The S.T.E.P procedure in corporate training environments:
An investigation in how design and presentation facilitates learning

A dissertation submitted for the MSc in Education

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September 2009

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Abstract

Instructional designers, instructors, e-Learning professionals and other stakeholders who have an interest in the way online courses are to be designed and built have very little research evidence to inform their work. While scholarly research has revealed some suggestions about what constitutes good design, the way these ideas can be implemented in practice is still lacking. E-learning designers require a clearer blueprint of good design. This study investigates whether the way online learning/training is presented can facilitate learning, and if it can, how. Specifically, the research explores whether the design and presentation using the self-created STEP procedure will be beneficial to the learner in terms of improving the learning experience and facilitating learning outcomes in a corporate setting. STEP is an acronym for Show (the tutorial), Try (allowing learners to apply what they have just learned), Evaluate (assessing their understanding instantly) and Pass (assuring the learner that they have passed the competencies). The STEP procedure was built to try to address some of the current deficiencies that exist in online courses today that have been identified in the literature and is also based on the recommendations and suggestions by experts in the field.

The researcher employed a mixed, but mainly qualitative, approach in data collection, where the participants were asked to take a pretest to assess their understanding of the basics of Office 2007 prior to the online training. Participants were then asked to complete a short web-based questionnaire. Participants then participated in the online training in Office 2007 using the STEP procedure. Upon completion, the learners then participated in a post-survey and a post test, and a sample participated in a semi-structured interview where additional information was collected about their learning experience and reactions towards the STEP procedure.

The study found that most participants feel positive about their overall learning experience when using the STEP procedure in learning. There was a significant increase in their scores from the pretest to the post-test. The study also explored the difficulties and perceptions faced by learners in both online and face-to-face environments, and looked at their thoughts, ideas and concerns about the STEP procedure. The STEP procedure was received very well by the participants and the research indicates that the STEP procedure has great potential for future development and design in e-Learning.

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Chapter 1: Introduction

Fisher (2007)states that there are two approaches to academic research. One is structured and the other is unstructured. Structured research is defined as research in which one imposes a structure on the research based on preliminary theory, concept or hypothesis. An unstructured enquiry, on the other hand, exists when one sees what concepts and frameworks emerge from the study. As the title of the dissertation suggests, this study follows a preliminary theory, which is a design and delivery concept in e-Learning (herein referred to as the STEP procedure), conceived by the researcher with the intentions of trying out his concept on learners. This study took place in July 2009 at SCICOM's training academy in Petaling Jaya, Malaysia.

The purpose of this dissertation is to explore the learners' perspectives of online learning in a corporate setting. Specifically, the researcher seeks to explore learners' perceptions of learning online, introduce the self-created STEP procedure to learners, and study their reactions.

Specifically, the study aims to:

i) Explore the difficulties faced by learners in the online training they have taken previously.

ii) Investigate their thoughts, ideas or concerns on the new design and presentation of an online learning module designed and developed using the STEP procedure.

iii) Study the effect of the STEP procedure in terms of learning gains and reactions to the module.

1.1 Structure of the dissertation

Following this chapter, in which the researcher states the purpose of this paper, the remaining chapters are arranged as follows:

Chapter 2 presents the literature review where the issues of online learning are discussed. This chapter attempts to justify the reason for this research to be carried out and the reason the researcher designed and developed the STEP procedure.

Chapter 3 describes the methodology and research methods employed in this study. Ethical considerations are also discussed in accordance with the guidelines and practices set by professional associations such as the British Sociological Association (BSA), the Social Research Association (SRA) and Central University Research Ethics Committee (CUREC).

Chapter 4 presents the findings of the study from the pre- and post-surveys and the interviews. The findings are summarized, along with tables and charts.

Chapter 5 provides a discussion and in-depth analysis of the data presented in chapter four. The limitations of the study are also included in this chapter.

Chapter 6 is the conclusion, highlighting the key findings from this study.

Chapter 2: Literature Review

2.1 E-Learning - Why is e-Learning in the corporate setting important?

Dun and Bradstreet, in their 1996 report estimates that corporations and government spend $40 billion annually on training, and a growing percentage of that amount is through online/web-based training. Koprowski (2000) estimates the amount of money U.S. companies spent on the web based learning grew from $3 billion in 1999 to $11 billion in 2003. Corporations have realized that web based training allows training to reach a larger number of audience in a cost effective manner. They have recognized the importance of knowledge based learning for their employees as Bates (2005) echo the need for corporations to train employees to become more competitive without the high cost of travel and time away from work, for example, IBM reported that for every 1000 employees that use web learning, the company saved $500,000 in travel costs alone (Kiser, 1999). Reduced training costs and world-wide accessibility, have made electronic instructional delivery a viable option for many corporations. (Brown, 2000; Barron, 1999; Beer, 2000; Wells, 1999). A survey done in 2000 by Fortune magazine found that 20% of the $66 billion allocated for training was used for web based training and this will increase by 40% in 2003. (Gotschall, 2000)

Corporations understand the huge advantages of moving their training online. Strother (2002) further states, 'In addition to generally positive economic benefits, other advantages such as convenience, standardized delivery, self-paced learning, and variety of available content, have made e-learning a high priority for many corporations.' The CEO of Cisco, John Chambers said that e-Learning will be the internet's next 'killer' application. Once an online course is built, it can reach all their employees or intended learners throughout the world. One such case is Baxter International, a healthcare organization where the researcher recently developed an e-Learning program that reaches over 55,000 of its employees worldwide. The immediate cost savings for this effort was well over $2 million dollars as the need for sending out their employees to third party training centers for similar training was eliminated by building their own in-house web based modules. The cost for reaching per employee was only USD$2. Rosenberg (2001) states that businesses need to get the ever changing information across to people and reduce the overall costs and the question today is not if an organization decides to embark on e-Learning but rather how well they do it. The corporate sector values e-Learning and sees it as a valuable knowledge management tool for its organization and are building e-Learning in house as they want to transform themselves and become a learning organization (Bates, 2005). Scicom Academy (a subsidiary of Scicom International) where the field work was conducted is an example of an organization transforming itself by creating a training arm to complement and enhance its core business. Meyen et. al. (2002) projects that online offerings in the corporate sector will continue to increase significantly in the years to come.

2.2 The difficulties for e-learning in the corporate setting?

Meyen et. al (2002) has identified that the problem today is that a systematic approach to researching the pedagogy of online instruction, interface designs, the framing of constructs and the application of e-learning has not evolved to where it should be. In the corporate setting, typically a trainer who has little knowledge in designing, developing and delivery of courses, is usually given the responsibility of developing learning strategies for the web. Even when a fully qualified instructional designer and e-

Learning expert is brought into the corporate sector as a professional consultant to develop e-Learning programs, the lack of research in this field makes the design and development stage of building an e learning module a trial and error basis. 'Learning and training are often thought of as synonymous; they are not. Training is the way information is conveyed; it supports learning, which is our internal way of processing information into knowledge. But since there are many ways we can learn, an effective learning strategy must transcend learning.' (Rosenberg, 2000).

In the seventies and early eighties, a tremendous amount of effort was put into the development of e-learning, commonly known as computer-based training (CBT). One of the causes for the disappointing progress of CBT at those times was the technical barriers that existed in those days. Computers in the early days were limited in its processing speed and CD drives were nonexistent. Thus, CBTs were limited to the memory size of floppy diskettes. A rapid change in technology also caused many of the CBT programs developed to become obsolete by the time the CBT is developed and reaches the marketplace. Rosenberg (2000) also added that another major problem was that many programs were dull, as they consisted mainly of text and poorly written questions. He further states that many of the learning programs are poorly designed and ineffective. In the nineties, CBTs transformed and improved with introduction of images and videos along with text after the web, CD drives along with PCs with greater processing power were introduced, and this enabled developers to embed animations and videos to the CBTs.

However, according to Bligh (2000) in Stephenson (2001), the rise of new technologies has caused a crisis in traditional education as students who just listen and take notes, as done traditionally, now see the traditional technique as not being effective at all. With the introduction of PowerPoint and its wide accessibility and usage, many see this as an opportunity to use this medium to convert traditional instructor led courses directly into PowerPoint slides, and consider it fit for the web as an e-learning module. Instructors and corporate trainers became instant instructional and e-Learning developers overnight and as Govindasamy (2002) puts it, forced to become content experts, instructional designers, graphic artists, media producers, programmers and instructors. As a result, these individuals have no clear blue print of what constitutes a good design and delivery method for e-Learning in the corporate environment. Even instructional designers are constantly trying to find effective ways to design e-learning which can support learning (Beer, 2000; Mayer and Moreno, 2003)

Fink (2003) in Rovai (2004), writes that 'faculty knowledge about course design is the most significant bottleneck to better teaching and learning in higher education' (pp. 23–24). Rovai (2004) went on to further state that 'accordingly, it is important that online faculty have a solid understanding of the major principles of online course design before they attempt to put a course together. Extensive preplanning of online courses is essential. Clark and Mayer (2002) state that it is a common error to design each new medium to mirror older ones, for example, some e-lessons appear to be books transferred to the screen. These are some of the obvious problems learners have with current online/web based courses available in the market today. When knowledge in design and presentation is lacking, this leads to what Jona (2000) calls online courses as fancy 'page turners', which are simply online versions of lecture notes, facts, and concepts that the learner progresses through sequentially. Many online courses run into the danger of becoming what Savenye, et al, (2001) states, which is if an existing course is simply modified by putting the course materials onto a Web site, and discussion software added, it is likely that the course will simply be a correspondence course with email added. This is the state of e-Learning modules for many corporations

Schmidt (2005) states that corporations must provide context aware delivery methods because a learner in the corporate environment is not primarily into learning but usually working and that they interrupt their work in order to undertake learning. He further states that current learning methods are suitable for long term learning and not learning on demand, as required for a busy corporate employee. Harasim et al, (1995), in Stephenson (2001) make the argument that online learning is more than lectures being delivered online in the form of text, audio and/or video. The authors go on to further state that there is a danger when conventional lectures are simply reproduced using the new media (e.g., online, web, electronic) and that it is critical for designers to provide activities that engage students while allowing students to make sense of the content. Thus, the STEP procedure that is the focus of this dissertation and is described in section 2.3, is built around the notion that learning should be continuously engaging to the learners through the use of video, simulations and quizzes and built around a framework that will work in a corporate setting.

2.3 The STEP Procedure

"No one ever learned to ride a bike, play ball, or fix a flat tire by sitting through a lecture on it. We all learned these things by actually trying to do them, making mistakes, getting confused, asking questions, and trying again until we got it right. This, in essence, is how natural human learning takes place" (Jona, 2000).

The STEP procedure is a style of presentation and delivery of e-learning modules. The style and presentation were formed from an idea the researcher came up with based on his experience with teaching students in face-to-face, blended learning and online courses. In 2008, the researcher was called to design, develop and deliver learning to over 55,000 employees for a client based in Chicago, USA with offices around the world. The courses using the STEP procedure were finally put into use and received good responses from learners; however, no further research was undertaken to study its effect on learning and on the learner until now.

Diagram 1.0 is a screenshot of an actual online training in Office 2007 using the STEP procedure that was used for this research. This was a standalone online tutorial, teaching students the basics of Office 2007. The videos contain audio and were kept under three minutes each. The lengths of the videos are indicated in the brackets, as seen in the diagram below. The videos are an animated screen capture with a series of instructions on how to use a feature within Office 2007, broken down by different modules. The students would first watch the instructional video, and then proceed to try the simulations and finally, attempt the overview quiz. The simulations enable- the learners to practice the new skills acquired by observing the videos. The overview quiz would then test their knowledge in the subject and assign them a score. The STEP process encourages what is known as cumulative learning, where each learning component builds upon itself. This is in-line with the cumulative learning model where a learner learns an ordered set of capabilities which build upon each other in a progressive fashion through differentiation, recall and transfer of learning (Gagne, 1968).

All the simulations were guided simulations, meaning that if they got lost or confused, or simply did not know the answer while attempting the simulations, the correct answer would be revealed after two attempts. Savenye et. al, (2001) suggest that most instructional design models include iterative stages of evaluation and revision, as opposed to evaluating instruction only after implemented. This type of ongoing evaluation during development is called formative evaluation. The STEP procedure was

designed to include simulations and an overview quiz as a form of formative evaluation for the learner. The goal of the simulations was to emphasize the application of course concepts to the students' real-world situations (Ackerman, 1996; Carly & Palmquist; 1992; Duffy & Jonassen, 1993; Harasim, 1997; Moore & Kearsley, 1996; and Sponder, 1990 in Lynch, 2001). Constructivist theorists believe that learners learn best when they can contextualize what they learn for immediate application and acquire personal meaning (Ally, 2004). The STEP procedure follows these theories very closely. The learners are able to immediately apply what they have learned through the guided simulations and by using the self-check, they can acquire personal meaning to whether they have truly understood the learning objectives of the course. This is a form of self-evaluation that will work very well in a corporate e-Learning environment where an instructor or trainer is not available.

