take part and lead to a more productive use of time (Prince and Davies, 2001; Munday, 2006) especially in the case of social sciences research like this study.

Information was gathered through focused discussions using semi-structured, open-ended questions (Stewart and Shamdasani, 2014) and the researcher used multiple ways of questioning to check for authenticity (Krueger and Casey, 2014). Observation of behaviour and actions during the focus groups added nuance to the data collected (Krueger and Casey, 2014). Each focus group lasted between 60 and 90 minutes.

For each of the focus groups, participants were asked the same four, open-ended questions:

1. How has previous IT Skills training gone?
2. What worked well in previous IT Skills training?
3. What didn't work in previous IT Skills training?
4. What could be done to improve future IT Skills training?

For questions one, two and three the participants filled out answers on post-it notes that were collected and collated by the researcher and displayed on a piece of flip chart paper (one per question). This allowed each participant to contribute to the discussion without feeling intimidated and also reduced the influence of more dominant participants (Krueger and Casey, 2014). It also reduced moderator bias and groupthink (Stewart and Shamdasani, 2014) as the participants were writing down their own individual thoughts and impressions. The written comments were then discussed and elaborated upon during a group discussion. Question four was a group discussion with the researcher capturing comments and ideas on a sheet of flip chart paper. The researcher used probing questions to tease out some of the comments. All discussions were audio recorded to allow the researcher to check the accuracy of what was captured during the discussions and to see if anything was missed.

The focus groups produced qualitative data using 'words and visual images as the unit of analysis' (Denscombe, 2014, p. 245). This aided the construction of what Smith (2015) calls the narrative description.

Data analysis was inductive rather than deductive (Cohen, Manion and Morrison, 2011) and involved note-based analysis (Krueger and Casey, 2014). Data was collected by thematically coding the emerging ideas and distilling information into specific categories to make meaning

(Krueger and Casey, 2014) and to allow the data to be linked back to the themes that emerged from the literature review and the survey.

The findings from both the survey phase and the focus groups are covered in the next chapter.

CHAPTER FOUR – ANALYSIS and RESEARCH FINDINGS

4.1 Introduction

This section presents the analysis and findings from both the quantitative data collection (online survey) and the qualitative data collection (focus groups).

The literature review showed that providing opportunities for experiential learning and social learning are key factors for adult learners, especially in the workplace. It also pointed to the role that technology can play in providing flexible training options and alleviating time pressures. The survey was designed to establish if these findings were borne out in the lived experience of the staff while the focus groups provided further insight into the experiences of the administrative staff when it came to receiving IT Skills training.

The results of the survey are discussed first with reference to the topics discussed in the literature review. Next the themes that emerged from the focus groups are considered and linked back to the findings from the literature review and the survey data.

4.2 Survey Analysis

Of the 223 administrative staff invited to take part in the survey, it was completed by 74 respondents This represented a response rate of 33% which might be considered low but as Cohen, Manion and Morrison (2007) contend, online surveys typically have a lower response rate than those carried out face-to-face.

Where non-response bias is a concern, Rea and Parker (2014) recommend checking the response rates of relevant subgroups. If the response rates are similar to the overall population, then the impact of the bias might be lessened. Questions two and three captured demographic information about the respondents that provided subgroups that could be compared for similarity in response rates.

4.2.1 Demographic Questions

4.2.1.1 Area of Work

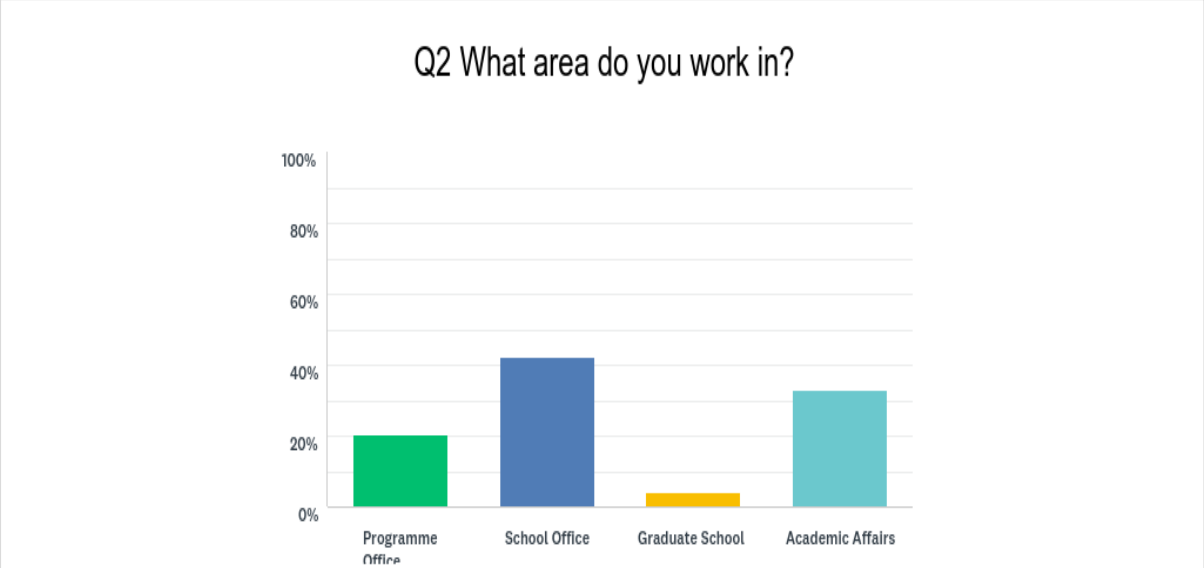

Figure 2: Area of Work

Respondents were asked to indicate the area in which they worked, choosing from one of four categories. 73 answered and 1 skipped the question (figure 2). The answers were:

- 42.47% (31) of respondents were from School Offices
- 32.88% (24) were from Academic Affairs
- 20.55% (15) worked in a Programme Office
- 4.11% (3) were Graduate School staff

The researcher considered this to be a reasonable reflection of the overall composition of administrative staff in the university as the combined staff numbers in the School Offices would be higher than those in the Programme Offices and comparable to the two units included from Academic Affairs. Similarly, the Graduate Schools tend to be smaller units with fewer staff.

4.2.1.2 Length of Service

Respondents were also asked about how long they had worked in the university with all 74 respondents answering (figure 3).

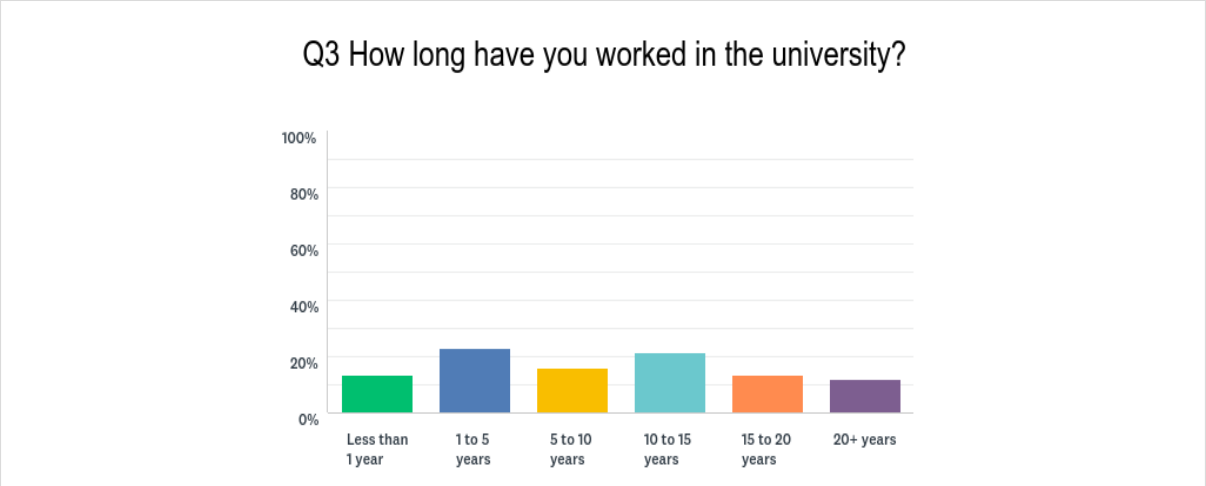

Figure 3 Length of Service

Results showed that 22.97% of respondents (17) had worked in the university for between one and five years and another 13.51% (10) had been there for less than one year. Combined, these figures indicate that just over one third (approximately 36%) of respondents are reasonably new to the university.

Among the more established staff members, the breakdown was as follows:

- 16.22% (12) had been there for between 5 and 10 years
- 21.62% (16) had been there between 10 and 15 years
- 13.51% (10) had been there between 15 and 20 years
- 12.16% (9) had been there over 20 years

Based on this, the researcher was satisfied that there was good representation across each of the answer options.

4.2.1.3 Use of IT Systems

Question four (Q4) looked at how often staff used four specific administrative IT Systems with five answer options available ranging from “daily” to “never” (figure 4).

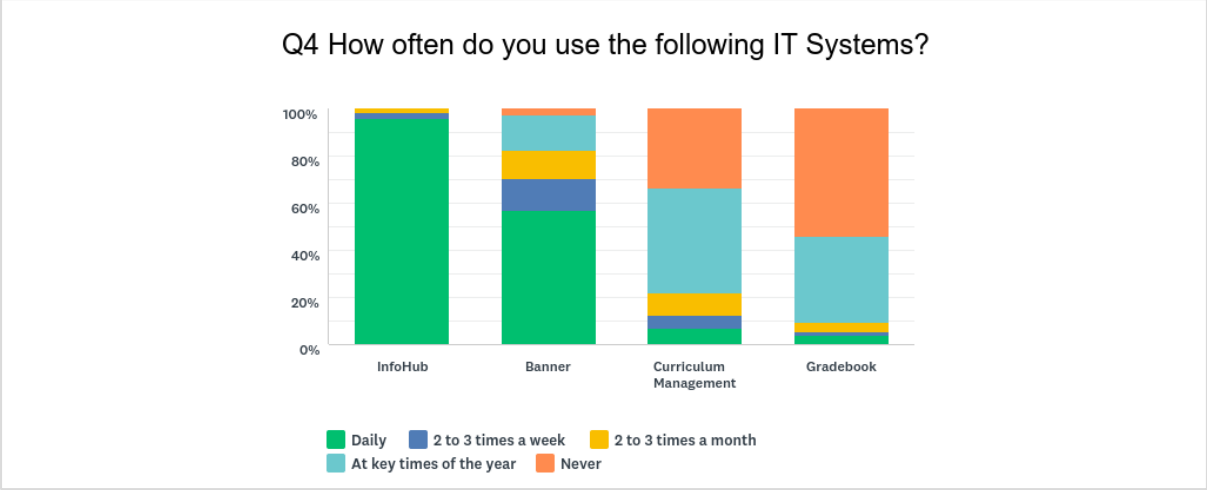

Figure 4: Use of IT Systems

The results showed that 71 respondents (95.95%) used InfoHub daily and 42 (56.76%) used Banner daily. Responses also showed that the Curriculum Management System and Gradebook tended to be used at key times of the year or not at all. The researcher felt that this was a fair reflection of how the systems are used in the university. Both InfoHub and Banner are used as part of several regularly occurring key tasks while the Curriculum Management System and Gradebook are used by certain cohorts of staff for specific tasks where the main activity only happens two or three times a year.

4.2.2 Staff Attitudes to IT Skills Training

The literature review highlighted the importance of learning by experience (Kolb, 1984, 2014) in the workplace as well as the role of social learning (Bandura, 1977; Lave, 1991). The benefits of technology-enabled learning (Harasim, 2017) also emerged as a theme. The remaining questions in the survey focused on the IT Systems used by the administrative staff and respondents were asked about their overall training preference for learning IT Skills as well as how useful they found the different methods in certain scenarios.

Firstly, the researcher was interested in exploring if the attitudes of the staff towards IT Skills training supported the findings from the literature. Then an analysis was carried out to see how learning preference matched up to perceived usefulness

4.2.2.1. Overall Training Preferences

Respondents were asked to rank four different training methods in order of overall preference for receiving IT Skills training. These were:

- Hands-On Training
- Asking/Observing a Colleague
- Demonstrations/Presentations
- How-To Guides/Videos on the University website

A scale was used with 1 being most preferred and 4 being least preferred (figure 5).

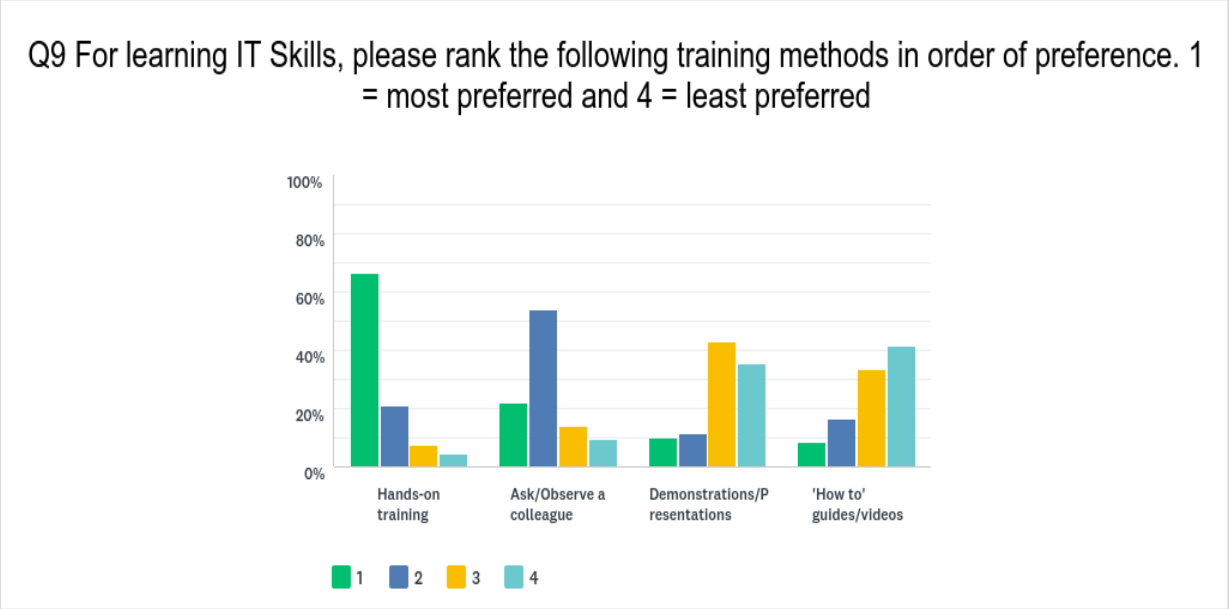

Figure 5: IT Skills Training - Order of Preference

Overall, hands-on training emerged as the most preferred method with 66.67% (44 respondents) giving it their number one vote. Asking/observing a colleague received the next highest amount of number one preferences while 54.17% (39 respondents) made it their number two preference. Demonstrations/presentations and how-to guides/videos had comparatively fewer number one and number two preferences. Demonstrations/presentations received the most amount of third preferences with 42.86% (30 respondents) while 41.67% (30 respondents) found how-to guides/videos to be the least preferred method.

The researcher felt it would be useful to look at the results for the four areas of work: Programme Office, School Office, Graduate School and, Academic Affairs (Appendix 5), to examine how the responses from these subgroups compared to the overall training preferences expressed. In keeping with the overall findings, each area showed a marked preference for the use of hands-on training. Asking/observing a colleague was also popular while the use of demonstrations/presentations and how-to guides/videos was less preferred.

The researcher also looked at the cohorts in the length of service subgroup (Appendix 5) and observed that while the number of first preferences for each of the four training methods varied depending on the length of service, there was a definite preference for hands-on training expressed by each cohort which is discussed in more detail later in the analysis.

The strong preferences expressed for hands-on training and asking/observing a colleague agreed with the findings in the literature review about the importance adult learners place on learning by experience and learning from peers. However, even though the literature pointed to the role of technology in supporting workplace learning, the preference for using the online how-to guides/videos was quite low among the administrative staff.

4.2.2.2 Types of Training Received

With strong overall preferences displayed for hands-on training and asking/observing a colleague when it comes to learning IT Skills, the researcher next looked at what uptake there had been among the administrative staff for the various types of IT Skills training available.

Question five (Q5) asked respondents about the types of training they had received in the previous four years for each of the four IT Systems. They were given six options and could select all that applied. The six options were:

- Planned hands-on training with a trainer
- Hands-on training with a colleague
- Demonstrations/Presentations
- Asking/Observing a colleague
- ‘How-to’ guides/videos on the university website
- None of these

For ease of analysis, responses from the two hands-on options were combined (figure 6). Although it should be noted that for each system, receiving hands-on training from a colleague was more popular than hands-on training with a trainer (Appendix 6).

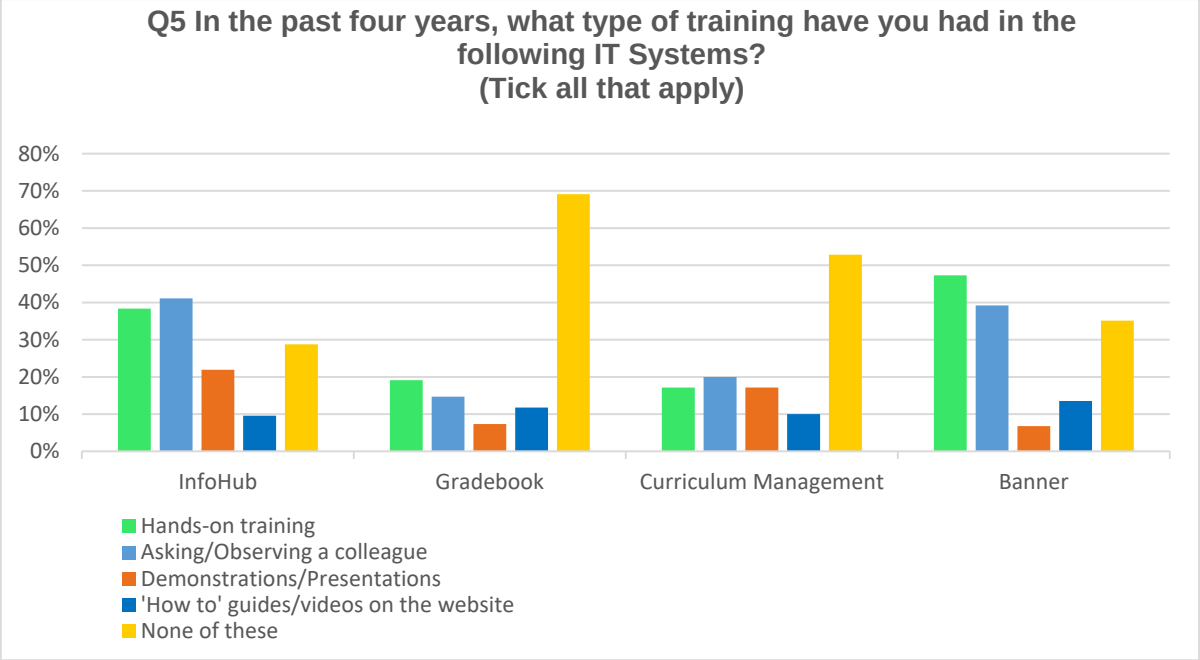

Figure 6: IT Skills Training in Past Four Years

The results showed that all the training methods had been utilised to varying degrees for each of the IT Systems. For InfoHub, the hands-on training options (38.36%) and asking/observing a colleague (41.10%) were the most widely used. It was similar for Banner with 47.3% of respondents having used hands-on training and 39.19% opting for asking/observing a colleague. Since Q4 showed these two systems to be more widely used, a greater use of these types of "on-the-job" training methods might well be expected. Although Gradebook saw less uptake in training overall, hands-on training (19.12%) and asking/observing a colleague (14.71%) came out slightly ahead of how-to guides/videos and demonstrations/presentations. For the Curriculum Management System, asking/observing a colleague (20%) came out just ahead of hands-on training and presentations/demonstrations (which had 17.14% each). The use of online how-to guides/videos as a training method was low overall but slightly higher for Banner and Gradebook than for the other two systems.

For each of the systems there were respondents who had used none of the training methods mentioned. Notably, for the Curriculum Management System and Gradebook a significant number of respondents, 69.12% and 52.86% respectively, had not availed of any training methods in the previous four years. The findings from Q4 showed that these two systems have fewer respondents using them than InfoHub and Banner, and they are also used less frequently throughout the year. This suggests that the instances of training might be lower for the Curriculum Management and Gradebook systems.

Q9 showed that hands-on training and asking/observing a colleague were the preferred overall training methods for IT Skills and Q5 showed that these were also the two most used IT Skills

training methods by the administrative staff over the previous four years. The researcher was satisfied that the learning preferences for IT Skills expressed by the administrative staff were reflected in their uptake of IT Skills training.

4.2.2.3 Usefulness of Training Methods

Question six (Q6) asked how useful staff found four different training methods; hands-on training, asking/observing a colleague, demonstrations/presentations and online how-to guides/videos, for learning the basics. Question seven (Q7) asked the same about learning a specific task and question eight (Q8) asked about refresher training (see graphs in Appendix 7). For consistency of analysis, each of these questions used a five-point Likert scale to capture the answers. The options given were:

- Very Useful
- Useful
- Neutral
- Not Useful
- Have Not Used

The combined findings are shown in figure 7 below with hands-on training and asking/observing a colleague emerging as the methods considered most useful.

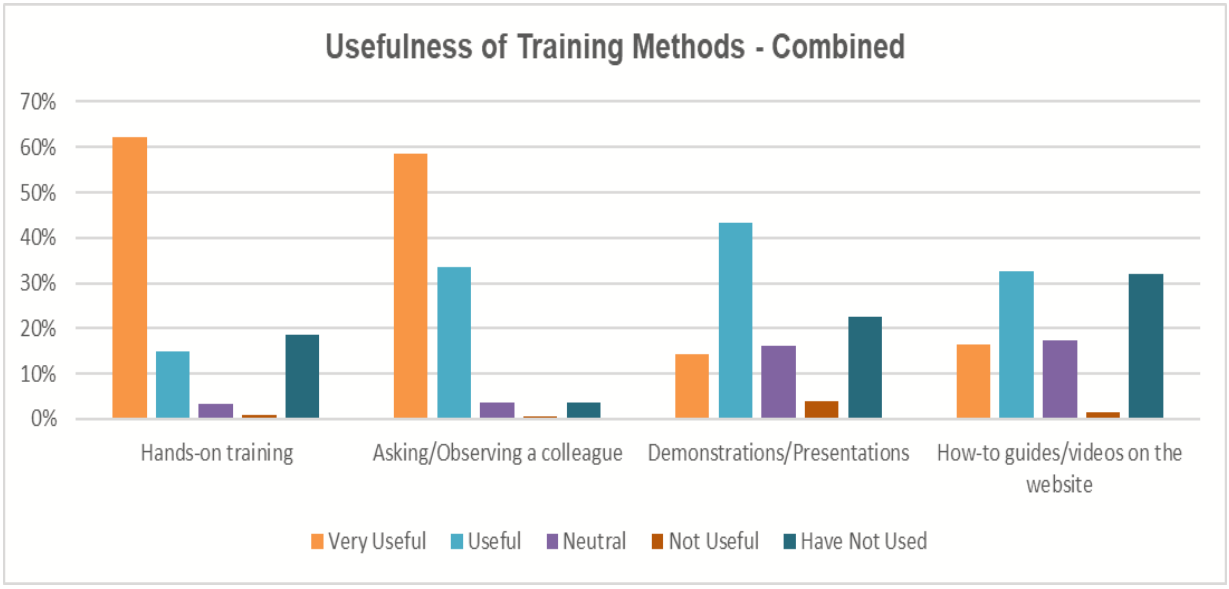

Figure 7: Usefulness of Training Methods (Combined)

The researcher looked at each of the four training methods in terms of perceived usefulness and linked that back to the preferences expressed in Q9 and the responses to Q5 about the types of training received. The findings are outlined below:

(i) Hands-on Training

Responses to Q5 showed that administrative staff had used hands-on training quite widely in the previous four years and this reflects the findings from Q9 that place it as the most preferred overall method of IT Skills training. Further analysis of the length of service cohort corroborates this preference for hands-on training (Appendix 8). For staff who had been with the university for less than a year, hands-on training was the top preference for approximately half of that cohort. Staff who had been with the university for between one and five years also gave hands-on training the highest number of first preferences. For staff working in the university for five to ten years, hands-on training received an equal amount of first preferences as asking/observing a colleague while the ten to fifteen years cohort showed more first preferences for hands-on training than the other three methods combined. The numbers expressing a first preference for hands-on training increased significantly among staff who had worked in the university for fifteen to twenty years or for twenty years plus.

Looking at perceived usefulness of the different training methods for learning the basics (Q6), results showed that hands-on training clearly emerged as the most popular method with 71.23% citing it as “very useful”. The results for learning a specific task (Q7) showed a similar trend with 66.20% finding hands-on training “very useful”. The trend was slightly reversed when it came to refresher training (Q8) with asking/observing a colleague (58.90%) coming out ahead of hands-on training (48.57%) in the “very useful” category. This may be because the refresher information is often required at point-of-need and simply asking a colleague may be the most expedient option.

Users of the new IT System will all need to learn the basics of navigation and certain functions. The survey results showed an overall preference for hands-on training for learning the basics and the researcher looked at responses from the subgroups to check for agreement or to uncover any differences.

Firstly, the researcher used Excel to carry out a cross-tabulation of each of the four areas of work measuring how useful they found each of the training methods queried in question six. The five options were given each given a numeric value with Very Useful = 1. For each area, a count was then carried out to see how many number 1 values each method had and expressed that as a percentage of the total number of respondents in that area. For each area,

a simple pie-chart was created to compare the data and look for trends or outliers (Appendix 8). Across all areas, hands-on training was considered “very useful” by the majority of respondents.

A similar cross-tabulation exercise was carried out using the length of service options from question 3 as variables (Appendix 8) and the researcher noted that there was some variation between the different length of service cohorts in the extent to which they found hands-on training useful for learning the basics. For staff who had been working in the university for less than one-year, hands-on training was considered slightly more useful than the other methods. The researcher also observed a more definite leaning towards hands-on training as “very useful” for staff who had worked in the university for one to five years, five to ten years and fifteen to twenty years respectively. However, for staff who had worked there for between ten and fifteen years, asking/observing a colleague was considered more useful than hands-on training while staff who had been there for twenty years plus very clearly saw hands-on training as a “very useful” method.

Overall, the researcher felt that the high preference for hands-on training reported in Q9 corresponded with how useful administrative staff found that method for learning IT Skills, especially when they were basic or new skills.

(ii) Asking/Observing a Colleague

The literature review discussed Bandura’s (1977) belief that learning from others can be just as effective as learning from experience. This assertion is supported by the fact that asking/observing a colleague came out as the second most preferred training method (Q9) while responses to Q5 showed that, in the previous four years, asking/observing a colleague was a well-used training method, especially for InfoHub and Banner.