Show Video Tutorials	Try Simulations	Evaluate Self-Checks	Pass Mastery

Video	Simulation	Self-Check (Test your skills)
Introduction [00:36]		
Ribbon [01:06]		
Office Button/Quick Access TB [01:28]	Quick Access Toolbar	
Help Icon [01:16]	Help Icon	
Ribbon Groups and Tool Tip [01:41]		
Live Preview and Zoom [01:20]		
Status Bar [01:35]		
Open XML [01:36]		
Preparing a Document [02:38]	Preparing a Document	
Galleries and Themes [01:20]		
	Overview	
	Tools Overview	Overview Quiz

Diagram 1.0: The STEP Training in Office 2007

The STEP procedure also builds on Kolb's learning cycle as seen in diagram 2.0. Each stage shown below is a process within the STEP procedure. While it does contain all four of Kolb's stages, Kolb does not include the evaluation stage, where it is at this critical stage, especially in an online setting where an instructor is not present, the learner is able to self determine if learning did in fact occur.
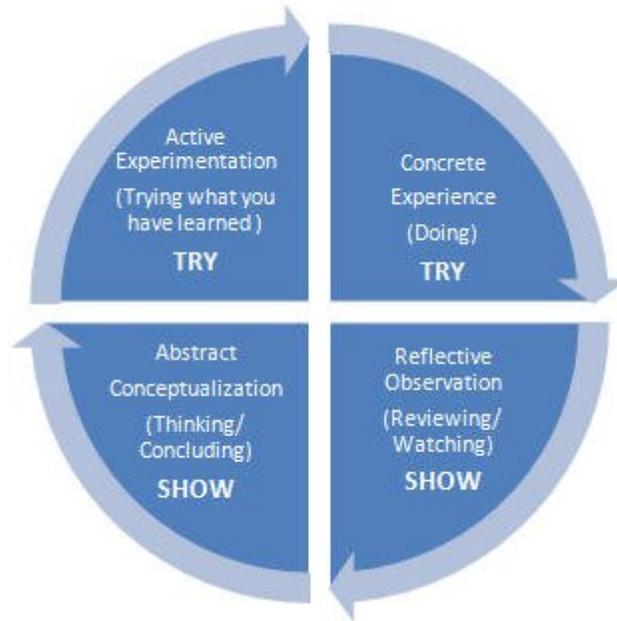
Diagram 2.0: Kolb's learning cycle (adapted from Kolb 1984, p.33)

In an online setting, the abstract conceptualization stage can only re-occur after learners are evaluated or receive some form of feedback about their learning. Wagner (1994) defines feedback as a way for learners to judge the quality of his or her performance. When a leaner receives feedback, the learner can then reflect upon one's own thinking and thereby monitor and manage their learning. Should they not perform well in either the simulation or the quiz, they have a choice to go back and manage their learning by watching the videos again or reattempting the guided simulations. Greeno et. al in Berliner & Calfee (1996) identifies this process as a metacognitive process and the STEP procedure incorporates this process in its design of courses.

2.4 Why the STEP procedure may address some of the difficulties

The literature review has revealed that little has been researched on the actual design and presentation of e-Learning and its role in pedagogical gain. Studies typically relate to e-learning tools and how each tool itself relates to known pedagogies. Studies have also shown strategies regarding why one should implement e-Learning and rarely the design and presentation aspects of it. When frameworks are discussed, the discussion tends to lead to software and technologies used to build e-Learning along with the various platforms recommended. Schramm (1977), in Anderson (2004), suggests that learning is influenced more by the content and instructional strategy in the learning materials than by the type of technology used to deliver instruction. Since human computer interaction is a relatively new field, design and presentation methods are rarely discussed in a scholarly manner when relating to pedagogical gains.

Piaget's constructivist theory suggests that learners do not copy or absorb knowledge, but they are developed through active experimentation (Mayes and Frietas, 2004). In a nutshell, Piaget suggests that learning takes place when students seek information as opposed to teachers standing in front of a classroom and trying to get students to memorize experts' knowledge. The STEP procedure demands

that a learner control one's own learning, through its iterative learning style built within its design. Piaget says that the process of seeking information is through problem-solving activities and feedback. The STEP procedure is designed around the notion that students must be very involved in their own learning and incorporates problem solving activities through the use of the guided simulations, when designed.. The simulations and the overview quiz provide a score and this score serves as a feedback mechanism to the learner. This form of feedback is extremely crucial for corporate learners as an instructor or trainer is not available to provide them with any feedback. This allows the learner to learn through the metacognitive process.

Rovai (2002), in Anderson (2004), mentions that the delivery medium is not the determining factor in the quality of learning per se; rather, course design determines the effectiveness of the learning. Clark (1983), in Anderson (2004), makes a claim that technologies are merely vehicles to deliver online training and do not influence learning; however, he states that it is the instructional strategies that are built into the learning materials. The STEP procedure is a procedure or a process that allows future development in e-learning to focus on quality, design and delivery methods that can possibly serve as a blueprint for stakeholders. The design, presentation and delivery are the instructional strategy within the STEP procedure and it is believed to be an effective learning mechanism that can enhance learning in a corporate environment. According to Cole (2000) in Anderson (2004), learning materials must be designed properly to engage the learner and promote learning. Siemens (2004), in Anderson (2004), says that a theory is necessary in this digital age to guide the development of materials for the networked world. This research will study the design of e-Learning using the STEP procedure on learners. Should learners find it conducive for their learning, the STEP procedure can be considered as a theory for future development of e-Learning.

According to Rosenberg (2000), training in general has four main elements, which are enhancing performance, a good instructional design strategy, the media by which the instruction is delivered and in some situations, a measurement strategy. The STEP procedure contains all four of these elements in its design, delivery and presentation. Zhang and Nunamaker (2003) suggest an easy-to-use and user-friendly interface as a very important feature in e-learning. They further state that video-based learning environments have indicated that students find video materials compelling. William et al. (1992) in Zhang and Nunamaker (2003) further suggests that information or knowledge of experts can be represented in the form of videos. Videos along with audio are a powerful way of presenting knowledge and this is the very first stage of the STEP procedure.

Baylor (2000) has identified cognitive training strategies and their possible roles for technology. These strategies include interactivity, learning in smaller chunks, giving working memory a break, and varying the information. In interactivity, the author recommends learner control, which allows the learners to guide themselves through the training according to their own pace and schedule. Secondly, the use of simulations allows the user to experiment with reality in a controlled and engaging environment. Finally, through feedback because learners are more open to accepting feedback from computers than from a person. As for training in smaller chunks, researchers suggest brief computer-based modules accessible on an as-needed basis (Baddeley, 1986; Baylor, 2000; Miller, 1956). Szul and Woodland (2008), in Neuhauser (2004), find that the use of multimedia can facilitate learning. Research shows that audio

actually has more positive impact on learning than video. Clark and Mayer (2006) believe that cognitive theory and research evidence recommend that e-learning include words and graphics, rather than words alone. This is part of active learning, in which learners can learn by association. The STEP procedure contains these elements where active learning can take place. The videos are an animated sequence of instructional steps, teaching the students the new features of Office 2007. It includes audio that guides the e-lecture. These videos are kept short (under three minutes) as recommended by Baylor (2000), Baddeley (1986) and Miller (1956), as students learn better by receiving information in smaller learning chunks. The interactivity portion is through the simulations that follow these video. The simulations are guided, therefore in a controlled environment. Each stage of the STEP procedure builds upon itself and the learners progress in a systematic manner.

Kirkpatrick (1996) states that the reason for evaluation in training is to determine the effectiveness of a training program. The STEP procedure follows a design that closely reflects Kirkpatrick's four levels, which are Level 1: Reaction, Level 2: Learning, Level 3: Behaviour, Level 4: Results. Each of these four levels is reflected in the style and presentation of the STEP procedure. Level 1, which symbolizes 'hear', is the first part of the STEP procedure, which is to see and hear the video presented (as the video contains an audio track). The second and third level 'do' are similar to the STEP procedure, 'try' after seeing and hearing a learning component. It also tries to adjust learners' behavior by making sure they become more familiar with the concept of what they have just been taught. Level 4 tests their 'productivity' to determine if there has been an effect on their skills, it is tested using the 'evaluate' process in the STEP procedure. Finally the 'pass' part of the STEP procedure means that if all the previous steps were followed, learners should be able to pass and master the learning component.

Meyen et.al (2002) argues that the delivery element of online instruction is the methodology of e-learning and this is the most important pedagogy for e-learning. The authors further state that we have been pre-occupied trying to meet the needs of the learners and as a result the content structure remains unchanged. An example of this is in order to allow interaction between a learner and the instructor, some online courses may decide to embed instant messaging (IM) to the course. However, this is not changing the course structure in terms of delivery and design. The course remains unchanged but now just has a new added feature, as Lehtinen (2003) in De Corte et. al (2003) argues that pedagogical approaches used are more important than the technical features of the applied technology. The STEP procedure has no new technical feature built into it, but instead focuses on the design and delivery of e-Learning.

Romiszowski (2004) states that the nature of learning has placed more emphasis on self-study, self-evaluation, student autonomy and self-reliance. He further states that in the new e-learning environment, the roles of the teacher and students have changed and there has been insufficient research and evaluation on this new trend. The new design, development and presentation (STEP procedure), intents to address this issue and, it is hoped, will be a positive contribution to the art of design and presentation for future-Learning architecture.

"Over the years, many authors have tried to describe, conceptualize and visualize instructional design process, often starting from theoretical notions and ideas. Most such conceptualizations put forward a

rather homogenous view of design, depicting it as an overall problem solving process following general phases such as analysis, design and development, implementation, and evaluation (ADDIE). It is regularly asserted, however, that design processes are much more heterogenous and diverse than these ADDIE models suggested" (Visscher-Voerman & Gustafson, 2004). Smith & Ragan (1999), in Savenye et al. (2001), argue that the other similar methods available in the industry when designing and developing instructional materials are simply too broad. In the ADDIE model, while it suggests a very general overview on the workflow of how courses should be built, the design and development stage fails to specifically identify the most effective way to build e-Learning courses. The STEP process complements this stage, which can be categorized under the design and development cycle of ADDIE. The authors also examined the weaknesses during this stage, whereby the designer following the ADDIE style hardly generated and weighed alternative solutions when designing courses.
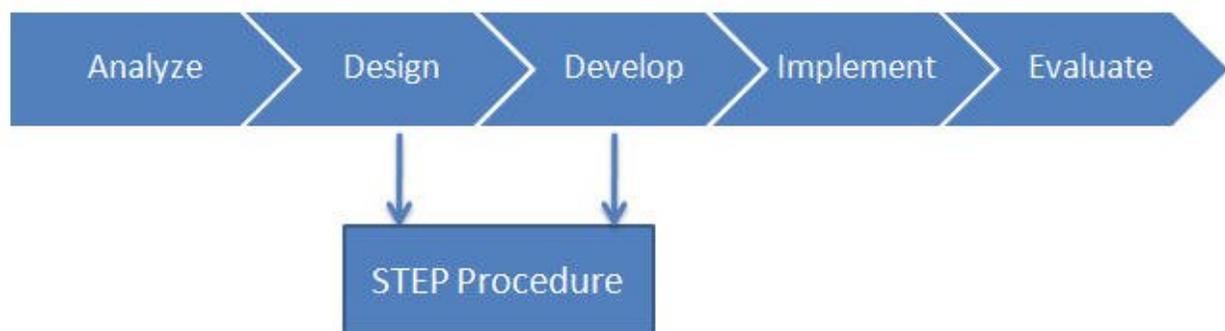

Diagram 1.1: The STEP Procedure within the ADDIE model

Baylor (2000) recommends that training sessions should become more finely focused with shorter sessions as the short-term memories of the learners are only capable of handling a maximum of seven items at a time. The author suggests that the frequency of generating feedback increases when training is kept in smaller learning chunks. Modules within the STEP procedure followed this recommendation by keeping videos under three minutes each , thereby breaking learning into smaller learning 'chunks'.

Blythe (2001) argues that design is inevitable, given the practices that instructors engage in when creating distance learning resources. Gillette (1999), in Blythe (2001), feels that instructors now view themselves as builders first and teachers second. However, many still face problems on what constitutes a good design that will work for the learners. Wagner (1998) states that practitioners view interaction as the single most significant attribute that defines distance learning experience. He further states that the interactivity involves audio, video, text and graphical information as one of the primary identifying characters of a good distance learning design. The STEP procedure uses simulations that allows learners to immediately practice and apply what they have learned using the guided simulations built into the learning modules. Moore (1989), in Wagner (1998), offers a schema that identifies the various types of interactions that should occur in learning. The type that is relevant to online learning is that interactions must take place between learners and the content they are trying to master. This is precisely the role of the guided simulations within the STEP procedure. Stephenson (2001) advocates that opportunities must be provided to 'bridge' the gap between what students already know, heard or seen in the e-lecture with how they intend to apply that knowledge. The bridging of this gap in the STEP procedure is

that immediately after a learner watches, hears and observes the e-lecture, they then proceed to the next learning component where they must apply their new skills using the guided simulation. Wagner (1998) believes that interaction in distance education must have two purposes, which are that they must change the learners, and they must move learners towards an action state of goal attainment. The STEP procedure's last stage is 'pass', which gives the sense of achievement to the learner should they feel they have mastered a learning component. This is the goal of the STEP procedure, which allows a learner to pause and reflect and feel a sense of achievement after each learning component.

Advocates of Internet-based education are largely positive and optimistic about its potential [e-Learning] (Relan & Gillani, 1997, in Johnson et al., 2000). But before it can be fully accepted by the mainstream public and educational community, many challenges must be addressed (Hill, 1997, in Johnson et al. 2000). These challenges include the development of a satisfying learning environment and the implementation of quality online instruction (Johnson et. al, 2000). Research has shown that online learning can be as effective as face-to-face learning in many respects in spite of the fact that students in online programs may be less satisfied with their experience than students in more traditional learning environments (Johnson et. al, 2000). The STEP procedure aims to increase satisfaction in learning amongst learners. When learning is perceived to be fun, a correlation can be found with the perceived satisfaction of the course.