Looking at the training preferences for the area of work cohorts (Q2), asking/observing a colleague came a close second to hands-on training for staff in the School Offices, Programme Offices and Academic Affairs. A look at the length of service cohorts (Q3) tells a similar story. Staff with less than one year’s service gave it joint second preference along with demonstrations/presentations. It was a clear second preference for staff working in the university for between one and five years while for staff working in the university for five to ten years, asking/observing a colleague received an equal amount of first preferences as hands-on training.

For learning the basics (Q6), 58.11% of respondents considered asking/observing a colleague as “very useful” while for learning a specific task (Q7), 58.90% cited asking/observing a colleague as “very useful”. For Q6 and Q7, hands-on has the most “very useful” responses but when it comes to refresher training (Q8), asking/observing a colleague (58.90%) comes out ahead of hands-on training (48.57%) in the “very useful” category.

Looking at the length of service cohorts, asking/observing a colleague received a high number of “very useful” responses from staff who had been there for less than one-year. Among staff working for one to five years, five to ten years and fifteen to twenty years respectively, asking/observing a colleague had the second highest number of “very useful” responses (coming after hands-on). Staff who had been there for twenty years plus were the least likely of the six cohorts to consider asking/observing a colleague as “very useful” but, as earlier analysis shows, that cohort has a very strong preference for hands-on training.

Overall, the level of preference for asking/observing a colleague as an IT Skills training method corresponds with how useful administrative staff find it and it also corresponds with how much it was used in the previous four years.

(iii) Demonstrations/Presentations

Even though Bandura (1977) contends that vicarious learning is effective, demonstrations/presentations scored low for overall preference in Q9 which was also the case for most of the length of service cohorts from Q3. While staff with the university for less than one year gave demonstrations/presentations the same number of first preferences as asking/observing a colleague, first preferences were significantly lower among staff who had been there between one and five years and five to ten years. Among staff working in the university for between fifteen and twenty years or for twenty years plus, demonstrations/presentations also had a lower number of first preferences.

For Q6, Q7 and Q8, demonstrations/presentations were less likely to be considered “very useful” in each of the three scenarios but it is worth noting that respondents did consider them “useful” with 50% seeing them as useful for learning the basics.

(iv) How-To Guides/Videos on the University Website

The literature review highlighted the use of technology to facilitate self-directed learning but Q5 showed that relatively few respondents had used the how-to guides/videos available on the university website in the previous four years.

This lack of use was also evident in the responses to Q9 where the preference for using the how-to guides/videos was lower than the other three methods. For staff with the university for less than one year, the how-to guides/videos received the least amount of first preferences. Likewise, the number of first preference responses for the how-to guides/videos was quite low for staff with one to five years' service. Staff working with the university for between five and ten years had the highest instances of how-to guides/videos as first preference than the other five length of service cohorts. Among staff who had worked in the university for fifteen to twenty years or for twenty years plus there were no first preferences expressed by either cohort for the how-to guides and videos.

Looking at the data for Q6, Q7 and Q8, approximately 30% of the respondents for each of those questions reported that they had not used the how-to guides/videos at all. This level of non-use was higher than for the other three methods. When the researcher looked at the responses from the different subgroups, the number of respondents citing the online how-to guides/videos as "very useful" was also quite low with many responding that they had not used them at all. The researcher noted that where the how-to guides/videos are used, the figures for "most useful" or "useful" are comparable for learning the basics, learning specific tasks and refresher training.

4.2.3 Survey Summary

Overall, the researcher felt that the survey responses reflected the discussion in the literature around the importance of experiential learning (Kolb 1984, 2014) and social learning (Bandura, 1977) in the workplace. However, the responses also showed less preference for technology-enabled learning than the review of the literature would suggest. The researcher felt that the focus groups might shed some light on this discrepancy between the evidence in the literature and the lived experiences of the respondents to this survey.

4.3 Focus Group Analysis

4.3.1 Participant Details

Three focus groups were conducted on three separate days over the course of a week. There were eleven participants in total and included seven staff from Academic Affairs, three School Office staff and one Graduate School staff member. None of the participants were from the Programme Offices but that may have been due to the focus groups coinciding with a very

busy period for staff in that area. However, one of the participants had previously worked in a Programme Office so there was some insight from that area available. Participants' length of service ranged from less than one year to 20 years plus and the researcher felt that there was sufficient representation of the different length of service cohorts.

4.3.2 Collating the Data

The researcher was interested in seeing if the focus group data correlated with the literature review and the survey findings or if it would diverge. As the researcher did not want to influence the discussion, the focus groups consisted of four open-ended questions designed to get the participants to share their insights. The questions were:

1. How has previous IT Skills training gone?
2. What worked well in previous IT Skills training?
3. What didn't work in previous IT Skills training?
4. What could be done to improve future IT Skills training?

From the initial coding exercise, approximately seventeen separate themes were identified between the three groups (Appendix 9). The researcher then looked at the themes to see what could be grouped together in a meaningful way and, from that, focused on the ones that best related to the findings from the literature review and the survey data. The main themes are discussed below.

4.3.3 Theme 1: Pace and Pitch

The theme of pace and pitch of training emerged in each of the focus groups. Participants shared that the pace of some previous formal IT Skills training courses had been too fast or that the facilitator covered material too quickly when the training should have allowed more time for questions. They agreed that training works well when it is delivered at a good pace.

Participants spoke about attending previous IT Skills training that had not been pitched correctly which resulted in it being either too basic or not tailored enough to suit the needs of the learners. They felt that facilitators should understand how learners need to use a system before deciding what should be covered. This ties back to the discussion in the literature review around the use of Outcomes-Based Teaching Learning (Biggs and Tan, 2011) when designing learning interventions.

Participants also felt that expertise needed to be balanced with clear, plain English explanations and that the facilitator had a role to play here. As Participant 4 commented, it is "not just having [the] knowledge but that they [can] communicate the knowledge".

4.3.4 Theme 2: Context and Relevance

The importance of context and relevance came across very clearly in the answers given to all four questions in each focus group. As Participant 2 stated about training they had received; "if you are given [the] context you might have a better chance of remembering it."

Comments from the participants very much tie in with the assertion by Knowles (1973) that adult learners prefer to not only know what they are learning but why they are learning it and what relevance it has to their specific needs. In terms of what didn't work well, participants mentioned training that was not specific enough or not relevant to their roles or what Participant 6 termed "every day work". When considering what worked well for training, participants felt that relevance increased understanding and that training that was relevant was always useful.

4.3.5 Theme 3: Social Learning/Zone of Proximal Development (ZPD)

Social Learning, especially learning from expert colleagues, was a frequent theme and echoed the responses to the survey that very clearly favoured learning from colleagues. The literature review also emphasised the relevance of Social Learning (Bandura, 1977) and Situated Learning (Lave and Wenger, 1991) in the context of workplace learning. Participants felt that hearing other people's experiences and questions was very helpful and that group training provided an opportunity to learn from one another.

The importance of Vygotsky's ZPD and the role of the "knowledgeable other" (Kolb, 2014) was captured by the comment made by Participant 2 that having knowledgeable teammates is "very important as that is where you are getting all your training". While in more formal training, having a facilitator who knows the topic very well and at various levels is crucial.

Participants also felt that being able to ask questions saves time especially when it is just to refresh the memory about a task. This supports the results from the survey that placed asking/observing a colleague as a useful method for refresher training in IT Skills and follows on from the discussion in the literature review about the ability to learn vicariously from others (Bandura, 1977) in what Eraut (2000, 2004) calls non-formal or informal ways.

4.3.6 Theme 4: The Learning Cycle

Having the opportunity to move through the Learning Cycle (Kolb 1984, 2014) emerged as an important theme with active experimentation and concrete experience particularly crucial. Participant 6 felt having that “opportunities to practice, practice, practice” made the learning relevant. Other participants agreed that opportunities for hands-on practice, be it during training or as soon as possible back at their desk, were key to the successful transfer of learning. In fact, participants in two separate focus groups used the phrase “use it or lose it” when talking about trying out skills learned in training. The need for reflective observation also featured as participants felt that having space for reflection was important and that bite-sized and succinct refresher training was always useful. The opportunity to develop new skills allowed staff to explore the abstract conceptualisation part of the learning cycle.

4.3.7 Theme 5: Technology-Enabled Learning and Multi-Modal learning

(i) Technology-Enabled Learning

The literature review pointed to the role of technology in facilitating self-directed learning but during discussions, participants in Focus Group 1 felt that watching and listening to videos during work hours was difficult, especially where they worked in a shared office or open-plan space. They also stated that they would be unlikely to watch a video or look for information outside of work hours, preferring instead to have access to information at the point-of-need, most likely from their “knowledgeable colleagues”. Further to this, issues with videos quickly becoming outdated and lack of version management was raised in both Focus Groups 1 and 3. The limited availability of manuals or self-training opportunities for some IT Systems was also raised as a concern. This may provide some insight into the findings from the survey that consistently showed a low level of use of online how-to guides/videos.

Although the preference for using the how-to guides/videos was low in the survey, focus group participants discussed the benefits of having online training manuals and step-by-step procedures with screenshots available that could satisfy point-of need training. They also discussed how videos could be useful for certain training needs such as covering the navigation of an IT System or for refresher training. Webinars were also flagged as potentially useful where everyone has certain level of knowledge and do not need full training, but Participant 4 felt that "if something is starter level or very basic then face-to-face [is better]".

(ii) Multi-Modal Learning

Participants spoke about the benefits of having a variety of teaching methods available. They felt that attending formal training or demonstrations/presentations was good for understanding the broader context, but that hand-on training was more effective for learning specific tasks. Group training also had advantages especially where it facilitated peer-to-peer learning. Having slides and manuals available as refresher material was considered useful as were short videos. This interest in multi-modal learning can be linked back to the discussion in the literature review around the use of Universal Design principles (Rose and Meyer, 2006) to provide multiple means of accessing information particularly for point-of-need learning.

4.4 Focus Group Summary

The emphasis on context and relevance in the focus groups supports the idea that adult learners learn best when they know why they need to learn something and that it has a direct value to them (Knowles, 1973), which was something that came out strongly in the literature review. Outputs from the focus groups also support the findings from the literature review around adult learners and their preference for experiential learning and the importance of allowing learners to spend time in each part of the Learning Cycle (Kolb 1984, 2014). The preference expressed for hands-on learning in the focus groups also agreed with the findings from the survey.

The survey highlighted the importance of social learning to the staff and the focus groups demonstrated how expert colleagues can fulfil the role of Vygotsky's "more knowledgeable other" (Kolb, 2014) as discussed in the literature review. The survey results also showed a low preference for using the online how-to guides and videos available and the focus group discussions around availability and accessibility shed some light on why these methods may not have been as well-received as the literature suggested.

While the findings from the survey and the focus groups show a strong preference for hands-on learning, preferably with colleagues, there is also data from the focus groups to suggest that technology-enabled learning would be useful if it was implemented in a way that suited the needs of the learners.

The next section looks at how the findings from the research answered the research questions and makes recommendations for developing future training.

CHAPTER FIVE – CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The objective of this study was to explore how different training methods facilitate IT Skills training, with the purpose of identifying an effective blend that could be developed into a framework for delivering learning initiatives for administrative staff in an Irish university. One consideration was finding the balance between the needs of the users and limited training resources.

The main questions this study sought to answer were:

- What is an effective approach to take for providing IT Skills training to administrative university staff?
- Can technology significantly improve the efficiency of delivering IT Skills training to administrative university staff?
- What preferences do administrative university staff have for learning IT Skills?

The literature review discussed the role of experiential learning, social learning and technology-enabled learning in providing IT Skills training and the researcher explored how closely the findings from this mapped to the lived experiences of the administrative staff in the university in question. This was achieved by analysing both the quantitative data (survey) and qualitative data (focus groups) and relating the training preferences expressed by the respondents back to the literature review.

Also highlighted by the literature review was a gap in the discussion around the design and delivery of IT Skills training for administrative staff in Irish universities. This research set out to fill that gap by discussing what an effective approach to IT Skills training might look like for those administrative university staff.

The findings from the literature review, survey data and the focus group supported each other in some instances but also left some room for debate. These findings are discussed below in relation to the research questions posed earlier.

5.2 Research Questions – Discussion and Recommendations

Q1. What is an effective approach to take for providing IT Skills training to administrative university staff?

The literature does not show a clear preference for solely online or face-to-face delivery for workplace learning and recent writing on the subject, such as Hart (2018), supports the use of a range of formats that learners can use as required. Further to this, the 70:20:10 model (Lombardo and Eichinger, 1996) mentioned earlier suggests that successful workplace learning is a blend of learning through experience, learning from others and formal learning. Studies by Huang, Lin and Huang (2012) and Angolia and Pagliari (2016) show how using a blended approach is effective for delivering IT Skills training and the focus group participants indicated that they appreciate having a variety of IT Skills training methods available. The findings from the survey and focus groups emphasise that what works well is IT Skills training that is fit for purpose and tailored to the needs of the learners. As the needs of learners vary, so should the training that is on offer.

A key factor for the administrative staff is access to IT Skills training that is pitched appropriately and is relevant to their needs. Findings suggest that they lean towards on-the-job training as it gives them a control over the pace, timing and content of their learning that can be lacking in more formal offerings. It also allows for questions and knowledge sharing among colleagues. Given this preference for social learning with peers, the researcher believes that harnessing the skills of the "expert colleagues" to facilitate local training is something that should be explored as part of the proposed training framework. This could also help address the issue of limited training resources.

Formal training also has a role to play as it could help staff understand the wider context of how an IT System is used and lay the groundwork for more specific training. Focus group participants felt that, especially in group settings, formal training could prove effective by allowing staff to gain expert guidance while providing an opportunity to learn from the experiences of others.

Although the survey and focus groups highlighted the benefits of hands-on training and learning from peers, there was also a recognition that demonstrations/presentations and online how-to guides/videos could be effective in certain instances. The focus groups felt that demonstration/presentations could provide a good overview of an IT System while step-by-step online how-to guides/videos could be a useful resource for self-directed learning or refresher training.

Based on the findings from the research, the researcher believes that using a blended approach to deliver IT Skills training to the administrative staff could be effective once the methods used are matched to the learners' needs and the desired training outcomes. The following recommendations suggest how this might be achieved.

Recommendations: The use of Universal Design for Learning principles (Rose and Meyer, 2006) could facilitate a blended approach to training. The strengths of the different training methods could be harnessed to produce an integrated framework that facilitates both general and point-of-need training. As part of the design process, having learning outcomes that are constructively aligned to the content (Biggs and Tang, 2011) could ensure that the material is relevant to the needs of the administrative staff and help them understand the purpose of the training. A train the trainer approach could be used to develop the facilitation skills of a group of "expert colleagues" who could then provide local training and promote best practice among the staff. The preference for social learning could be leveraged to create communities of practice that foster knowledge sharing between the administrative staff.

Q2. Can technology significantly improve the efficiency of delivering IT Skills training to the administrative university staff?

The benefits of using technology in the design of learning was documented in the literature review. However, the survey results showed a low preference for using online how-to guides/videos and the focus groups indicated that this might stem from a lack of relevant material being available and, more notably, a preference for getting point-of-need knowledge directly from colleagues.

On the other hand, the focus groups did identify instances where technology could benefit IT Skills training such as covering the navigation of an IT System via a live demonstration or screen capture video. Responses from the survey and the focus groups, indicate that demonstrations/presentations are considered useful for providing context and covering the basics. Based on this, the researcher believes that live demonstrations could provide an efficient way to introduce a significant number of the administrative staff to the new IT System in a short space of time and acquaint users with the necessary basic skills and functions. This could be integrated into a wider framework of training.

The literature review, survey and focus groups all agreed that both experiential learning and social learning are effective IT Skills training methods. One way that technology might efficiently combine these two methods is through group learning in a PC Lab environment where learners could use the IT System to carry out real-life tasks and learn with and from

each other. This also supports the adult learner's need for seeing the relevance in what they are learning.

Participants also suggested that a video library of relevant and succinct training courses might address time-pressures around learning. This could also facilitate movement around the Learning Cycle (Kolb, 1984, 2014) by offering chances for reflective observation.

While the reported uptake of technology-enabled learning was low overall, the researcher believes that this can be addressed by using technology in a targeted manner to improve the overall efficiency of the IT Skills training. The following recommendations suggest how this might be achieved.

Recommendations: Integrate technology into the training design in a way that suits the needs of the learners, such as short videos that deliver bite-sized learning at the point-of-need. This could be especially effective for refresher training. Using a PC Lab for group training could provide an opportunity to deliver synchronous, hands-on training that satisfies the strong preference shown for authentic, experiential learning and facilitates social learning with immediate feedback. This could also address time and resource pressures while still meeting the needs of the users.

Q3. What preferences do administrative university staff have for learning IT Skills?

The literature review highlighted how experiential learning, social learning and technology-enabled learning can facilitate IT Skills training and the survey data showed a strong preference for experiential learning and social learning among the administrative staff. Discussions in the focus groups stressed the usefulness of training that provided opportunities to practice and ask questions of colleagues. The use of technology-enabled learning was less popular, but the focus groups indicated that it may have been due to lack of availability as much as lack of interest.

The survey asked respondents about preferences for learning the basics, learning specifics and refresher training and the focus groups highlighted the importance of training being pitched at the appropriate level for the learner's needs. Focus group participants felt that different training methods suited some training needs better than others. For example, hands-on learning and asking/observing a colleague were favoured methods for learning a specific task but there was data to support the use of technology in the right circumstances especially as an introduction to a new IT System or for refresher training. The focus groups cited online step-by-step guides with screenshots and short videos as examples of how technology-enabled learning can be used effectively to enhance training. There is a case for providing a

blend of training opportunities that meets the needs of the users while making the best use of the limited training resources and time available.

Recommendations: Design training that meets the needs of the learner and accounts for prior learning. Providing opportunities for practice should aid transfer of learning and allow staff to move around the learning cycle. Improved availability of technology-enabled learning could help deliver training in bite-sized chunks.

5.3 Proposed Training Framework

The literature suggests that a blended approach to workplace learning is effective and the primary research shows that while experiential learning and social learning are strongly preferred methods by the administrative staff there can be a role for technology-enabled learning if it is integrated correctly.

Based on the findings of the study and the recommendations made, the following IT Skills Training framework is proposed. It follows the spectrum of training needs; basic, specific and refresher/point-of-need, and integrates experiential learning, social learning and technology-enabled learning to provide a multi-modal, blended approach to training in the new IT System. Many of the training methods can be used in each part of the spectrum but consideration should be given to the prior knowledge of the learners and the pitch, pace and content should be adapted accordingly for each level.

The intention of the framework, shown on the next page, is to provide training that meets the needs of the users while maximising the available time and limited training resources.

Introduction/Basics Training Methods	Specific Tasks Training Methods	Refresher/Point-of-Need Training Methods
Live Demonstrations/ Presentations **Facilitates:** social learning, face-to-face learning, technology-enabled learning, ZPD	**Classroom Based, Hands-On Training in test system** **Facilitates:** social learning, face-to-face learning, experiential learning, ZPD, formal learning	**One-to-One, Hands-On Training with an "Expert Colleague" in live system** **Facilitates:** social learning, face-to-face learning, experiential learning, ZPD, non-formal learning
Classroom Based, Hands-On Training in test system **Facilitates:** social learning, face-to-face learning, experiential learning, ZPD, formal learning	**One-to-One, Hands-On Training with an "Expert Colleague" in live system** **Facilitates:** social learning, face-to-face learning, experiential learning, ZPD, non-formal learning	**Ask/Observe a Colleague** **Facilitates:** social learning, face-to-face learning, vicarious learning, ZPD, informal learning
Ask/Observe a Colleague **Facilitates:** social learning, face-to-face learning, vicarious learning, ZPD, informal learning	**Ask/Observe a Colleague** **Facilitates:** social learning, face-to-face learning, vicarious learning, ZPD, informal learning	**Step-by-Step Online Guides** **Facilitates:** technology-enabled/online learning, self-directed learning
Step-by-Step Online Guides **Facilitates:** technology-enabled/online learning, self-directed learning	**Step-by-Step Online Guides** **Facilitates:** technology-enabled/online learning, self-directed learning	**Short Videos/Webinars** **Facilitates:** technology-enabled/online learning, self-directed learning
Short Videos **Facilitates:** technology-enabled/online learning, self-directed learning	**Short Videos** **Facilitates:** technology-enabled/online learning, self-directed learning	**Communities of Practice** **Facilitates:** social learning, vicarious learning, self-directed learning, informal learning

5.4 Suggestions for Further Research

The findings from the primary research agreed with the review of the literature around the benefits of experiential learning and social learning however they were less definitive about the role of technology-enabled learning. While the survey responses showed that the available online how-to guides/videos were considered less useful than the other methods, the focus groups uncovered examples of how technology-enabled learning could be useful for IT Skills training. These diverging messages suggest the need for a closer look at the effective use of technology for delivering IT Skills training to the administrative staff. Further investigation is needed to establish if there is simply a lack of interest among the administrative staff in using technology-enabled learning or if it is falling short of the expectations of the users.

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APPENDIX 1 Ethical Approval Granted

ETHICS COMMITTEE Approval - 14th December 2018

Student Name: Caroline McTeigue

Student Number: 2959689

Supervisor: Peter Gillis

On review of your amended ethics submission The Master of Arts in Training and Education (MATE) *Faculty Ethics Committee (FEC) has approved this proposed study you may proceed, and a final copy of ethics should be submitted to peter.gillis@griffith.ie for records.

Peter Gillis
Dissertation Module Lead

APPENDIX 2 Participant Information Sheet

My name is Caroline McTeigue, I am currently undertaking a dissertation for a Master of Arts in Training and Education with Griffith College Dublin.

The aim of this study is to identify an effective learning design that will meet the needs of administrative staff who require training in a new IT system. The objective is to compare and contrast how technology-enabled learning and face-to-face interventions facilitate learning, with the purpose of identifying an effective blend that can be developed into a framework for delivering staff learning initiatives.

You have been invited to take part in this research because you are an administrative staff member who uses IT Systems such as Banner.

The research will be conducted in two phases. In phase one you will be asked to complete an anonymous short survey (that should take no more than 10 minutes) relating to your experiences of training and development in relation to the IT Systems. Phase two will involve the use of focus groups (approximately five to ten people per group) to further explore the themes that emerge from the survey and to discuss different training interventions. The focus groups should last between 90 minutes and two hours and will be audio recorded to assist with note taking. You can volunteer to participate in a focus group via a link to a separate form at the end of the survey. You will be under no obligation to participate in both phases.

Separate consent forms will be provided for both phases of the research. All information you share will be treated with the utmost confidentiality and your comments/contributions will be anonymised. Data will be stored securely on the researcher's laptop and a backup USB memory stick. Both will be encrypted. Data will only be retained until the degree has been awarded.

The benefit of this research is that it can be used to inform the design of a training framework that meets the learning needs of the staff while satisfying the institution's need to provide efficient and effective training. This research fills a gap as it focuses on learning and development for administrative university staff and explores the use of blended learning to meet their training needs. There are no risks associated with participating in the study.

Your participation in either phase is entirely voluntary, and you are under no obligation to take part in this inquiry. Furthermore, if you wish to withdraw from the study at any point prior to the analysis phase of the research please feel free to do so.

If you have any questions regarding this research project, please contact the researcher at (01) XXX XXXX or email: caroline.mcteigue@xxx.ie

APPENDIX 3 Informed Consent Forms

(i) Survey Consent Form

The aim of this study is to identify an effective learning design that will meet the needs of administrative staff who will require training in a new IT System.

Consent to take part in research

I have read the participant information sheet and have had time to consider whether to take part in this study. I understand that my participation is voluntary (it is my choice) and that I am free to withdraw from the research at any time without disadvantage. I agree to take part in this research.

- I understand that, as part of this research project I will be asked to answer survey questions relating to my experiences with training and development in IT Systems such as Banner.
- I understand that my name will not be identified and that all survey data will be gathered anonymously.
- I understand that the data may be used to inform the design of training for future IT Systems.
- I agree that the data can be used in the publication of a Masters dissertation.

◯ I consent

◯ I do not consent

(ii) Focus Group Consent Form

The aim of this study is to identify an effective use of blended learning that will enhance learning for administrative staff who will require training in a new IT System.

Consent to take part in research

I have read this information sheet and have had time to consider whether to take part in this study. I understand that my participation is voluntary (it is my choice) and that I am free to withdraw from the research at any time without disadvantage. I agree to take part in this research.

- I understand that, as part of this research project I will be asked to participate in a focus group with my peers to further explore the themes that emerge from an earlier survey and to discuss different training interventions.
- I agree to the focus group being audio and recorded for the purposes of transcription.
- I understand that all information I share will be treated with the utmost confidentiality and my comments/contributions will be anonymised both in terms of my name, and the area I work in.
- I understand that the data may be used to inform the design of training for future IT Systems.
- I agree that the data can be used in the publication of a Masters dissertation.

Name of Participant (in block letters):

_____

Signature: _____ Date: _____

If you have any questions regarding your treatment or rights as a participant in this research project, please contact Caroline McTeigue at (01) XXX XXXX or contact them by email: caroline.mcteigue@xxx.ie

APPENDIX 4 Survey Questions

2 What area do you work in?

- ◯ Programme Office
- ◯ School Office
- ◯ Graduate School
- ◯ Academic Affairs (Registry, UCD International etc.)

3 How long have you worked in UCD?

- ◯ Less than 1 year
- ◯ 1 to 5 years
- ◯ 5 to 10 years
- ◯ 10 to 15 years
- ◯ 15 to 20 years
- ◯ 20+ years

4 How often do you use the following IT Systems?

	Daily	2 to 3 times a week	2 to 3 times a month	At key times of the year	Never
Banner	◯	◯	◯	◯	◯
InfoHub	◯	◯	◯	◯	◯
Gradebook	◯	◯	◯	◯	◯
Curriculum Management	◯	◯	◯	◯	◯

5 In the past four years, what type of training have you had in the following IT Systems? (Tick all that apply)

	Planned hands-on training with Registry	Hands-on training from a colleague	Demonstrations/ Presentations	Asked/Observed a colleague	'How to' guides/videos on Registry website	None of these
Banner	☐	☐	☐	☐	☐	☐
InfoHub	☐	☐	☐	☐	☐	☐
Gradebook	☐	☐	☐	☐	☐	☐
Curriculum Management	☐	☐	☐	☐	☐	☐

6 For the IT Systems you use, how useful have you found the following training methods for learning the basics?

	Very Useful	Useful	Neutral	Not Useful	Have not used
Hands-on training	○	○	○	○	○
Demonstrations/ Presentations	○	○	○	○	○
Asking/Observing a colleague	○	○	○	○	○
'How to' guides/videos on the website	○	○	○	○	○

7 For the IT Systems you use, how useful have you found the following training methods for learning specific tasks?

	Very Useful	Useful	Neutral	Not Useful	Have not used
Hands-on training	○	○	○	○	○
Demonstrations/ Presentations	○	○	○	○	○
Asking/Observing a colleague	○	○	○	○	○
'How to' guides/videos on the website	○	○	○	○	○

8 For the IT Systems you use, how useful have you found the following training methods for refreshing your memory about a particular task?