Ball State University conducted a study to compare the 'impression' of classroom training versus Web-based training. Students were divided into two groups; one in a traditional class and the other in a web-based class. The web-based students felt that electronic instruction facilitated greater depth of learning; however, they felt disconnected from their class members and poor technical problems as feedback received was not always clear. (Brown, 2000). In a corporate environment, this usually is not the case as many are busy working professionals and would prefer training that caters to their busy lifestyle as Schmidt(2005) mentions that a learner in the corporate environment is not primarily into learning but usually working and that they interrupt their work in order to undertake learning. Corporations also typically invest in high end technical solutions such as T1 broadband thus technical problems are rarely an issue when web based training modules are accessed from work. The key here is that online learners did feel that electronic instruction facilitated greater depth of learning and this is essentially what employees seek when taking web based training.

Driscoll (2001), in Strother (2002), does caution that e-learning is not just about technology, but also many human factors. In a study by Fong and others (2003), they discuss the various human computer interaction (HCI) principles in design and the implementation of workflow based e-Learning by listing 10 basic principles that drive design. These include consistency, aesthetic integrity, perceived stability, see-and-point, direct manipulation, metaphors from the real world, What You See Is What You Get (WYSIWYG), feedback and dialog, forgiveness and user control. The study above recognized some of the significant design flaws that exist in the marketplace today, for example, the overuse of graphic images to represent concepts. These images may very well be distracting to the users. A simple design also gives the perception of stability, along with the consistency needed by the learner. Fong and others (2003) also state that the users, and not the computers, must initiate and control actions within the e-Learning environment. The STEP procedure incorporated many of the recommended principles above in its design and presentation for example, the learner has full control over their own learning and the

guided simulations contains elements of forgiveness, where the learner was allowed two attempts before the correct response was shown. Simplicity was also an important factor in the design of the website hosting the STEP based learning materials. The researcher avoided a web site design that seemed busy.

The STEP procedure that is the focus of this dissertation is built around the notion that learning should be continuously engaging to the learners through the use of video, simulations and quizzes and built around a framework that will work in a corporate environment.

2.5 Statement and justification of the research questions.

In order to explore the idea and to investigate whether the author's design and presentation style has any impact on the learner, this study will address the following statement.

"The STEP procedure in corporate training environments: An investigation in how design and presentation facilitates learning".

"Everybody talks about it, but nobody does anything about it" - Mark Twain

While most authors only recommend strategies and suggestions, there has yet to be seen a specific design process or a design theory that is actually in place and a study done to study its effectiveness and impact on learning. Many focus on the theoretical aspects of what constitutes a good design for e-learning, but not enough has been done on the implementation part. Therefore, an insightful investigation is necessary to study these theoretical recommendations by actually developing an e-learning course using what is considered a good design practice based on various suggestions by professionals in the said area. It is the right time to see if the proposed STEP procedure can in fact engage the learner to learn better.

Although this study focuses on a specific design and delivery of online training created by the author based on literature review and personal experience in the industry, it does not necessarily discount the other methods and procedures used in the design and development of current e-Learning styles available in the market, if any. Nor does it mean that the results obtained from the field work can be considered applicable universally and that all students and learners will benefit from the design and presentation discussed in this paper. However, the reason for this study to be pursued is to address the difficulties encountered to some extent by students learning in this type of environment, since e-Learning is a relatively new medium or platform for delivering course content. Prensky (2001) argues that 'our students have changed radically. Today's students are no longer the people our educational system was designed to teach.' This study aims to investigate if the proposed design procedure will enhance learning. Strother (2002) argues that while there is no doubt that we see an increasing number of case studies showing success with e-learning, it is still difficult to find research that measures learning in a specialized setting using a corporate training program. This research aims to contribute to this deficiency through the introduction of the STEP procedure.

The study will attempt to answer the following research questions:

1. What are student's learning difficulties in an online training environment? What do they like and dislike?

2. Can the S.T.E.P procedure overcome this difficulty? Do they like the design, look and feel of how the information is presented to them?

3. Is there a difference in the pre test and the post test scores? What do the scores mean?

This study definitely needs to be pursued to determine whether the proposed procedure following good practices, as built based on expert recommendation from practitioners from the field, facilitates learning.

Chapter 3: Research Methodology and Methods

3.1 Research Design

The research was based on multiple methods of data gathering. This included collection of demographic data, pre- and post-test results, and notes and observations from the semi- structured interviews that were conducted with a sample of participants who completed the training.

Specifically, during the field work, the participants were involved in an hour-long session that involved four stages.

1. Participants were asked to take a pretest based on multiple choice questions to assess their understanding of the basics of Office 2007 prior to the online training. These scores were recorded.
2. Participants were then asked to complete a short web-based questionnaire. The questionnaire was designed to collect basic demographic data and data about the participants' previous experiences and perceptions of using technology and e-learning tools, as well as their general opinions.
3. Participants participated in the online training in Office 2007 using the STEP procedure.
4. Upon completion, the learners then participated in a post-test, where additional information was collected.

5. Further in-depth meaning was observed through the one-on-one interviews with a proportion of participants that were carried out one to four weeks after the session. This allowed for the researcher to 'confirm' data that was observed from the web-based survey and to seek additional information.

Such an approach is a appropriate to address the research questions set out in chapter 2. Using a range of methods enables the researcher to triangulate the data. Creswell and Miller (2000) describe the postpositivist triangulation procedure as such: 'A popular practice is for qualitative enquirers to provide corroborating evidence collected through multiple methods, such as observations, interviews and documents to locate major and minor themes.'

The very concept of triangulation allows the researcher to use multiple strategies to study the phenomenon. (Denzin, 1989). Sands & Roer-Strier, (2006) also noted that the researcher is free to determine his or her own style when conducting a study using the triangulation method. When I conducted my field work, similar findings were obtained from the web-based surveys and the one-on-one interviews, which was set at a later date. One can see this as gathering data on the same topic in two completely different ways.

3.2 Sampling

The sample size for this proposed study was all participants attending training at the training facility belonging to SCICOM on July 4, 2009. This consisted of 24 students (N=24). Scicom Academy is a training arm of Scicom Berhad, which is a leading business processing outsourcing company in Malaysia. The academy was established in 2002 and encompasses a wide range of training programs such as personnel training for many Malaysian and multinational companies. The 24 participants are a complete sampling size because it is the total number of possible units or elements that are included in the study.(Gray, 2004: 82; 403 in Cohen, Manion, et al., 2001). The responses gathered were a complete representation of the total population of this class. Cohen, Manion, et al. (2001) would characterize this under the non-probability sampling category, which is a small-scale research and it does not represent the wider population, but merely represents itself, as is the case with many social science-based research.

The average age of the participants was 24 years old. Sixteen students were female and seven were male. Six of them had either a diploma or an associate's degree, and seventeen had bachelor's degrees. All 24 participants had full-time job offers and were undergoing training to prepare themselves for their new roles at the workplace.

Participants were then asked to volunteer their time to participate in a one-on-one interview at a later date for further research. They were informed that lunch would be provided in exchange for their time. Cohen, L., L. Manion, et al. (2001) consider this a form of incentive to maximize response rates. A total of six participants agreed to participate in the one-on-one interview.

Learners were met one on one and not as a focus group together because Bell (2005) mentions that in a focus group setting, dominant participants may cause the prevailing members to remain quiet if their argument contradicts the dominant participants'.

More details about the methods selected are provided in the sections below.

3.3 Web Survey

As noted, the study utilized some quantitative methods. Two web-based surveys were designed and generated, in order to gather basic demographic information about the participants, their perception on online and instructor led courses, and their feedback on the STEP training.

The two surveys were designed using Survey Monkey, available at www.surveymonkey.com. The reason for choosing a web-based survey is that one the advantages of using the Internet include cost savings associated with eliminating printing of survey instruments (Cobanoglu, Warde, and Moreo, 2001). SurveyMonkey was used as data entry was more efficient and accurate and was appropriate given the fact that the learners were already sitting with a computer each. Print-outs of the web-based surveys were kept in hand in the event of weak wifi signals as cautioned by the organization (SCICOM Academy). Five participants could not access the web-based survey because of the weak wifi signals on the day of the field research and choose to fill out the paper-based surveys instead. The researcher then collected

the responses and manually added them to the web-based survey at a later time. Based on the learners input, the data was then used to derive meaning in the form of analyzable data, i.e. quantifiable data from all of the participants.

The survey was rewritten and improved five times. Improvements were made after a small pilot study was conducted with one participant. As Bell (2006) argues, it is very tempting for smaller research projects to skip the pilot study process. Yet this trial run is extremely important. The trial run can potentially save the researcher a great deal of frustration in the future, as it will help in the design and presentation of the final product. Thus, in accordance with the experts, a pilot study was conducted and modifications were made based on initial feedback. Any ambiguities in the questions were also addressed at this point. Questions that were deemed irrelevant were also removed after several discussions with the course supervisor and revisiting the goal of the research and consulting with literature review from Donald L. Kirkpatrick (1996) on appropriate ways to measure the impact of training on learner experience and learning outcomes.

3.4 Interviews

In this study, the interviews played a critical role in the research process as they provided an in-depth exploration of some of the issues associated with the research questions. Six interviews were conducted. The participants were met near their homes and the conversations were recorded with their approval. Participants were identified by number during the recording, therefore maintaining anonymity. The recordings were then transferred to the researcher's computer and kept securely. At the final stage of the interview analysis, they were linked together to the data obtained from the web based surveys and presented to support the overall interpretation of the data in Chapter 5. The interview data can be considered as a confirmatory data analysis where Ramsey and Steele (1977) state that such is the case if the same findings are reappear from the same sample population.

Creswell (1994) states that data collection procedures involve four basic types; observations, interviews, documents and visual images. For the scope of this study, the data was derived from interviews and web-based pre- and post-surveys. It was gathered through semi-structured, one-on-one interviews performed by the researcher asking the learner a series of semi-structured questions along with a tape recorder recording the discussion. Students' pre- and post-test scores were also analyzed and compared, and discussed with the learner during the interview. Transcribing data from the tape recorder was not necessary, as modern digital technology allowed the researcher to transfer audio tracks to the computer. This allowed the researcher to listen to the interview an unlimited number of times and keep the data in a safe, secure location. The audio files were ultimately transferred to the researcher's laptop and kept in a password-protected folder. Steps were taken to ensure that such data was kept safe.

Semistructured interview style was used as the researcher did not want the restrictions and rigidity of structured interviews. Since the learners have already taken a survey which is somewhat a form of a structured interview on paper, the researcher wanted to explore the topics at greater depth.

Klandermans and Staggenborg (2002) state that semistructured interviews provide greater breadth and depth and they are able to discover ideas and thoughts in their own words and not the researcher's words. The semistructured style also enabled the researcher to change questions based on the responses from the interviewee.

For learning to take place, participants will notice a change of attitude, improve their knowledge and/or increase their skills in the topic taught according to Kirkpatrick (1996). The field work attempted to study if those elements were observed through interviews with the participants..

3.5 Data Analysis

Because of the small sample size of the student population, no attempt was made to use formal statistical significance or sample size techniques to infer that the results of this study represented larger populations. Instead, basic descriptive analyses using means and correlations are used. In order to answer the research questions posed earlier, a qualitative data analysis strategy was employed to find evidence of any trends. The analysis was done by data analyzed through Survey-Monkey, cross tabulations, and interviews. Charts, diagrams and tables were created based on the data obtained in the web based surveys. These allowed the researcher to observe patterns. Basic coding was also conducted on the interviews. Pre-determined coding categories were labeled and the interviews were then transcribed under these categories. These categories were then matched to the research questions. The categories are Exploring the Difficulties Faced by Learners , Ease of Use, Design and Presentation, Their learning experience and Studying the 'Effects' of the Online Training Using the STEP Procedure. At the final stage of the interview analysis, they were linked together to the data obtained from the web based surveys and presented to support the overall interpretation of the data in Chapter 5. The interview data can be considered as a confirmatory data analysis where Ramsey and Steele (1977) state that such is the case if the same findings are reappear from the same sample population.

The researcher was the creator and developer of the STEP procedure, therefore some form of bias may exist when this research was carried out. Grimes and Schulz (2002) state that bias can undermine the internal validity of research. The true challenge is to be able identify the preconceived biasness and not allow the research and data to be affected by it. The survey questions were reworded several times to remove any biasness identified by the researcher. When the experiment was carried out on the learners, the learners were told to give their honest opinion and feedback on the STEP procedure and the reasons for the research.

3.6 Ethical Considerations

This research was conducted in accordance with the guidelines and practices set by professional associations such as the British Sociological Association (BSA), the Social Research Association (SRA) and Central University Research Ethics Committee (CUREC). For example, the researcher had access to the learners' grades attained through the field work. Steps were be taken to ensure that such data was kept safe, as not adhering to this would be a violation of one of the ethical principles discussed by Diener and Crandall (1978), which is invasion of privacy. The other three principles mentioned that are relevant to

this project, are harm to participants, lack of informed consent, and deception (Diener and Crandall in Bryman, 2004). The scores obtained in the pre- and post-tests were not shared with the participants' employers. Before conducting the study, participants received two document providing background information for the study and a consent form seeking their approval to be a part of the study. Both these forms had previously been approved by CUREC. Participants were aware that they could withdraw from the study at any time. The Letter of Consent and Information for Participants documents are available in the appendix.

 The benefits of this study are both professional and personal. This study will be a useful addition to the knowledge base in the development and design of e-Learning modules in the future. Future content creators, instructors, and instructional designers will discover a new procedure in developing e-Learning that can contribute to and enhance online/distance learning. There were no risks involved to the participants in the field work conducted. Students were also given copies of free training in Office 2007 for participating in this study.