	Very Useful	Useful	Neutral	Not Useful	Have not used
Hands-on training	○	○	○	○	○
Demonstration/ Presentations	○	○	○	○	○
Asking/Observing a colleague	○	○	○	○	○
'How to' guides/videos on the website	○	○	○	○	○

9 For learning IT Skills, please rank the following training methods in order of preference.
1 = most preferred and 4 = least preferred

⠿ ▲▼ Hands-on training

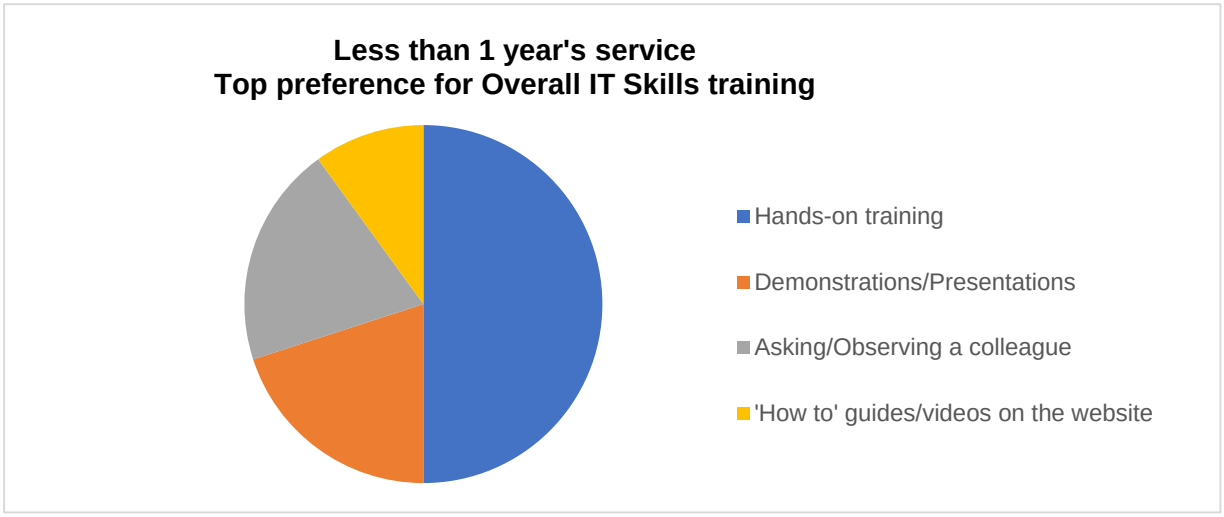
⠿ ▲▼ Demonstrations/Presentations

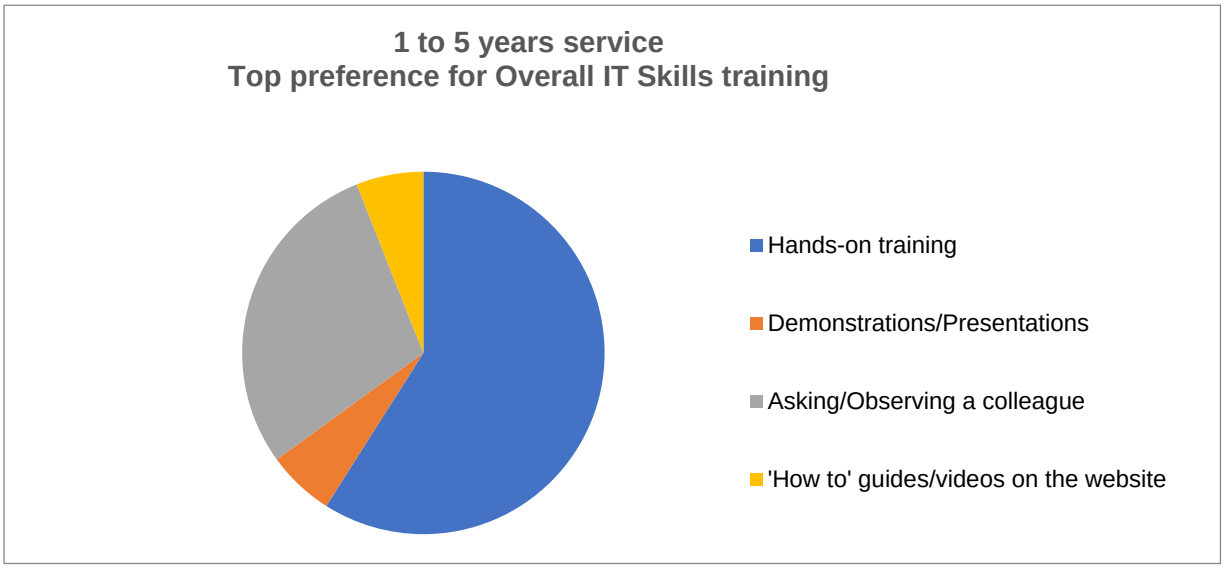
⠿ ▲▼ Ask/Observe a colleague

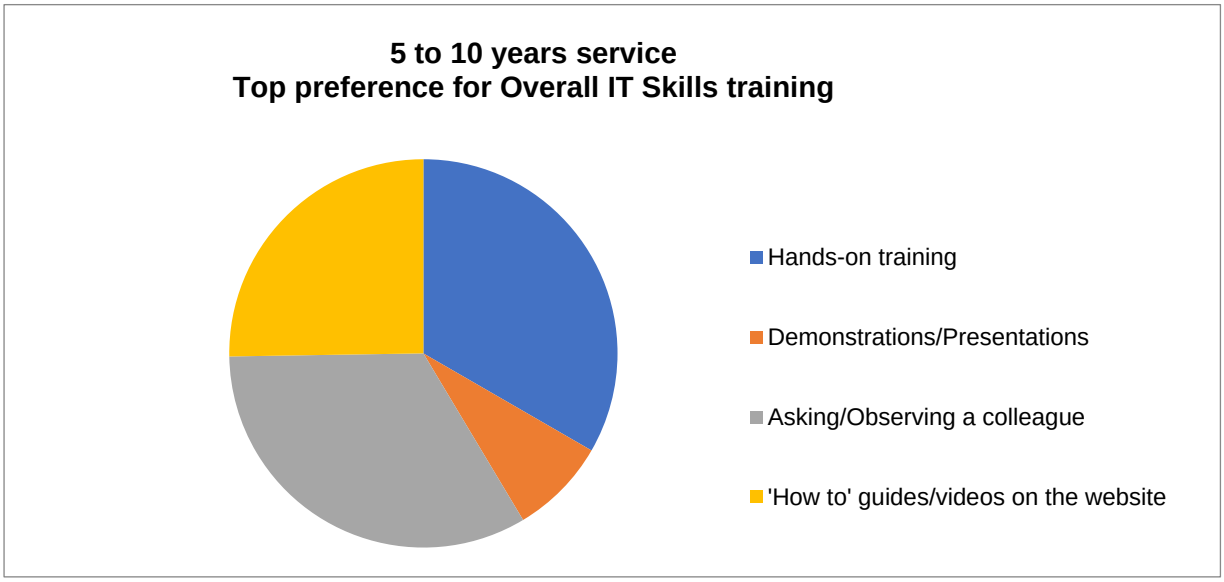
⠿ ▲▼ 'How to' guides/videos

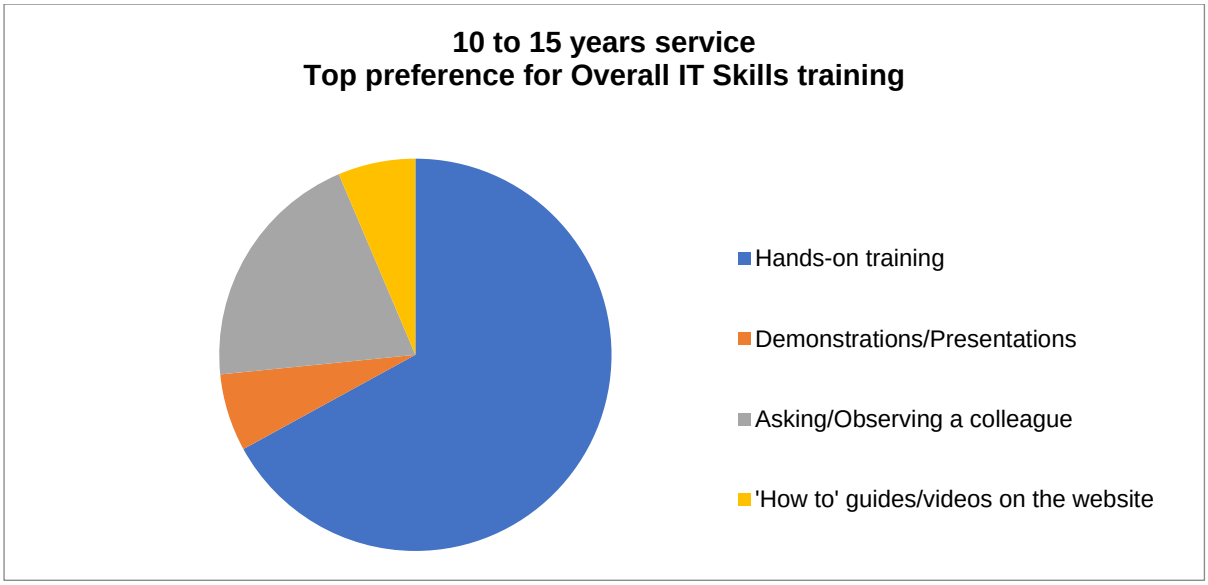
APPENDIX 5 Graphs for Top Preferences for Overall IT Skills - by Subgroup

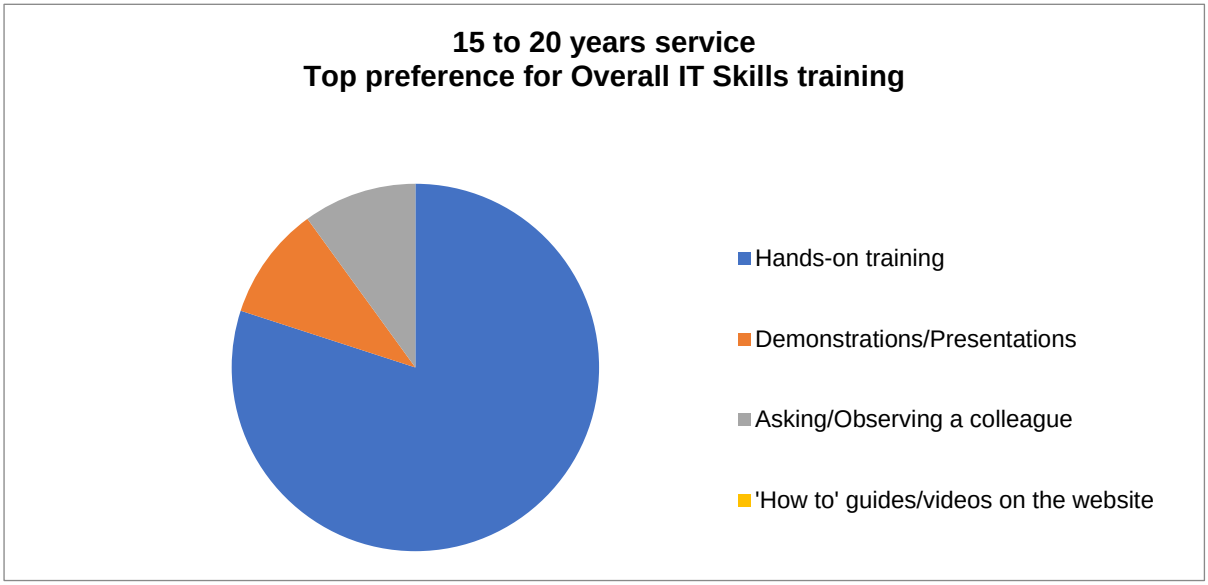
(i) Length of Service Cohorts

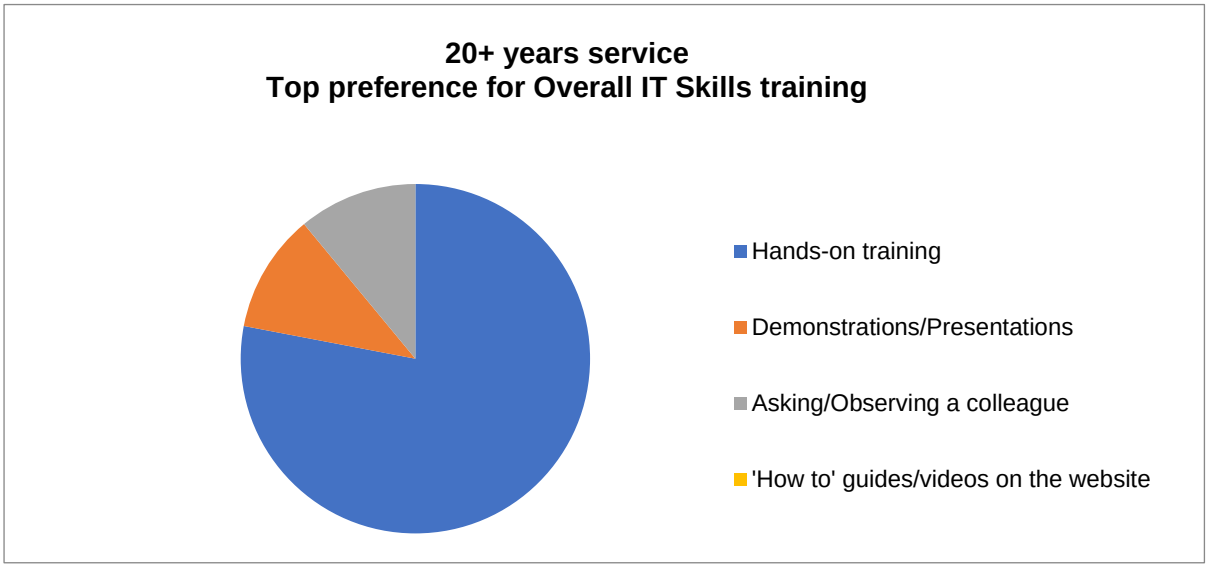




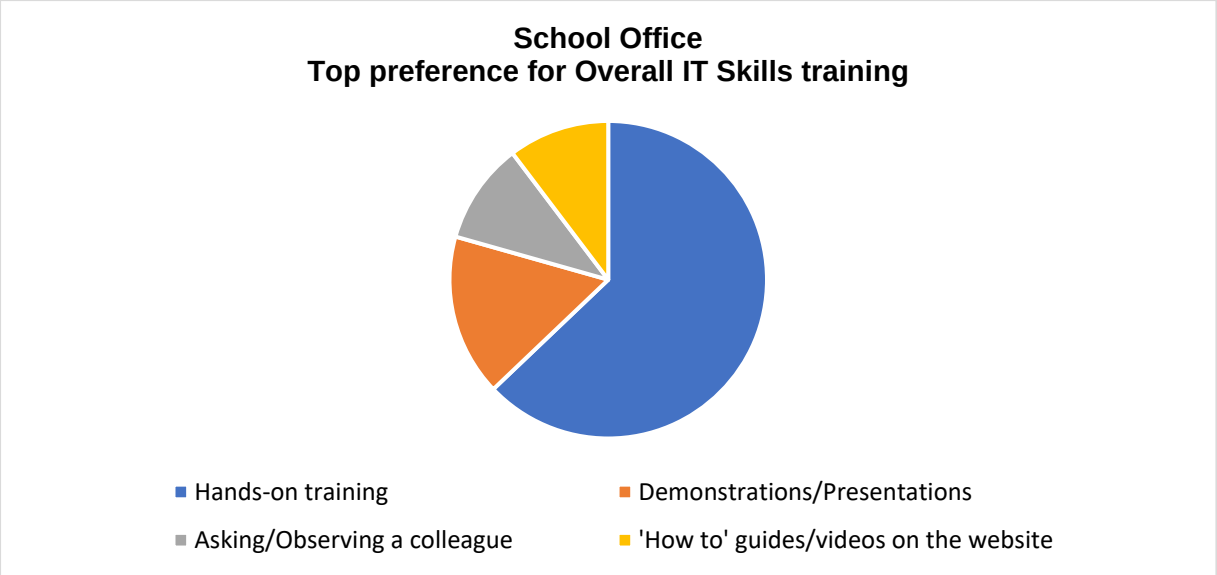


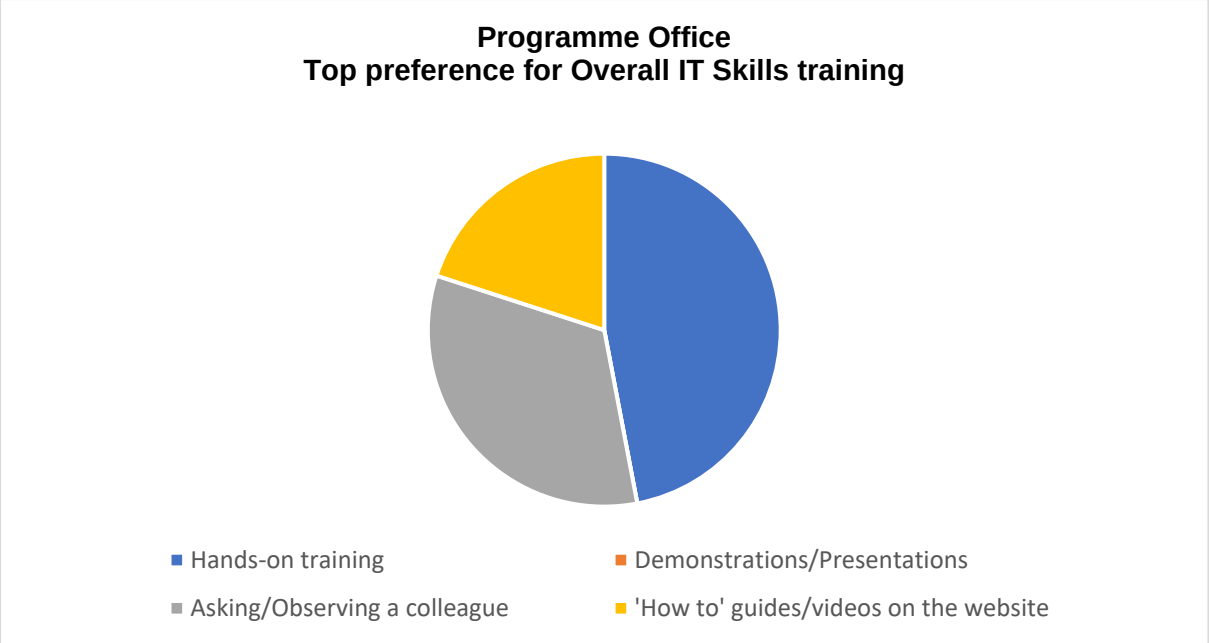

10 to 15 years service
Top preference for Overall IT Skills training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

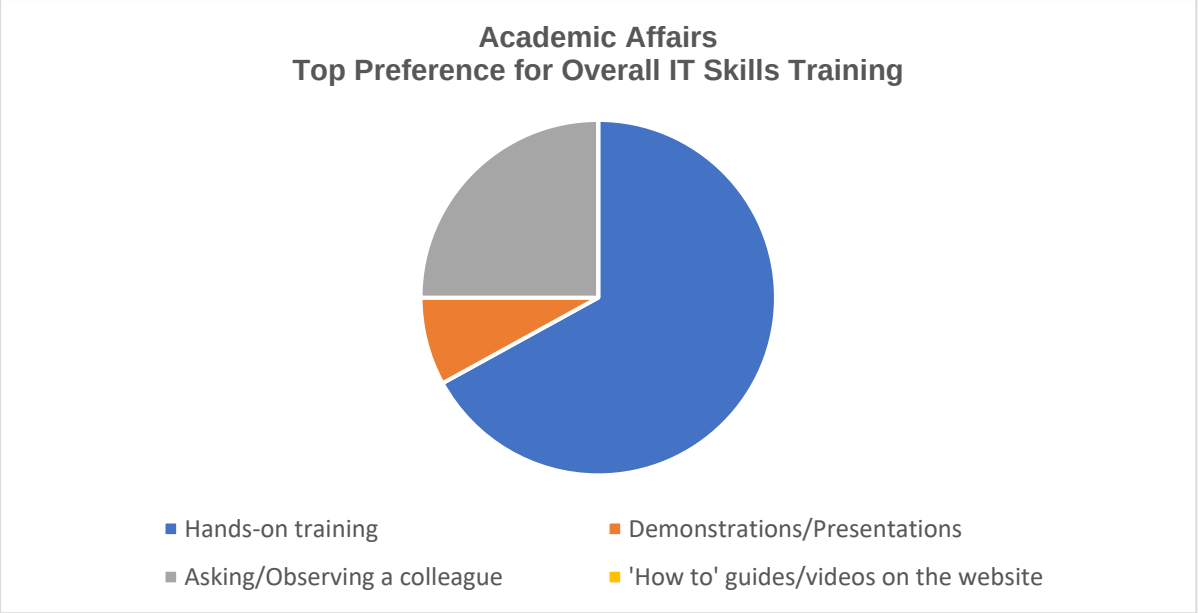

15 to 20 years service
Top preference for Overall IT Skills training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

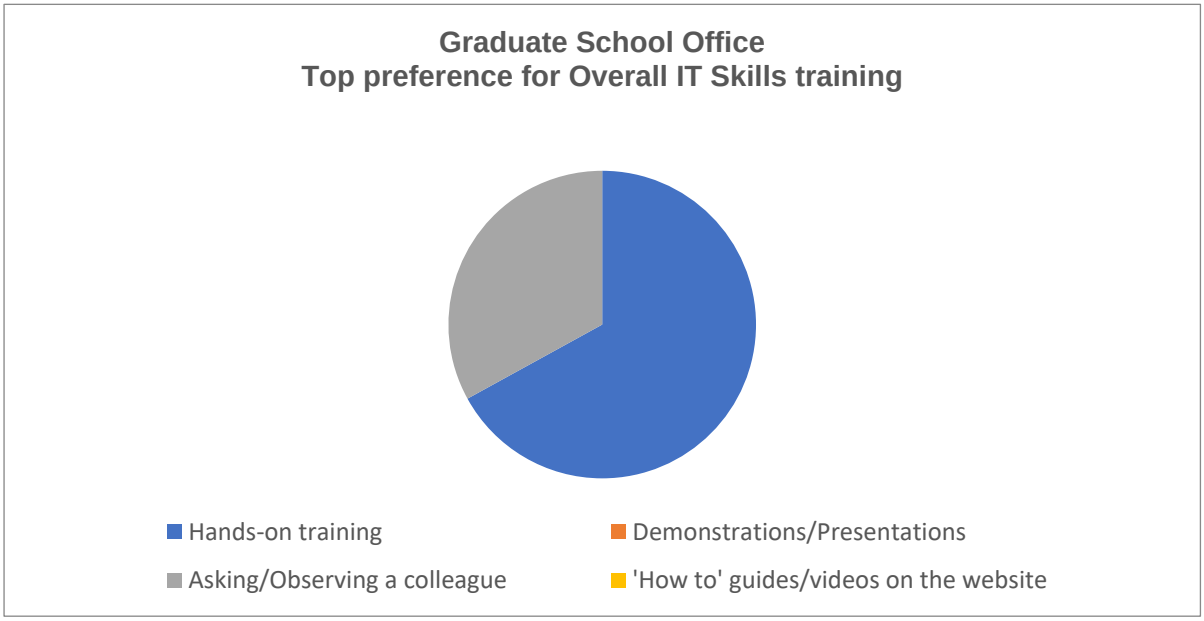

20+ years service
Top preference for Overall IT Skills training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

(ii) Area of Work Cohorts

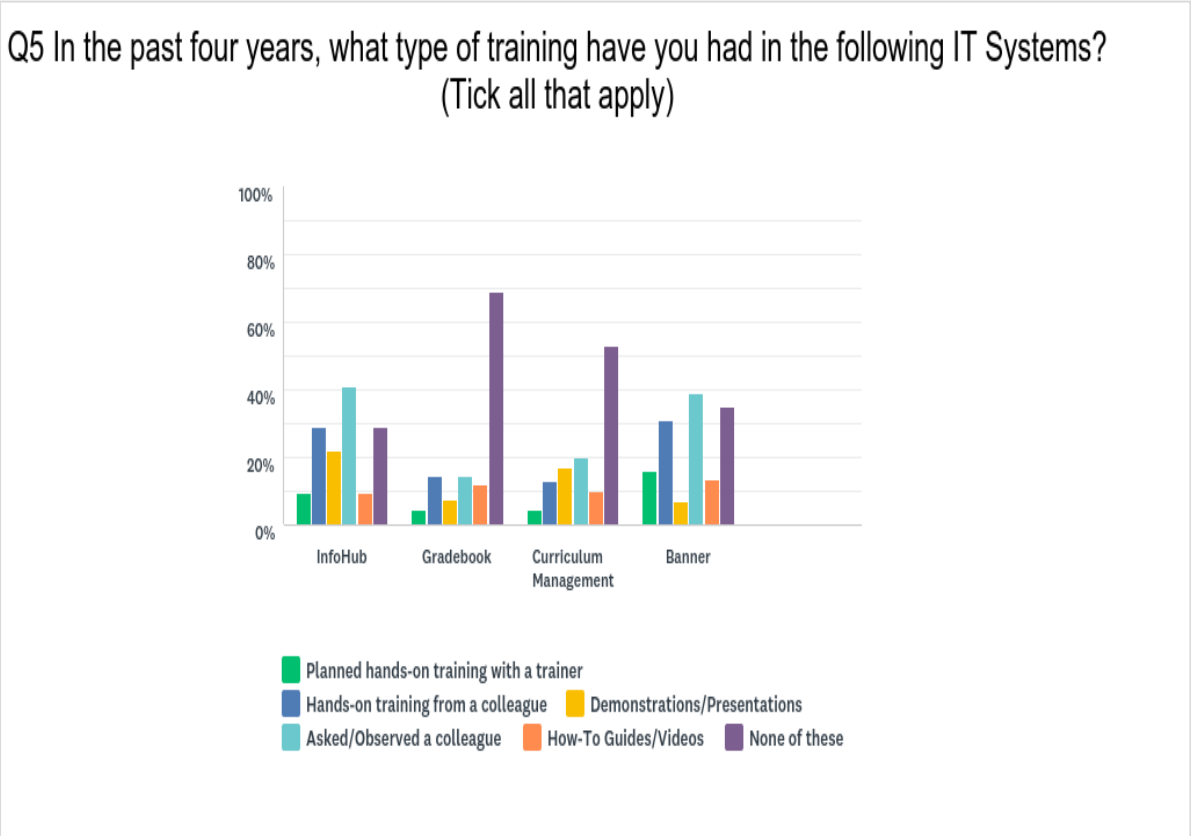





Academic Affairs
Top Preference for Overall IT Skills Training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