3.7 Validity

If one looks only at the definition of validity at the face level, where Hardy and Bryman (2004) describe validity as a concern towards whether the issue of a variable measures what it is supposed to measure, it almost appears that there is very little to argue about. '[validity] An account is valid or true if it represents accurately those features of the phenomena that it is intended to describe, explain or theorise.' Hammersley & Mason (1992), in Bryman (2008), regards validity and reliability as the most important criteria in research. 'Thus, validity refers to whatever 'you are observing, identifying, or "measuring" what you say you are' (Mason in Bryman, 2008). However, notable authors such as Bryman (2008) state that measurement is not a major preoccupation among qualitative researchers, thus this would be something difficult to measure.

Bryman (2008) states that it is sometimes difficult to establish from qualitative research what the researcher actually did and how he or she arrived at the study's conclusions. It is said that while the definition of validity in a quantitative study is argued to be different from the validity in a qualitative study, how and which type of validity within qualitative study should be conducted generates much discussion as it has been slow to develop (Huberman & Miles, 2002). Then there are researchers who claim that perfect validity is theoretically unattainable because no experiment can be perfectly controlled and no measuring equipment can be perfectly calibrated (Kirk & Miller, 1986). Bryman (2008) argued that non social science researchers must understand that the difference here [in qualitative research] is rich, deep data versus hard, reliable data. 'The most important and the main idea of validity is with the factual accuracy of the research, i.e. data is not made up or distorted based on what was heard or observed' (Huberman & Miles 2002). The research dealt with a pre- and post-test, was in an electronic format, stored by SurveyMonkey, and is available any time. The one-on-one interviews that followed were digitally recorded. This ensured that data was neither made up nor distorted because the recorded interviews are available electronically. The data obtained from the pre- and post-tests are mainly quantitative type data which will be used as a persuasive narrative for this study, and therefore

should not be subject to any misconceptions. The data from SurveyMonkey in the form of tables and are made available in this dissertation.

While internal reliability, internal validity and external validity are mostly irrelevant for this type of research, measures were taken so that the alternative criteria for evaluating this qualitative research was undertaken as proposed by Lincoln and Guba in Bryman (2004), which are trustworthiness and authenticity.

Since qualitative studies are difficult to replicate in most instances, the end report was carefully prepared from a rich account of an event that has taken place with the assistance of the pre- and post-tests, surveys and interviews conducted. A trail of evidence to support this research is available.

Warwick and Osherson (1973) state that every method of data collection is only an approximation of knowledge and it provides a different and usually valid glimpse of reality, and all are limited when used alone. This study is a glimpse of what took place in July, 2009 at SCICOM's training center in Petaling Jaya, Malaysia.

Chapter 4: Findings

This chapter presents the findings of the field work from the pre and post survey. The analysis, discussion of data and conclusions drawn, along with recommendations will be discussed in Chapter 5. Since the sample size for this research is relatively small, statistical analysis of the cross tabulation data below was not conducted but rather the observation of patterns of data that emerged.

4.1 Demographic information

As noted above 24 students participated in the study. Demographic information was collected via the first web based survey. The average age of the participants was 24 years old. As can be seen in table 1.0, of the respondents that did respond to the gender question, 30.4% were males (7 respondents) and 69.6% were females (16 respondents). When asked to specify their highest level of education, 6 of the respondents (26.1%) listed having a diploma or associate's degree as their highest level of education and 17 respondents (73.9%) listed having a bachelor's degree. Of the 18 that did respond to the question regarding employment, all 18 (100%) respondents were employed full time. When asked to rate their computer skills from poor to excellent, 7 respondents (30.4%) described their skills as being fair, 14 respondents (60.9%) described their skills as good and 2 respondents (8.7%) listed themselves as having excellent computer skills.

	Number of learners (N=24)	Percent
Gender:		
Male	7	30.4
Female	16	69.6
Missing	1	
Education:		
Diploma/Associate Degree	6	26.1
Bachelor's Degree	17	73.9
Missing	1	
Status:		
Fulltime	18	100
Parttime	0	
Missing	6	
Computer Skills:		
Poor	0	
Fair	7	30.4
Good	14	60.9
Excellent	2	8.7
Missing	1	

Table 1.0: Demographic Information

4.1.1 Use of Technology

Based on figure 1.0 below, it appears that students are well versed with using the computer and using web 2.0 technologies.

Which of the following technologies do you use in your personal life? (Please tick all that apply)
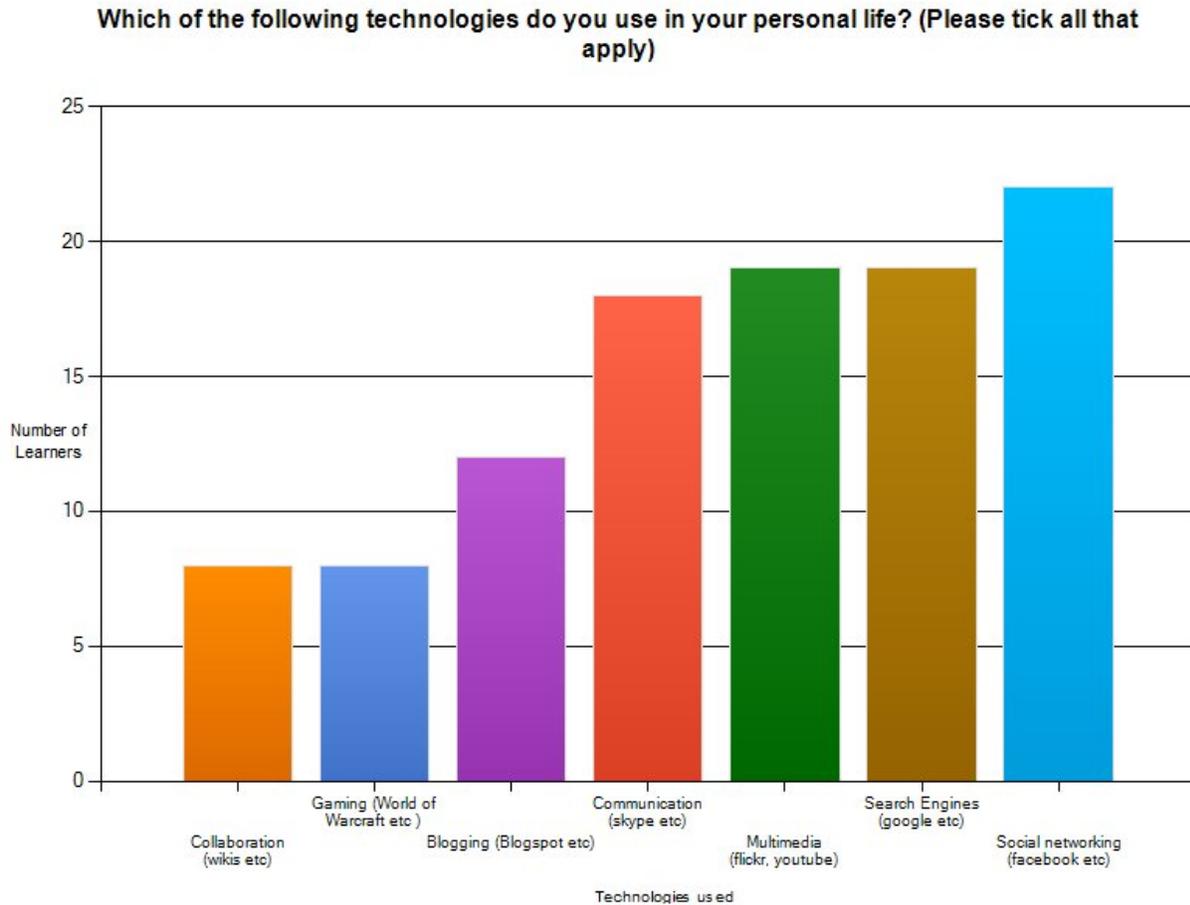
Figure 1.0: Personal use of technologies

For example, 18 respondents (78.3%) had used some form of communication-based technology such as Skype; 22 respondents (95.7%) had used social networking sites such as Facebook; and 19 respondents (82.6%) had used multimedia-based technologies such as YouTube, Flickr, etc.. A cross-tabulation was performed with the usage of the following technologies with gender and no significant differences were discovered with regard to using different types of technology. The only noticeable difference was in the gaming segment, where males led by 10% over the female participants.

4.2 Test Scores

4.2.1 Pre-Test

Learners were also given a pretest to test their understanding of Office 2007 prior to taking the online training using the STEP procedure. Overall, the learners understanding of Office 2007 was not sufficient. Participants were required to achieve a score of 80% to pass the course. There were 10 questions in the overview quiz and the quiz was kept relatively easy as they had very little to learn prior to taking the quiz. The researcher personally thought that 8 out of 10 questions correct was acceptable as a passing score. Anything below meant they had to review the modules again.

What was the score achieved on the Pre-Test?

Figure 2.0: Pre-Test scores

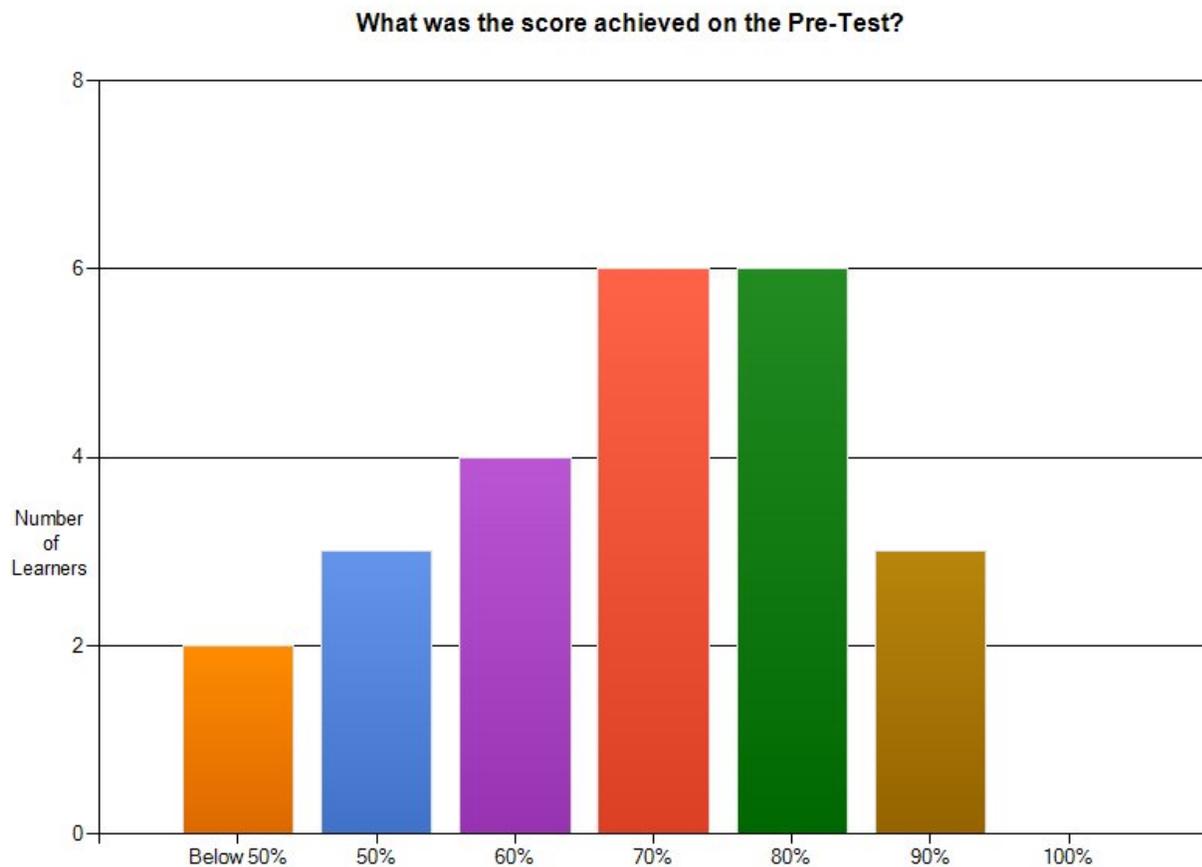As can be seen in Figure 2.0 above, only 37.5% of the participants scored 80% and above, essentially passing the course. The average test score for the pretest was 63.33%. Two respondents (8.3%) scored below 50%, 3 respondents (12.5%) scored 50%, 4 respondents (16.7%) scored 60%, 6 respondents (25%) scored 70%, 6 respondents (25%) scored 80% and 3 respondents (12.5%) scored at the 90th percentile.

4.2.2 Post-Test

Figure 3.0 below indicates the scores obtained by the respondents after taking the online training in Office 2007 using the STEP procedure. Pre- and post-test questions were identical. All participants (100%) passed the post-test. The average test score for the post-test was 95.79%.