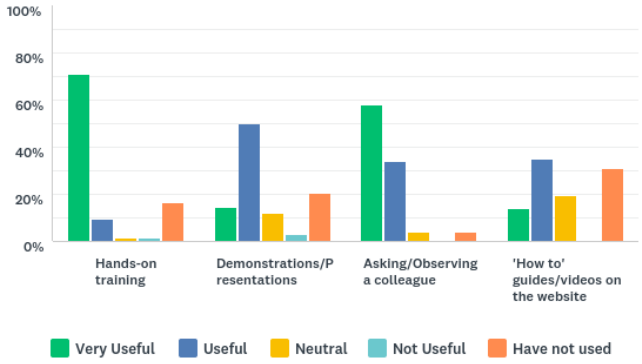

Graduate School Office
Top preference for Overall IT Skills training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

APPENDIX 6 Graph for Survey Question 5

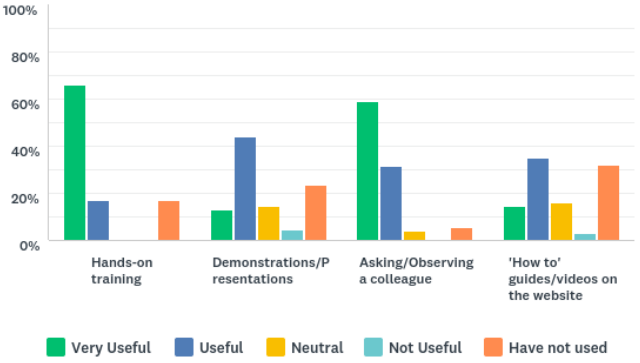


APPENDIX 7 Graphs for Survey Questions 6, 7 and 8

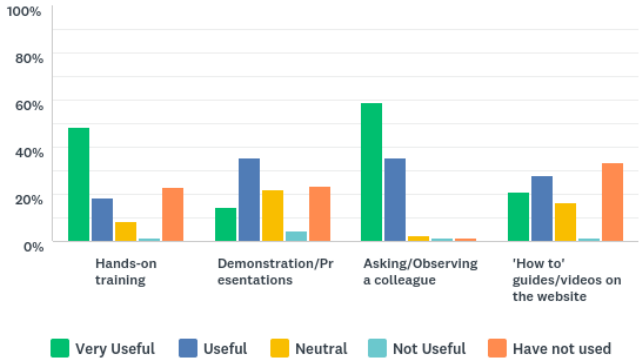
Q6 For the IT Systems you use, how useful have you found the following training methods for learning the basics?



Q7 For the IT Systems you use, how useful have you found the following training methods for learning specific tasks?

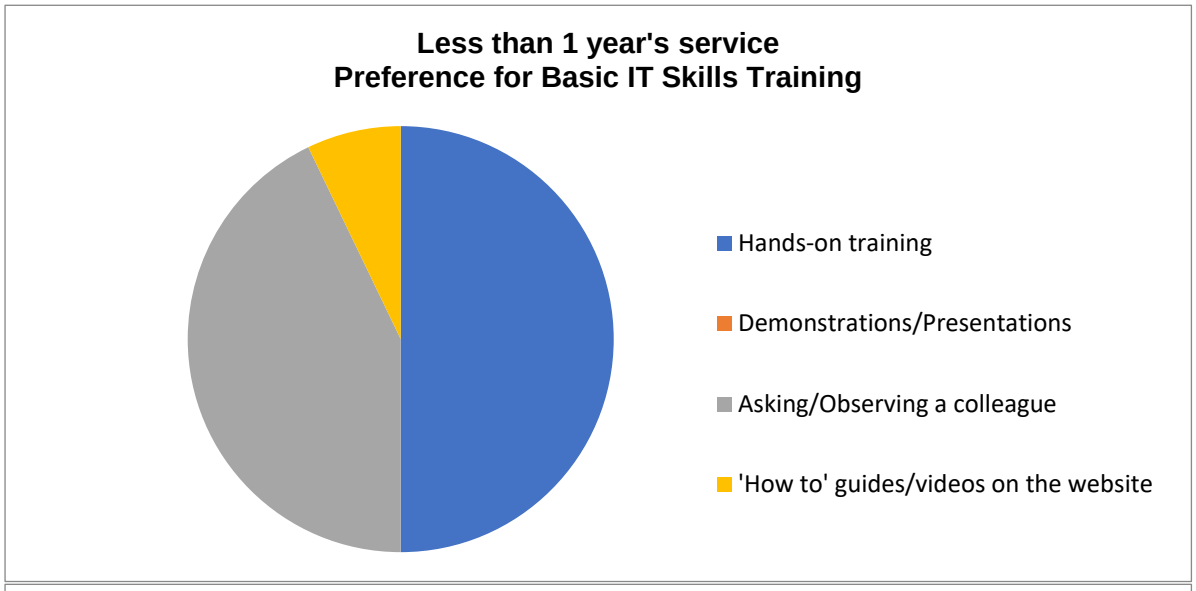


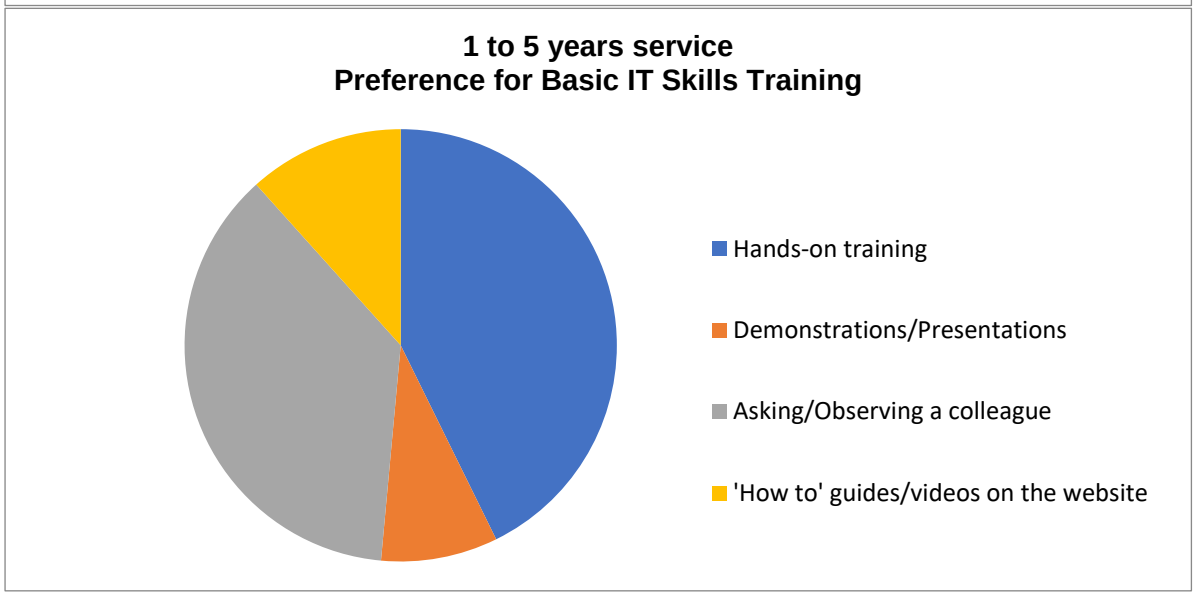
Q8 For the IT Systems you use, how useful have you found the following training methods for refreshing your memory about a particular task?

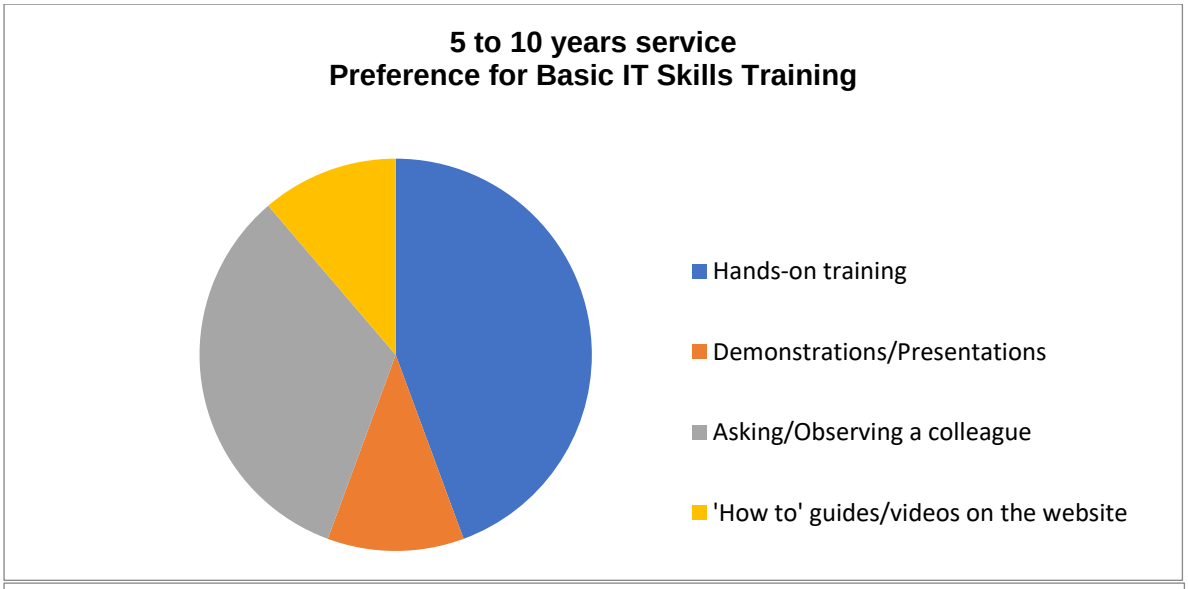


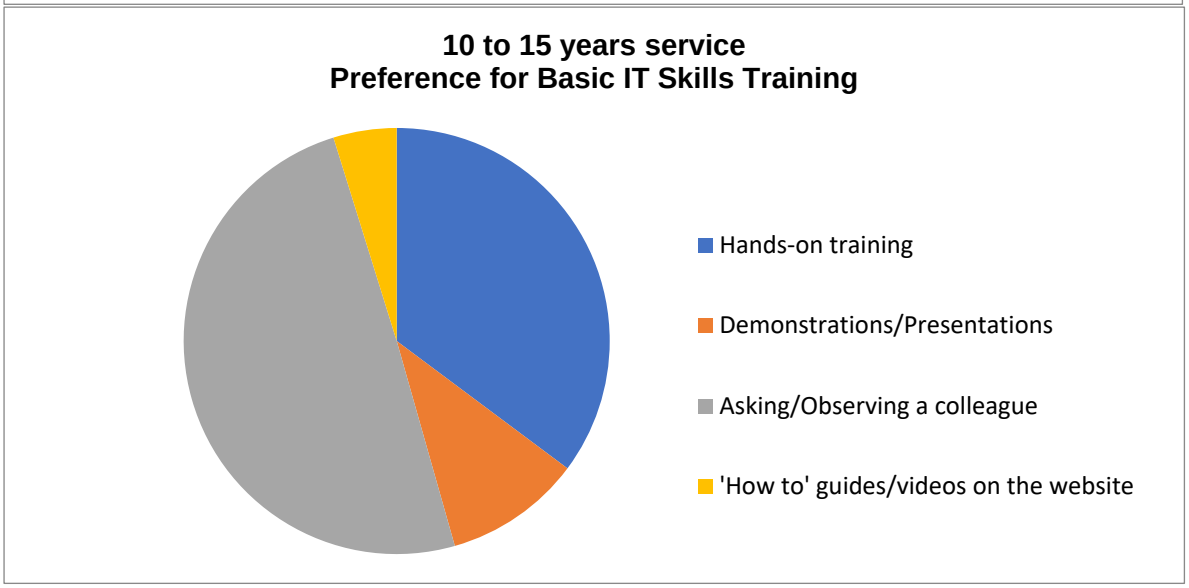
APPENDIX 8 Preferences for Learning the Basics – by Subgroup

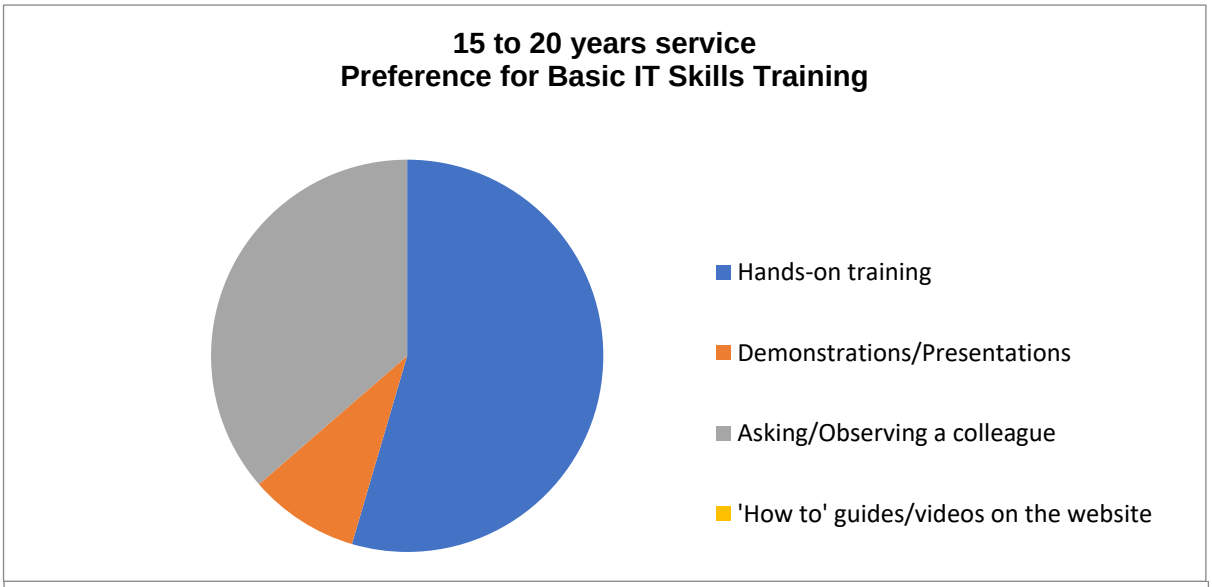
(i) Length of Service

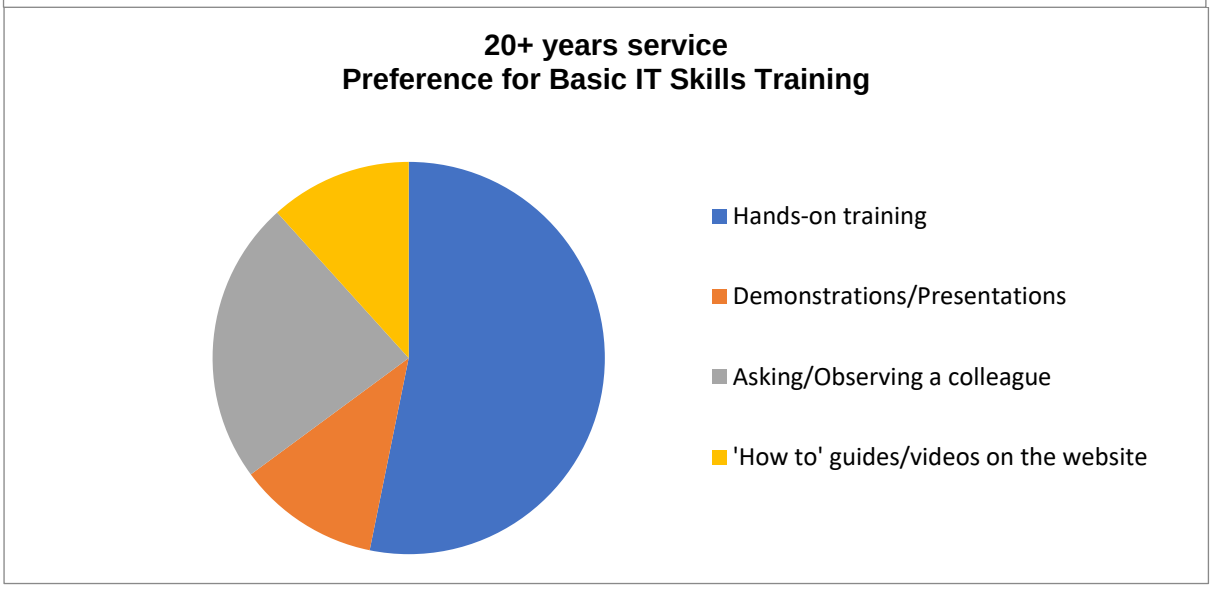




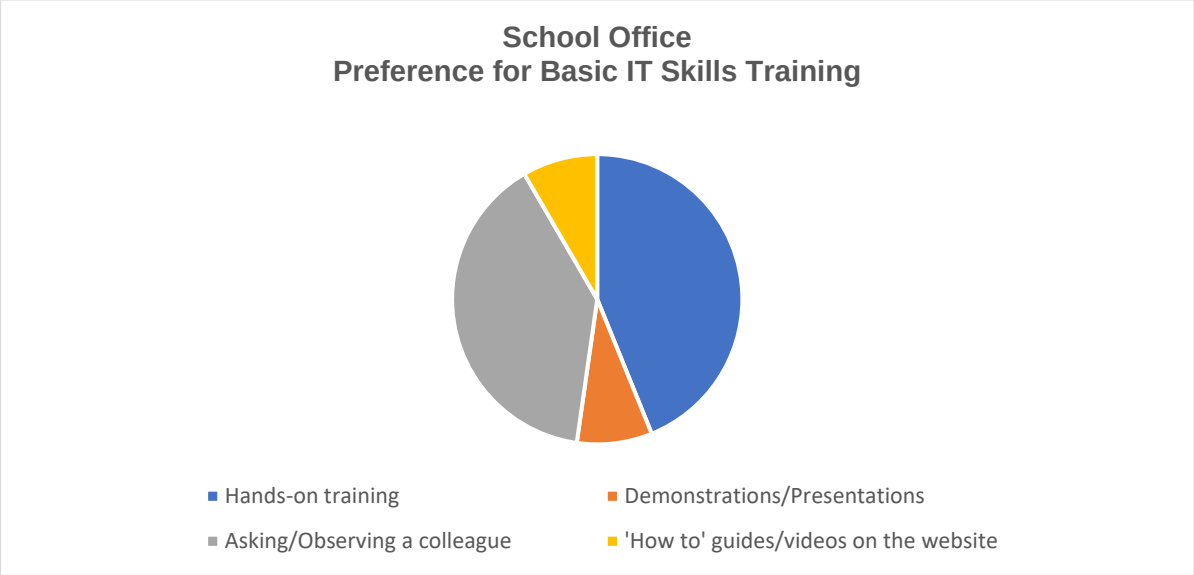

5 to 10 years service
Preference for Basic IT Skills Training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

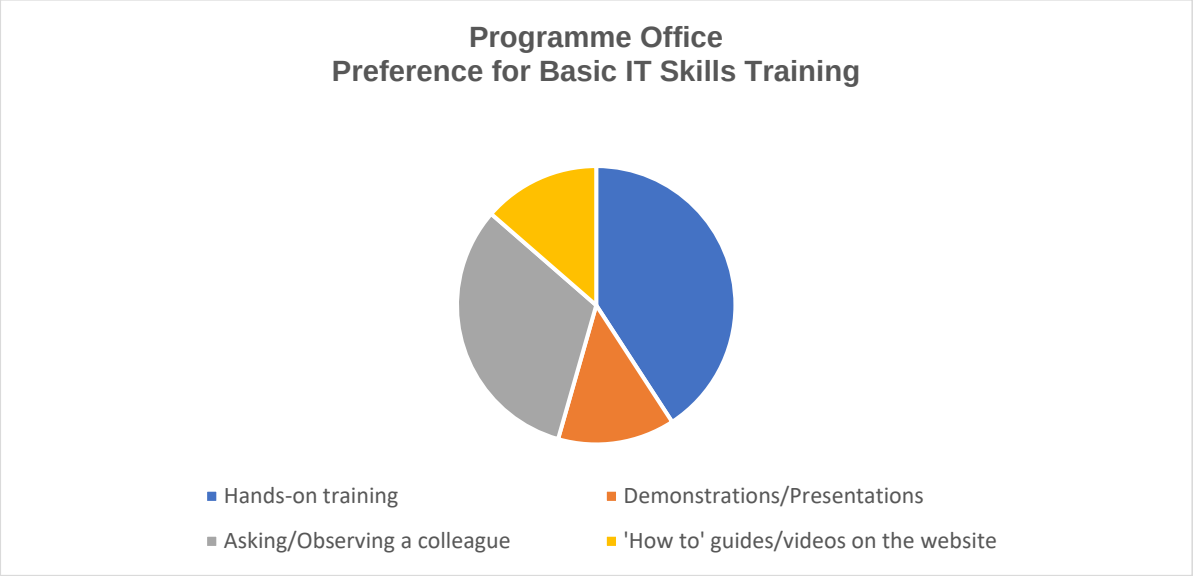

10 to 15 years service
Preference for Basic IT Skills Training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

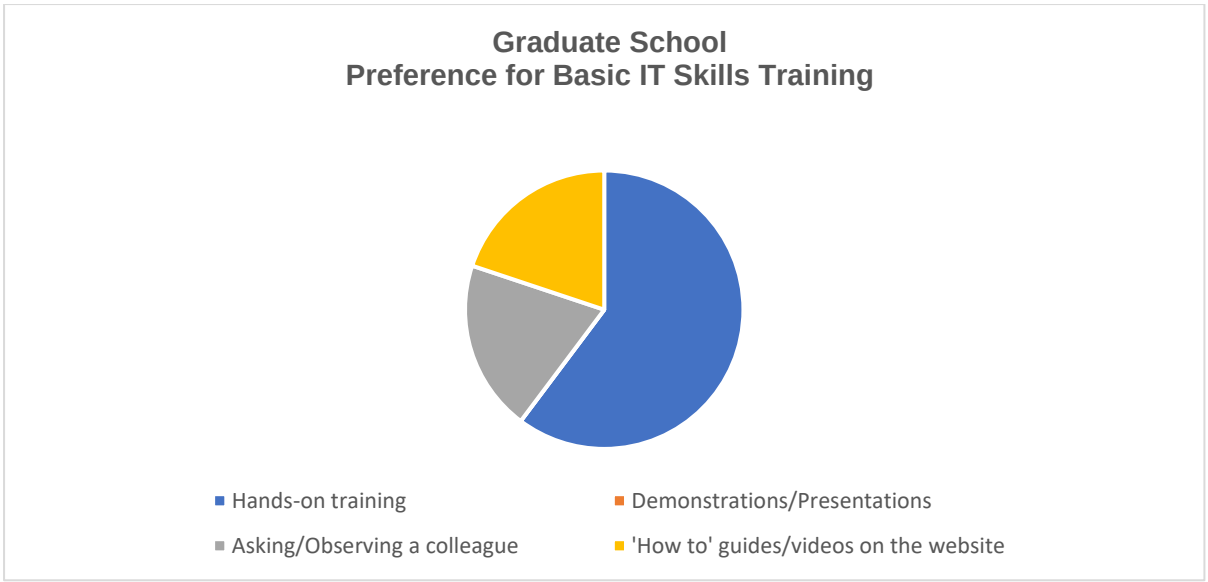

15 to 20 years service
Preference for Basic IT Skills Training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

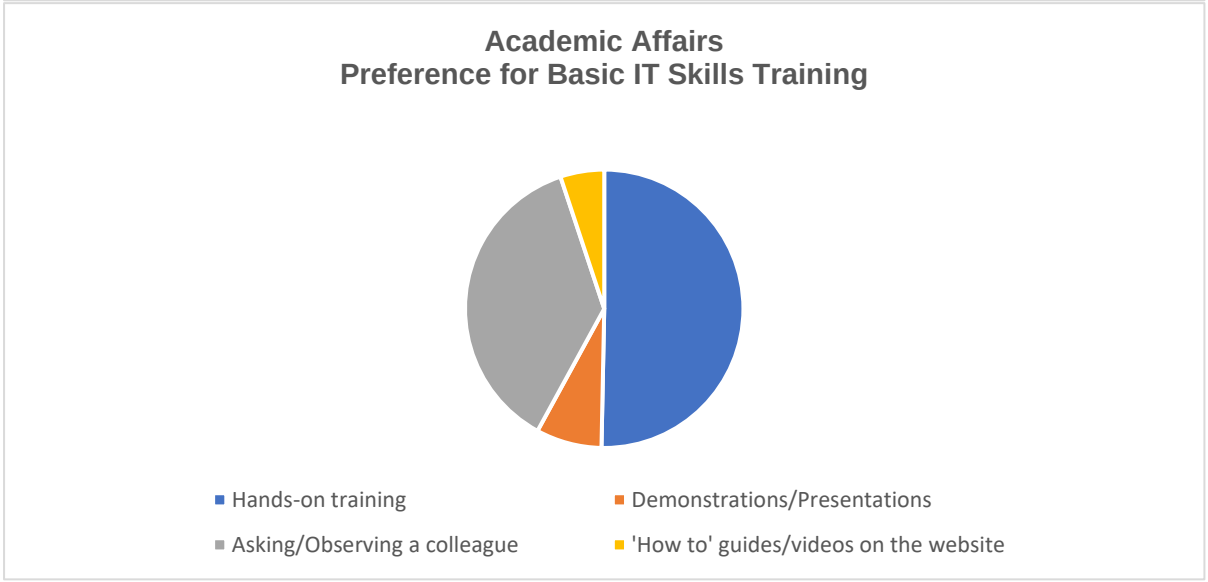

20+ years service
Preference for Basic IT Skills Training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

(ii) Area of Work






Graduate School
Preference for Basic IT Skills Training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website


Academic Affairs
Preference for Basic IT Skills Training
Hands-on training
Demonstrations/Presentations
Asking/Observing a colleague
'How to' guides/videos on the website

APPENDIX 9 Focus Groups Thematic Coding

Q1 How has past IT training gone?	Q2 What worked well in previous IT training?	Q3 What didn't work in previous IT training?	Q4 What could improve future IT training?
Context	Context	Availability of training	Context
Delivery method	Facilitator	Context	Delivery method
Facilitator	Learning Cycle – abstract conceptualisation	Delivery method	Facilitator
Learning Cycle – concrete experience	Learning Cycle – active experimentation	Facilitator	Learning Cycle – concrete experience
Learning is relevant	Learning Cycle – concrete experience	Learning Cycle – active experimentation	Learning is relevant
Multi-modal	Learning Cycle – reflective observation	Learning Cycle – concrete experience	Multi-modal
Pace	Learning is relevant	Learning Cycle – reflective observation	Pitch
Pitch	Multi-modal	Learning is relevant	Self-directed learning
Self-directed learning	Pace	Pace	Social Learning/ Situated Learning
Self-efficacy	Pitch	Pitch	Technology-enabled
Social Learning/ Situated Learning	Self-directed learning	Self-directed learning	ZPD/more knowledgeable other
Transfer of training/learning	Social Learning/ Situated Learning	Transfer of training/learning	
ZPD/more knowledgeable other	Technology-enabled	ZPD/more knowledgeable other	
	Transfer of training/learning		
	ZPD/more knowledgeable other		