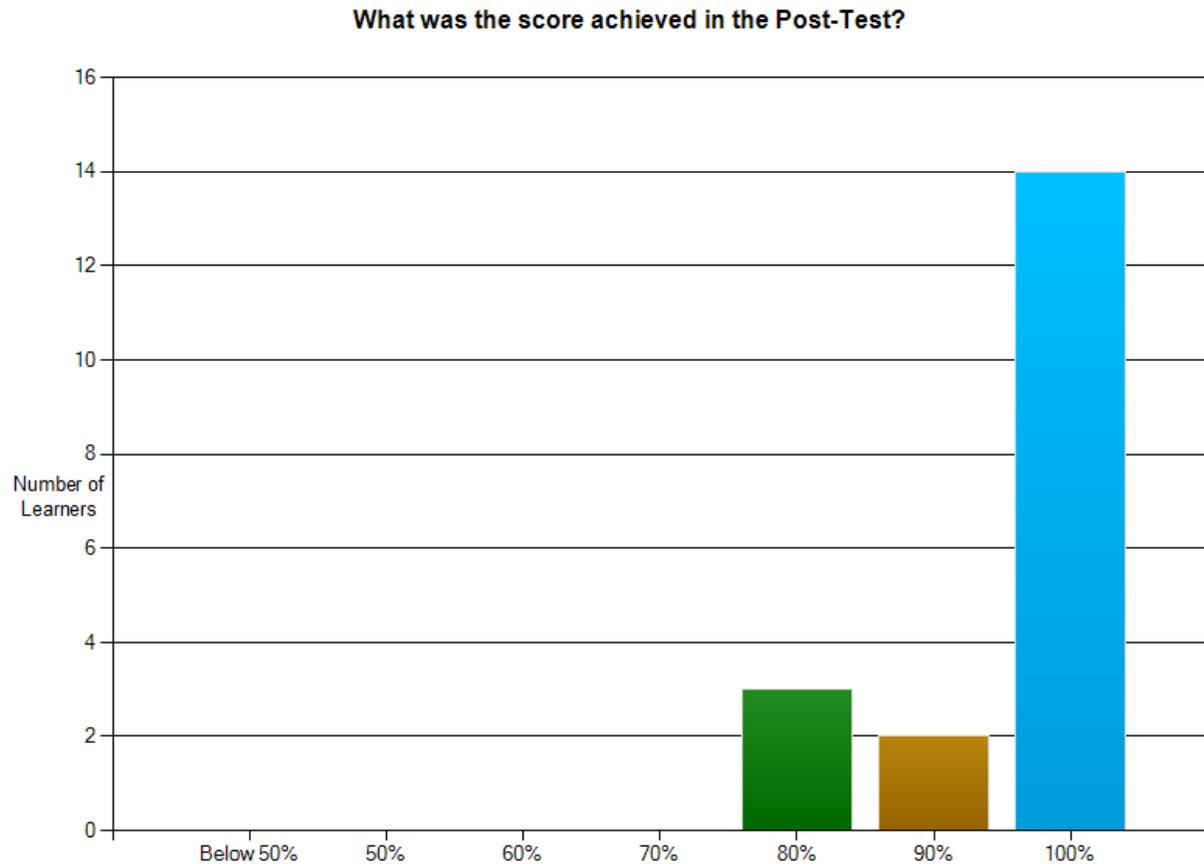**What was the score achieved in the Post-Test?**

Figure 3.0: Post-Test scores

In the post-test as seen in figure 3.0, the scores were unevenly distributed and concentrated in a higher peak to the right side of the range. Three respondents (15.8%) scored 80% on the post-test, 2 respondents (10.5%) scored 90% and 14 respondents (73.7%) scored 100%.

4.2.3 Average Pre- and Post-Test

	Experimental Group
Average Pre Test	68.33
Average Post Test	95.79
Gain	+27.46

Table 2.0: Average Pre and Post test scores

As observed in table 2.0 above, a gain of 27.46% was observed from the pre- to the post-test. Further analysis of this gain is discussed in Chapter 5.

4.3 Online Experience

4.3.1 Have Taken an Online Course

When asked if the learner is currently taking or has taken previously an online course in the last three years, the majority of the learners indicated that they have not taken an online course in the past three years. The survey revealed that only 1 respondent (4%) had taken an online course versus 23 respondents (96%) who had not taken an online course in the past three years. This could be due to either of the following reasons:

i. The age of the learners, who were mostly under 24 years old
ii. The fact that online courses are yet to be popular in Malaysia

Since the learners were mostly under 24 years old, they may lack the experience or opportunity to take online courses through their workplace or it has been more than three years since they last took an online course. Another possibility is that even though all the participants had either a diploma or associate's degree, higher educational institutions in Malaysia still lag behind in their offerings for online courses for students. Ideally, the researcher would have preferred a higher number of learners having had online experience in the past so that they would be able to compare their experience with the online course using the STEP procedure.

4.3.2 Weaknesses of Online Courses

Figure 4.0 below represents the perceived weaknesses of an online course by the learners as identified by the online survey. The learners were allowed to select all applicable answers. Irrelevancy is perceived as a key weakness of an online course. This is in reference to the course content being irrelevant to the learner.

In your opinion based on your previous experience, if any, what are the weaknesses of an online course? (Please select all that apply)
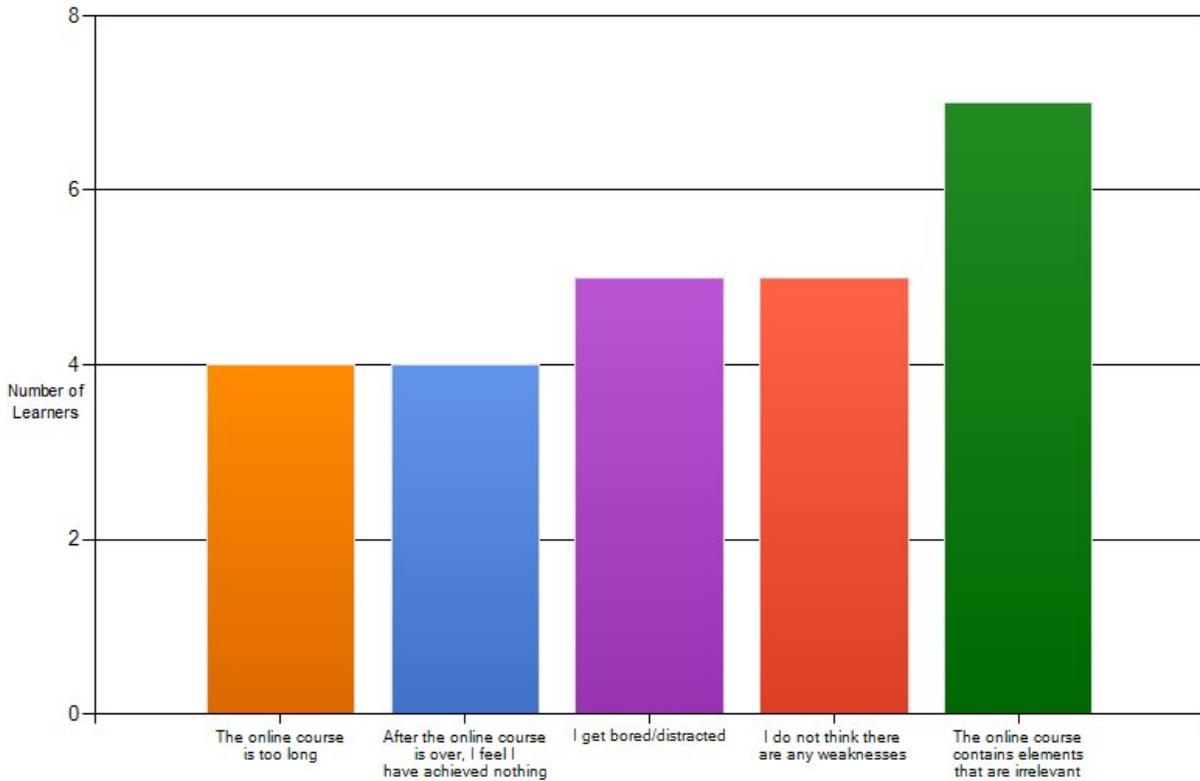
Figure 4.0: Weaknesses of an online course

As seen in figure 4.0 above, five respondents (22.7%) reported that they get distracted/bored with an online course, 4 respondents (18.2%) reported that an online course is too long, 4 respondents (18.2%) also reported that they usually feel like they have achieved nothing after taking an online course, 7 respondents (31.8%) stated that they feel that the course content is irrelevant, and 5 respondents (22.7%) stated that they do not feel there are any weaknesses associated with online classes. In the open-ended portion to this question, in which a participant could select 'Other', 3 respondents indicated that they did not know because they do not have the experience and that an online course is not recognized. This could be in reference to online degrees that carry very little weight with prospective employers for employment in this region.

4.3.3 Strength of an online course

Figure 5.0 below represents the perceived strengths of an online course by the learners as identified by the online survey. The learners were allowed to select all applicable answers. Flexibility is perceived as a key benefit of an online course.

In your opinion based on your previous experience, if any, what are the strengths of an online course? (Please select all that apply)
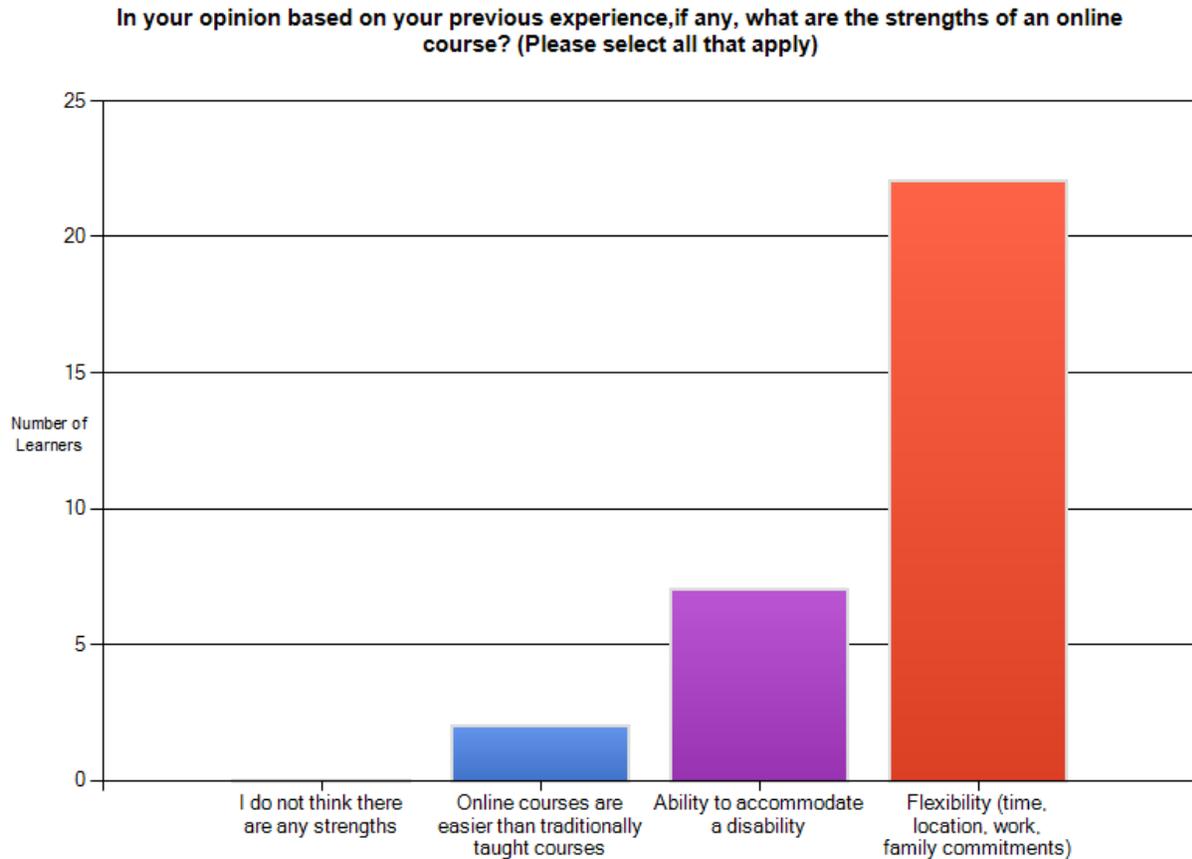
Figure 5.0: Strengths of an online course

As seen in Figure 5.0 above, twenty-two respondents (95.7%) felt that the major strength of an online course is its flexibility, 7 respondents (30.4%) felt that it has the ability to accommodate a disability, 2 respondents (8.7%) felt that an online course was easier than a traditional face to face course, and no respondents indicated there are no strengths in an online course. In the open-ended portion to this question, in which a participant could select 'Other', 2 respondents indicated that an online course might be easy for some and that it could also be cheaper.

4.4 Instructor-Led Experience

When asked the number of respondents who have taken a traditional face-to-face course in the previous three years, sixteen respondents (69.6%) have taken a face-to-face, instructor-led course, whereas 7 respondents (30.4%) selected that they have never taken a face-to-face, instructor-led

course. There is some ambiguity with regard to this question. The average age of the participants is 24 years old. This means that there is a possibility that they have not taken an instructor-led course in the past three years because in Malaysia, students graduate from high school at the age of 17+. All participants have a diploma or associate's degree, as indicated in the survey data. A diploma takes two years to complete, while a degree typically takes three. However, the ambiguity is that the researcher realized that on the day of the field work, all participants were undergoing an instructor-led training program conducted by SCICOM training academy, and had been for the past eight weeks, which meant they were currently taking an instructor-led course. Therefore, the only conclusion that can be made with this data is that the learners misinterpreted the survey question by discounting the fact that they were currently taking an instructor-led course.

4.3.1 Weakness of Instructor-Led Course

Figure 6.0 below depicts the respondents' perception on the weakness of an instructor-led course. Getting bored or distracted and course being too long are perceived as the main weaknesses of an instructor led course.
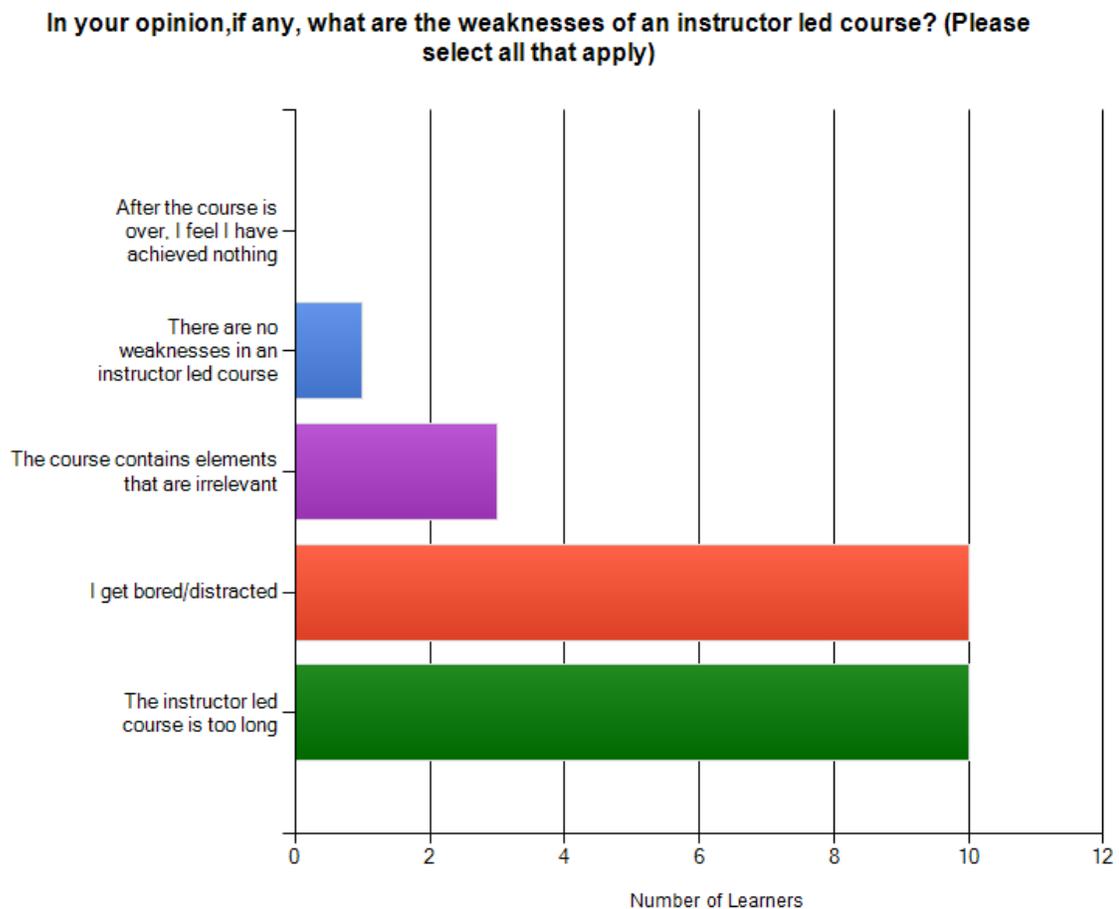
In your opinion,if any, what are the weaknesses of an instructor led course? (Please select all that apply)

Figure 6.0: Weakness of an instructor led course

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For example in figure 6.0, ten respondents (47.6%) felt that they get bored or distracted in an instructor-led course. The same number of respondents (47.6%), felt that an instructor-led course was too long. No respondents felt that they have achieved nothing after taking an instructor-led course. Three respondents (14.3%) felt that an instructor-led course can contain elements that are irrelevant, and finally, only 1 respondent (4.8%) felt that there are no weaknesses in an instructor-led course. In the open-ended portion to this question, in which a participant could select 'Other', 3 respondents indicated that an instructor-led course may contain irrelevant content, and that instructors do not meet expectations, and do not possess relevant knowledge in the subject matter.

	Distracted/Bored	Too long	Did not achieve anything	Irrelevant	No weaknesses
Instructor-led	47.6	47.6	0	14.3	4.8
Online	22.7	18.2	18.2	31.8	22.7
Difference	24.9	28.8	18.2	17.5	17.9

Table 3.0: Online and instructor led comparison

As observed in table 3.0 above, a difference of 24.9% was observed when asked about being distracted or getting bored in an in instructor led course and an online course and 28.8% difference when asked if they felt the courses were too long. Further analysis of the differences are discussed in Chapter 5.

4.3.2 Strength of Instructor-Led Course

Figure 7.0 below represents the perceived strengths of an instructor-led course by the learners. The learners were allowed to select all applicable answers. Ability to accommodate a disability is perceived as a key benefit of an instructor led course.

In your opinion, if any, what are the strengths of an instructor led course? (Please select all that apply)
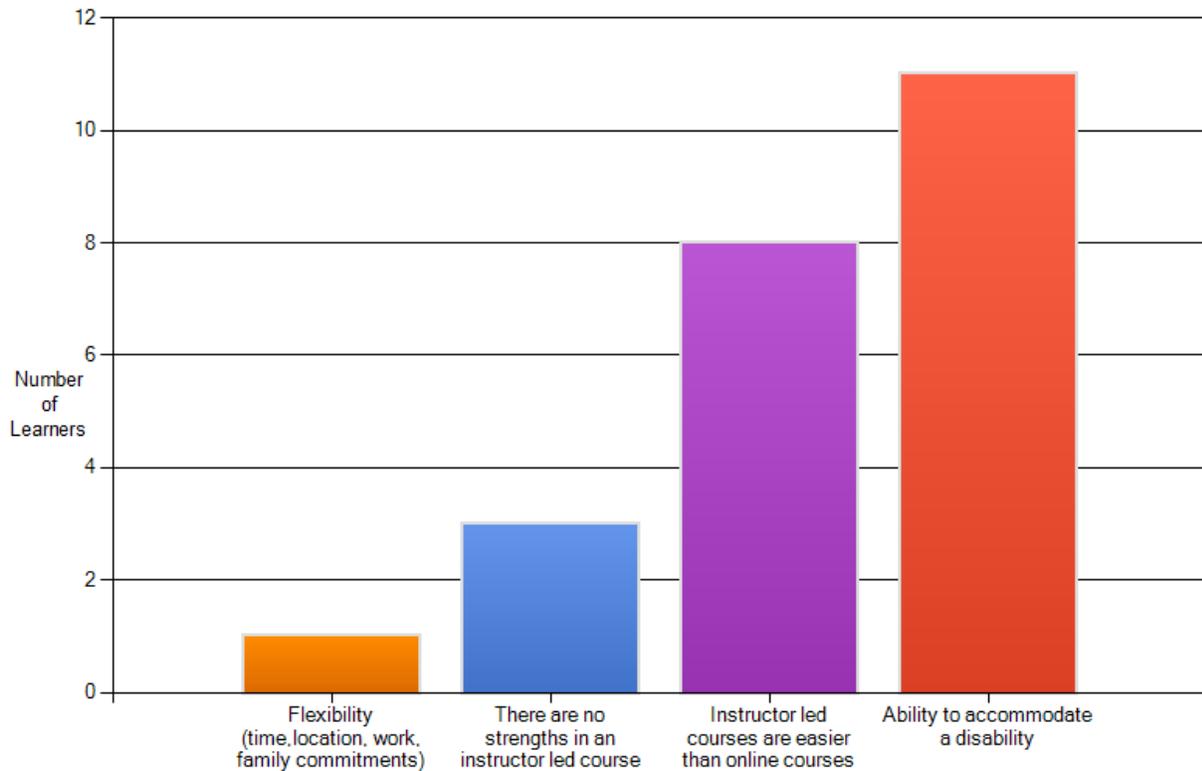
Figure 7.0: Strengths of an instructor led course

Only one respondent (4.5%) felt that the major strength of an instructor-led course is its flexibility, 11 respondents (50%) felt that it has the ability to accommodate a disability, 8 respondents (36.4%) felt that an instructor-led course was easier than a online course, and 3 respondents (13.6%) indicated there are no strengths in an instructor-led course. In the open-ended portion to this question, in which a participant could select 'Other', 1 respondent indicated that by having an instructor present in class, the instructor would be able to explain any material that a student did not understand.

	Flexibility	Accommodate Disability	Easier	No Strength
Instructor-led	4.5	50	36.4	13.6
Online	95.7	30.4	8.7	0
Difference	91.2	19.6	27.7	13.6

Table 4.0: Comparison of strength

As observed in table 4.0 above, a difference of 91.2% was observed in flexibility between an instructor led course and an online course. Further analysis of this difference is discussed in Chapter 5.

4.5 Experiences of using the STEP procedure for training in Office 2007

The data in this section is based on the findings from the post- training survey. In this survey, there was a drop of respondents from 24 to 19 (a drop of 20.8%). There are several reasons why post surveys see a drop in the number of respondents. Reasons include participants being uninterested or disliking the topic being researched, the length of the questionnaire and being insufficiently involved in the subject being researched (McAvoy and Kaner, 1996). While not ideal, this drop in the number of respondents is common in survey research. Indeed, some researchers have suggested it is better to have a drop in respondents then to generate data that would include learners participating with reasons suggested above.

4.5.1 Ease of Use

As can be seen in table 5.0, all of the participants agreed or strongly agreed with the statement, "The online training in Office 2007 was easy to use" No participants selected neutral, disagree or strongly disagree. The online training in Office 2007 using the STEP procedure as being easy to use was perceived to be agreed by all learners.

Please indicate your agreement with the following statement on a scale from strongly agree to strongly disagree: The online training in Office 2007 was easy to use.		
Strongly Agree	13	68.4%
Agree	6	31.6%
Neutral	0	
Disagree	0	
Strongly Disagree	0	
Total	(n=19)	100%

Table 5.0: Ease of use

4.5.2 Learning Experience

As seen from Figure 8.0, when asked to rate their learning experience based on their recent experience using the STEP procedure when learning Office 2007, learners were very pleased with the presentation style, the design of the website containing the learning materials and the ease of locating materials.
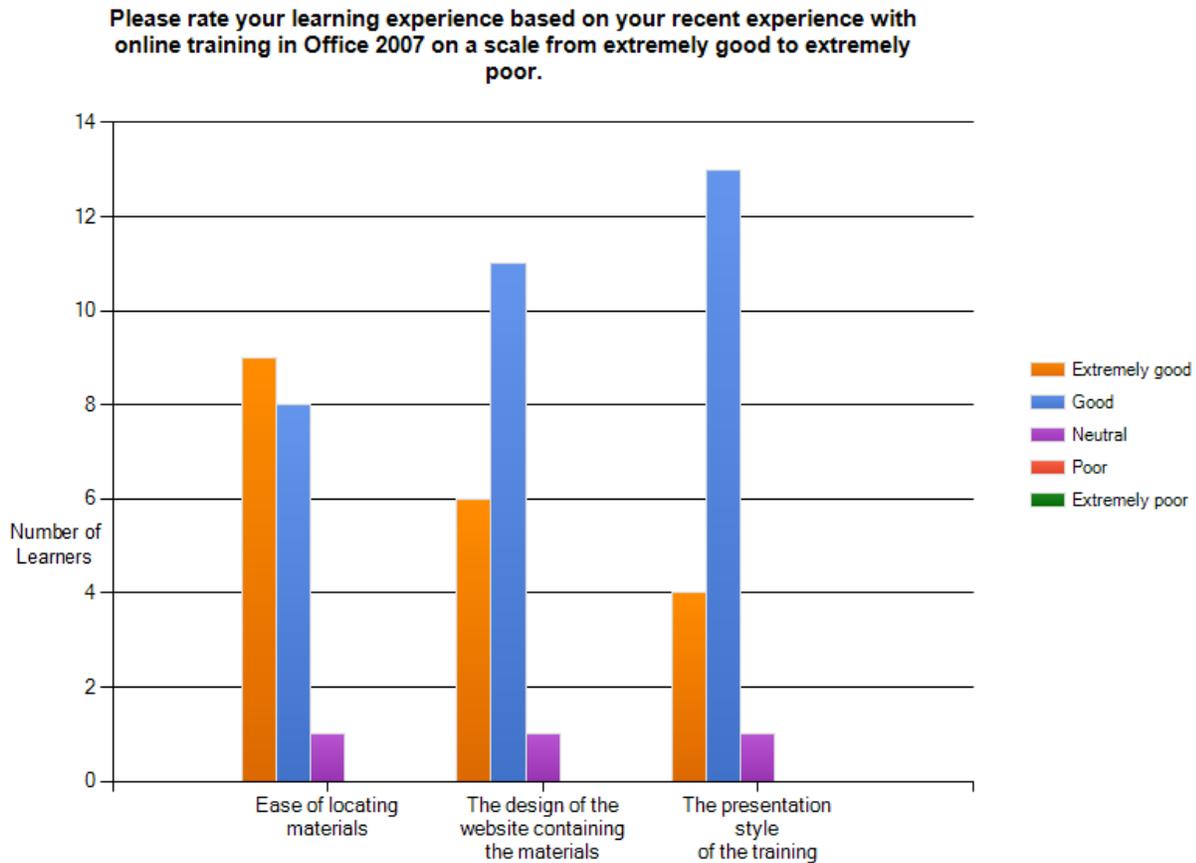
Figure 8.0: Learning experience with Step procedure

In Figure 8.0, nine participants (50%) found it to be extremely good, 8 participants (44.8%) found it to be good and 1 participant (5.6%) chose to remain neutral. When asked about the design of the website hosting the online training materials, 6 participants found it to be extremely good, 11 participants (61.1%) said it was good and 1 participant (5.6%) chose to remain neutral. When asked about the presentation style of the online training, 4 participants (22.2%) thought it was extremely good, 13 participants (72.2%) selected good and 1 participant (5.6%) chose to remain neutral.

4.5.3 Learning experience using the STEP Procedure

As observed in Table 6.0 below, all the participants (100%) selected either Agree or Strongly Agree when asked if they felt positive about their learning experience using the STEP procedure. They were then asked again if they preferred face-to-face learning after taking the training using the STEP procedure, and only 2 (11.1%) participants said they did, while the remaining 16 participants selected to remain neutral, disagreed or strongly disagreed. Sixteen participants (88.9%) liked the method of being assessed after each learning module (learning component). No participants disagreed or strongly disagreed with having been assessed immediately.

Please state your agreement with the following on a scale from strongly agree to strongly disagree.					
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I feel positive about my learning experience today	50.0%	50.0%	0.0%	0.0%	0.0%
I prefer face to face learning	0.0%	11.1%	66.7%	16.7%	5.6%
I like the way I was assessed after each learning module	11.1%	77.8%	11.1%	0.0%	0.0%
The simulations helped me practice what I learned	38.9%	44.4%	11.1%	5.6%	0.0%
I have more control over my learning	38.9%	44.4%	16.7%	0.0%	0.0%
I miss the interaction with other students	5.6%	38.9%	27.8%		0.0%
I liked the look and feel (layout) of the online training	16.7%	66.7%	5.6%	5.6%	0.0%
I understand the materials better because of the way the courses were designed	22.4%	72.2%	5.6%	0.0%	0.0%
I understand the materials better because of the way the courses were presented	33.3%	55.6%	11.1%	0.0%	0.0%
The length of each video was too short	0.0%	22.2%	55.6%	22.2%	0.0%
The length of the simulations were too short	5.6%	11.1%	72.2%	11.1%	0.0%
Learning this way was fun	27.8%	61.1%	5.6%	5.6%	0.0%
I understood all the learning materials presented today	44.4%	50.0%	0.0%	5.6%	0.0%

Table 6.0: Reactions to e-Learning module

When asked if the simulations within the STEP procedure helped them to practice what they had just learned, 15 participants (83.3%) agreed that it did and 1 participant (5.6%) disagreed. The students were also asked if they felt they had control over their learning, and 15 participants (83.3%) said it did, while the remaining (16.7%) opted to be neutral and no one disagreed.

When asked if they missed the interaction with other students, 8 participants (44.5%) either agreed or strongly agreed. 5 participants (27.8%) remained neutral and another 5 participants (27.8%) disagreed.

When asked about the look and feel (layout) of the online training, 83.4% of the participants liked the look and feel. 2 participants (11.1%) remained neutral and 1 participant (5.6%) disliked it.

When asked if they understood the materials (Office 2007) better because of the way the courses were designed, 94.4% either agreed or strongly agreed, while only 5.6% remained neutral. When asked if they understood the materials better because of the way the courses were presented, 88.9% either agreed or strongly agreed, and 2 participants (11.1%) remained neutral.

Four participants (22.4%) felt that the lengths of the videos were too short, while 10 participants (55.6%) remained neutral and 4 participants (22.4%) said they were not too short. When asked if the simulations were too short, 3 participants (16.7%) agreed that they were, 13 participants (72.2%) remained neutral and 2 participants (11.1%) said they were not too short.

When asked if learning using the STEP procedure was perceived to be fun, 16 participants (88.9%) either agreed or strongly agreed. 1 participant (5.6%) remained neutral and 1 participant (5.6%) disagreed. Seventeen participants (94.4%) said they understood all the learning materials presented to them using the STEP procedure and only 1 participant (5.6%) said they did not understand all the learning materials presented to him/her.

4.5.4 Overall Experience using STEP

When the participants were asked to rate their overall experience using the STEP procedure, learners rated their overall experience highly.

On a scale from extremely good to extremely poor, how would you rate your overall experience using the STEP procedure in online training.		
Extremely good	6	33.3%
Good	12	66.7%
Neutral	0	
Poor	0	
Extremely poor	0	
Missing	1	
Total	(n=19)	100%

Table 7.0: Overall Experience using STEP

Table 7.0 as seen above indicated that 6 participants (33.3%) said it was extremely good and 12 participants (66.7%) selected good. No participants selected neutral, poor or extremely poor.

4.5.5 Recommend STEP

As observed in table 8.0 below, learners were asked if they would recommend future training to follow similar presentation and delivery methods from a scale of 1 (absolutely not) to 5 (most certainly), the average mean score indicated that learners were more likely to recommend future training to follow similar presentation and delivery.

On a scale from 1 (absolutely not) to 5 (most certainly),would you recommend all your future online training to follow a similar presentation and delivery style?		
1	1	5.6%
2	3	16.7%
3	2	11.1%
4	10	55.6%
5	2	11.1%
Missing	1	
Total	(n=19)	100%
Average Mean Score	3.5	

Table 8.0: Recommend future training

Table 8.0 above indicated that 12 participants (66.7%) selected 4 and 5, 2 participants (11.1%) chose to remain neutral and 4 participants (22.3%) selected 1 and 2.

4.5.6 Fun, Design and Presentation

Some of the findings were cross tabulated with learners who perceived learning using the STEP procedure to be fun. The reason for this cross tabulation is because when learners perceive something to be fun, they have an engaging learning experience (Packer, 2006).

A cross-tabulation was performed to see if those who perceived learning in Office 2007 using the STEP procedure to be fun also found the design and presentation suitable. As seen in table 9.0, a strong relationship was found between those who had a good experience locating the online training materials and those who found learning to be fun overall. For example, two participants (40%) who strongly agreed that learning using the STEP procedure was fun also thought it was easy to locate materials during the online training, while 3 participants (60%) who strongly agreed that learning was fun selected that the easy of locating materials as good on a scale from extremely good to extremely poor. Five participants (45.5%) that agreed learning was fun said that the ease of locating materials was extremely good and 5 participants (45.5%) chose good in a scale from extremely good to extremely poor.

Please rate your learning experience based on your recent experience with online training in Office 2007 on a scale from extremely good to extremely poor.	Please state your agreement with the following on a scale from strongly agree to strongly disagree. -- Learning this way was fun				
Ease of locating materials	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Extremely good	2	5	1	1	0
Good	3	5	0	0	0
Neutral	0	1	0	0	0
Poor	0	0	0	0	0
Extremely poor	0	0	0	0	0
N = 19 (1 missing)	5	11	1	1	0
The design of the website containing the materials					
Extremely good	2	3	1	0	0
Good	3	8	0	0	0
Neutral	0	0	0	1	0
Poor	0	0	0	0	0
Extremely poor	0	0	0	0	0
N = 19 (1 missed)	5	11	1	1	0
The presentation style of the training					
Extremely good	1	3	0	0	0
Good	4	8	1	0	0
Neutral	0	0	0	1	0
Poor	0	0	0	0	0
Extremely poor	0	0	0	0	0
N = 19 (1 missed)	5	11	1	1	0

Table 9.0: My learning experience

From the table above, a strong relationship was found between those who liked the design of the website hosting the learning materials and those who found learning to be fun overall. For example, 2 participants (40%) who strongly agreed that learning using the STEP procedure was fun also thought the design of the website containing the training materials was extremely good, while 3 participants (60%) who strongly agreed learning was fun, selected good on a scale from extremely good to extremely poor. Three participants (27.3%) who agreed that learning was fun said that the design of the website containing the training materials was extremely good and 8 participants (72.75%) chose good in a scale from extremely good to extremely poor.

From the table above, a strong relationship was found between those who liked the presentation style of the STEP procedure and those who found learning to be fun overall. One participant (20%) who strongly agreed that learning using the STEP procedure was fun also thought the presentation style of the training materials was extremely good, while 4 participants (80%) who strongly agreed learning was fun, selected good on a scale from extremely good to extremely poor. Three participants (27.3%) who agreed that learning was fun said that the presentation style of the training was extremely good and 8 participants (72.75%) chose good in a scale from extremely good to extremely poor.

4.5.7 Fun and easy to use

Please state your agreement with the following on a scale from strongly agree to strongly disagree	Learning this way was fun				
The online training in Office 2007 was easy to use	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Strongly Agree	3	8	1	0	0
Agree	2	3	0	1	0
Neutral	0	0	0	0	0
Disagree	0	0	0	0	0
Strongly Disagree	0	0	0	0	0

Table 10.0: Easy to use and fun

When a cross-tabulation was conducted between the participants who perceived the STEP training to be fun and those who found the training easy to use as indicated in Table 10.0 above, a strong relationship was observed between those who found the online training in Office 2007 using the STEP procedure to be easy and those who found it to be fun. For example, three participants (60%) who strongly agreed that learning this way was fun also strongly agreed that the training in Office 2007 was easy to use. The remaining 2 participants (40%) agreed that it was easy to use. Eight participants (72.7%) who agreed that learning using the STEP procedure was fun strongly agreed that the training was easy to use and the remaining 3 participants who agreed that learning was fun also agreed that training in Office 2007 was easy to use.

4.5.8 Fun and positive learning experience

Please state your agreement with the following on a scale from strongly agree to strongly disagree.	Learning this way was fun				
I feel positive about my learning experience today	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Strongly agree	3	6	0	0	0
Agree	2	5	1	1	0
Neutral	0	0	0	0	0
Disagree	0	0	0	0	0
Strongly disagree	0	0	0	0	0
N = 19, 1 Skipped	5	11	1	1	0

Table 11.0: Positive and fun

When a cross-tabulation was conducted between the participants who perceived the STEP training to be fun and those who found felt positive about their learning experience on the day of the training as indicated in table 11.0 above, a strong relationship was observed between those who felt positive about their experience after taking the online training in Office 2007 using the STEP procedure and those who found it to be fun.

3 participants (60%) who strongly agreed that learning this way was fun also strongly agreed that they felt positive about their experience. The remaining 2 participants (40%) agreed that it was positive as

well. Six participants (54.5%) who agreed that learning using the STEP procedure was fun strongly agreed that learning experience was positive and the remaining 5 participants (45.5%) who agreed that learning was fun also agreed that they felt positive about their learning experience in Office 2007.

4.5.9 Material comprehension and fun

Please state your agreement with the following on a scale from strongly agree to strongly disagree.	Learning this way was fun				
I understood all the learning materials presented today	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Strongly agree	4	2	1	1	0
Agree	1	8	0	0	0
Neutral	0	0	0	0	0
Disagree	0	1	0	0	0
Strongly disagree	0	0	0	0	0
N = 19, 1 skipped	5	11	1	1	0

Table 12.0: Material comprehension and fun

As seen in table 12.0, a strong correlation was observed between those who understood all the learning materials and those who thought learning using the STEP procedure was fun. When combined, 15 participants (83.33%) who either selected strongly agree or agree when asked if learning was fun, also selected the same when asked if they understood all the learning materials. The key finding is that students who understood all the learning materials also perceived learning to be fun.

4.6 Interview data

The interview data is presented directly in Chapter 5 to support the discussion, analysis and the interpretation of data.

Chapter 5: Discussion, Analysis and Interpretation of Data

5.1 Exploring the Difficulties Faced by Learners

Because the survey data indicated that only one participant had taken an online course in the previous three years, a majority of them could not reflect back on their previous online experiences. However, the survey was written to ask what their perceptions were or what they thought about online training assuming that they had no prior experience to compare it with. The survey data revealed that the participants were highly versed with using a computer, having good computer skills and good experience with new web technologies such as web 2.0; therefore, it can be assumed that the participants were not novice computer users, had a good understanding of what an online course is and could reflect back on their own understanding of its weaknesses and strengths and how they perceive them.

5.1.1 Weaknesses of an Online Course

The key perceived weaknesses identified by the survey in figure 4.0 were that learners found online courses to be irrelevant and boring. Learners find online courses to be boring and irrelevant because learners today are different from the past. Bligh (2000) in Stephenson (2001), the rise of new technologies has caused a crisis in traditional education as students who just listen and take notes, as done traditionally, now see the traditional technique as not being effective at all in an online environment. The problem with many online courses in the marketplace today are that they are still designed and delivered using traditional techniques. These are the reasons why learners today perceive them as irrelevant and boring. Feasey (2002) states that e-Learning today is boring because it is not designed for its medium and is a result of direct conversion from classroom handouts to e-Learning.

In the open-ended portion to this question, in which a participant could select 'Other', one learner indicated that an online course is not recognized. This could be in reference to degrees obtained purely online, which carry very little weight with prospective employers (especially true in this region, where online degrees are seen as inferior). The same sentiments are sometimes shared by learners regardless of their origin based on studies by other researchers, for example some are suspicious of online education because courses are often offered by divisions of extended studies or continuing education (Husmann & Miller, 2003 in Yang & Cornelius, 2005), and are taught by adjunct faculty or instructors who have not earned doctoral degrees. However this is not usually an issue in the corporate environment, as courses serve a purpose to merely train the participant.

It was discovered that an important additional weakness identified in the interview data was the difficulties of communicating with a professor or instructor. As interviewee 1 pointed out:

> There was no face to face interaction. Sometimes when you have questions to ask, you can't ask.
>
> - Interviewee 1

Vonderwill (2003), in Song et al. (2004), reported that participants in an online course felt that there was a lack of connection, especially a one-on-one relationship with the instructor. Woods (2002), in Song et al. (2004) also reported that online learners felt isolated from faculty. One participant in the one-on-one interview suggested adding an instant messaging (IM) system within the learning module to enable communications with the instructor, as mentioned by interviewee 3:

> I would suggest adding instant messaging service (IM) [to the STEP procedure] so that I can ask questions.

> - Interviewee 3

However, the online training in Office 2007 using the STEP procedure was intended to be a standalone online training program. Adding an instant messaging service, although it might seem like an ideal method of enhancing this course, would be quite difficult to accomplish and unnecessary in a corporate environment. Lehtinen (2003) in De Corte et. al (2003) argues that pedagogical approaches used are more important than the technical features of the applied technology. The STEP procedure has no new technical feature built into it, but instead focuses on the design and delivery of e-Learning and not the technology used to build the courses.

When a cross-tabulation between gender against the figure 4.0 was applied, the major differences were that 57.1% of females found online courses to be boring or they got easily distracted, whereas only 28.6% of males found online courses to be boring or that they got easily distracted. No other significant differences were observed between the two genders. More than twice as many females as males found online courses to be boring. This is something that needs to be researched further to study if this finding can be generalized more widely and, if so, to explore the reason for such a significant difference.

5.1.2 Weaknesses of an Instructor-Led Course

The key perceived weaknesses identified by the survey in figure 5.0 were that learners found instructor led courses to be boring and long. The reason for this question to be asked in the survey is to analyze the difference between an online course and an instructor led course and their perception.

As seen in table 3.0, responses based on the weaknesses of an online versus a traditional instructor-led course using the same variables were compared and the following were observed:

When comparing the differences between an instructor led course and an online course, the key differences found were that there was a significant increase in the percentages of learners who felt that they become more distracted or bored in a traditional face-to-face course and when asked if the courses felt too long. The reason for a difference of 24.9% between an online and instructor-led course when asked if they felt they become distracted and bored or the 28.8% difference where the students found instructor led courses to be longer, could possibly be due to the fact that should a learner become bored or distracted in an online course or feels that the course has been going on too long, he or she can stop

the course and resume it at a later point in time, when their mood has perhaps changed. Of the learners surveyed, 83.3% did indicate that they have control over their learning in an online course.

5.1.3 Strength of Online and Instructor-Led Course

As one would expect, a majority of the participants did indicate that flexibility is a major strength of an online course when compared to an instructor-led course. The strength of an instructor led course was that it can accommodate a disability. Comparing the two tables revealed the following as seen in table 4.0 was that a vast 91.2% increase was noticed when participants were asked about the flexibility of an online course versus a traditional instructor-led course. Students were informed that flexibility involves time, location, work, family commitments, etc. This is in line with previous research in the field. For example, this type of instruction is perceived as a major breakthrough in teaching and learning because it facilitates the exchange of information and expertise while providing opportunities for all types of learners in distant or disadvantaged locations (Hill, 1997; Webster& Hackey, 1997, in Johnson et al. 2000). Enockson (1997) in Johnson et al. (2000), assessed distance education in a university setting and found that students were satisfied with online instruction because of its flexibility and responsiveness to their learning requirements and expectations.

However, it was surprising to note that there was a decline of 19.6% between the ability to accommodate a disability between the online course and the instructor-led course as seen in table 4.0 This could be due to the fact that in an instructor-led course, there is a human element behind it. An instructor is usually more than willing to accommodate any disability; for example, should there be a student that would require additional time to complete a task in a traditional course (for example if a student is a slow reader), the instructor could easily grant the additional time. However, if a task online is time tested, and should a student face a temporary disability, the opportunity to address the issue is immediately unavailable. However, when talking about disability that involves physical disability such as a learner confined to a wheelchair, then perhaps web-based courses would be better suited. The question should have been reworded to include types of disabilities to reflect the different situations described above. The outcome might have been different if this were expanded to include all possible types of disabilities. This area could be studied in future research.

It was also observed from table 4.0, that there was an increase of 27.7% (from 8.7% to 36.4%) in positive responses to the question of whether instructor-led or online courses were deemed easier. This observation indicates that students do perceive online learning to be harder. While this finding was reached at the end of all data analysis (and thus was not explored in the interviews) it would be interesting for further research to explore if 'harder' is perceived as higher quality or simply more challenging than traditional face-to-face courses because of the way online courses are currently built. Hislop (1999) found in his research conducted at Drexel University that 40% of the students felt they had to work harder in an online course than a traditional class. An assumption will be made at this point that one of the reasons online courses are perceived to be harder is that the design and presentation of online courses available in the market place today are of poor standard, and therefore there is a need for a complete overhaul of the way online courses are designed and built to address this issue.

5.2 Investigating the students Thoughts, Ideas and Concerns on the STEP Procedure

5.2.1 Ease of Use

In the post-survey, which was given to the participants after the online training using the STEP procedure, all participants (100%) either agreed or strongly agreed when asked if the training was easy to use as seen in table 5.0. This is an indication that the design of the site, along with the way the courses were structured, designed, developed and presented were looked upon favorably by the participants, just as interviewee 4 concluded:

> I learned a lot about Office 2007. The quiz was easy after taking the training. When I did not understand anything, I was able to pause the video and watch it again. The layout was nice and easy to use.

> - Interviewee 4

When a cross-tabulation was conducted between the participants who perceived the STEP training to be fun and those who found the training easy to use as indicated in table 10.0, a strong relationship was observed between those who found the online training in Office 2007 using the STEP procedure to be easy and those who found it to be fun because when learners perceive something to be fun, they have an engaging learning experience (Packer, 2006). This means that the design being easy to use enhances the learning experience.

5.2.2 Design and Presentation

As seen from Figure 8.0, when asked to rate their learning experience based on their recent experience using the STEP procedure when learning Office 2007, learners were very pleased with the presentation style, the design of the website containing the learning materials and the ease of locating materials.

A majority of the learners agreed that they liked the look and feel (layout) of the training and understood the materials better because of the way it was designed and presented. This is a strong indication that the manner in which the website and the courses were built and designed should be maintained. Cole (2000) in Anderson (2004) states that learning materials must be designed properly to engage the learner and promote learning. Savenye, et al, (2001) states that organization is critical in an online course, as learners have little opportunity to clarify directions. This indicates that the design and delivery of the course was easy to follow. However, when the one-on-one interviews were conducted, two interviewees indicated that they would have preferred to see more multimedia-based graphics that would enhance the simple design featured on the website, just as interviewee 1 pointed out:

> The design is not so attractive. Add more multimedia to make the page more attractive.

> - Interviewee 1

And interviewee 2 mentioned that:

The design is simple but not attractive. It was easy to use, but too simple looking.

- Interviewee 2

The reason why the researcher has kept the website hosting the STEP procedure simple is to avoid the design flaws of e-learning courses that exist today in the marketplace in accordance to the recommendations by Fong et. al. (2003), where they discuss the various human computer interaction (HCI) principles in design and the implementation of workflow based e-Learning by listing ten basic principles that drive design. A simple design gives the perception of stability, along with the consistency needed by the learner.

A cross-tabulation was performed to see if those who liked the design and presentation also perceived learning in Office 2007 using the STEP procedure to be fun. As seen in table 9.0, in chapter 4 a strong relationship was found between those who had a good experience locating the online training materials and those who found learning to be fun overall. A strong relationship was found between those who liked the design of the website hosting the learning materials and those who found learning to be fun overall. The results also showed a strong relationship between those who liked the presentation style of the STEP procedure and those who found learning to be fun overall. The cross tabulation revealed that when an e-Learning presentation style, the design of the website containing the learning materials and the ease of locating materials are liked by the participants, they then perceive their overall learning experience to be fun.

Overall, the participants seemed very pleased with the design and presentation using the STEP procedure The STEP procedures presentation style, design of the website hosting the learning materials and the clear order of how the materials are presented should be maintained. The layout of the STEP procedure can be observed in diagram 1.0

5.2.3 Reactions to STEP

According to table 6.0, all the learners felt positive about their learning experience. When asked if they still prefer face to face learning, a majority of the respondents choose to remain neutral. Reasons for this can be due to what was discussed below in section 5.2.3.3. All the learners also indicated that they understand the materials better because of the way the course was designed and presented. Learners also indicated that they liked to be assessed after each learning module. Simulations are used to immediately assess a student's understanding and allowed them to practice what they have learned and is further discussed below.

A cross-tabulation was conducted between the participants who perceived the STEP training to be fun and those who found felt positive about their learning experience on the day of the training as indicated in table 11.0, a strong relationship was observed between those who felt positive about their experience after taking the online training in Office 2007 using the STEP procedure and those who found it to be fun. This means that the fact that they had a positive learning experience and found it to be fun means that they had an enhancing learning experience.

5.2.3.1 The use of Simulations

An overwhelming majority of students felt that the simulations within the STEP procedure helped them to practice what they observed in the videos. The learning materials are reinforced through the guided simulations. As interviewees 6 and 1 said:

> I like that I can retake the simulations as many times as I want and if I get something wrong, It shows me the right answer.
>
> - Interviewee 6
>
> The simulation was quite clear.
>
> - Interviewee 1

The built-in simulations within the STEP procedure address one of the problems that occurs in online courses as identified by Jona (2000), which is that most online courses do not make a real attempt for learners to practice skills or apply their knowledge. It is also evident from the pre- and post-test scores that learning did occur, which will be discussed below.

Students were asked if they felt the simulations were too short, and a majority choose to remain neutral. The STEP procedure contains many simulations that correspond to the videos. It usually kept short as the learning objective can usually be covered through a short simulation in the STEP procedure. After the students have watched all the videos and tried a majority of the simulations, a final simulation is available to the learners. This simulation is usually longer as it incorporates everything they have learned in that module. This simulation is marked as 'overview' and can be seen in diagram 1.0

5.2.3.2 Control over Learning

When asked if they felt they had more control over their learning, 83.3% agreed. This is because of the way the STEP training is designed, such that the users can read the description of the intended module, click on any link that they wish, pause any video, try the simulations several times, and take the quizzes whenever they wish, until they have mastered a component and feel that they can move on. This is in accordance to Stephenson (2001), who states that one of the major features for a good design of online learning is being able to structure the course and design the materials to enable the learner to exercise a degree of control.

5.2.3.3 Peer Interaction

Students did indicate that they missed the interaction with other students when attempting the online training (44.5%), while only a smaller portion indicated that they did not, despite all of them being in the same room during the investigation. Since the online course in Office 2007 using the STEP procedure was intended as a standalone course, interaction with each other, even if they are in the same room was not built into the process (for example learners working in teams or peer discussions); therefore, peer

interaction at this point is not a goal of the STEP procedure as it usually will not work in a corporate environment.

Since the average age of the students was approximately 24 and a majority had not taken an online course in the previous three years, they were perhaps used to the traditional instructor-led course, and therefore it is understandable that they would miss peer interactions. Should the audience have been mature adult learners with prior online experience, they would have perhaps judged the STEP procedure against their own online learning experience and the results may differ. Future research should be done on adult learners in the corporate sector who lead a busy lifestyle to see if the group would also indicate that they miss peer interaction in an online course.

'A student's physical presence in a face-to-face course assumes that she or he has a sense of belonging to the class or group of students enrolled in the course. He or she listens to the discussion and may chose to raise a hand to comment, to answer or to ask a question. Furthermore, this same student may develop a relationship with other students in the class and discuss topics related to the class during a break, at the water fountain, or in the cafeteria. However, this is an assumption and not always true. For a variety of reasons, some students can also feel alienated in a face-to-face class and not feel part of a group' (Picciano, 2002). Picciano (2002) further states that the very definition of the word 'presence' is debatable. He states that online presence can have peer and instructor interactions, minus the physical contact. Are the students then missing only the physical contact? In an online setting, the concept of communities, which give a sense of presence, are still evolving. Picciano's research also found that student perception of social presence did not have a statistically significant relationship to performance on the examination. This means that even if they miss peer interactions, their ability to do well in an online course is unaffected. This is one of the major goals of the STEP procedure. However interviewee 2 did note the following:

> It was very simple to use [Office 2007 Step Training]. It improved my knowledge in Office 2007 but there was one thing I could not understand and had no opportunity to seek clarifications.

> - Interviewee 2

And yet another interviewee also indicated the following:

> I think there are people in the training who are always late and as a result, disrupt the training.

> - Interviewee 1

Both these students initially scored 80% in the pretest, and then scored 100% in the post-test, so therefore, their ability to do well was unaffected, despite the fact that interviewee 2 had some trouble understanding something in the online training but could not seek further clarification. This is in-line with Picciano's findings.

5.2.3.4 Learning Comprehension

All the participants indicated that they understood the materials better because of the way the course was designed and presented. This is an indicated that students learn better when it is designed and presented well. As seen in table 12.0, a strong correlation was observed between those who understood all the learning materials and those who thought learning using the STEP procedure was fun. This means that the fact that they understood all the learning materials because of the way the course was designed and presented and found it to be fun means that they had an enhancing learning experience.

5.2.4 Overall Experience using STEP

Participants were again asked to rate their overall experience using the STEP procedure, and all participants selected either extremely good or good. The overall experience includes the aesthetics, the load time of the page, the online course, the delivery, design and more.

5.2.5 Learners' Recommend STEP

According to table 8.0, when participants were asked if they would recommend future training to follow similar presentation and delivery on a scale of 1 (absolutely not) to 5 (most certainly), the average score was 3.5, which was weighted towards yes, that they would recommend future online learning to follow the STEP procedure. This is a positive indication that the STEP procedure was looked upon favorably, as commented by interviewee 2 and interviewee 3:

> Even without an instructor, I felt it helped me understand Office 2007 better.
>
> - Interviewee 2

> If my current face to face training was made available to us at home (like the Office 2007 training), I would like it because it would be more convenient, because I travel very far for the training.
>
> - Interviewee 3

Learners enjoyed their experience using the STEP procedure as they felt positive about their learning experience, liked the way they were assessed after each learning module, found the simulations to be useful, felt they had control over their learning, looked at the layout favourably, felt they understood the materials better because of the course design and presentation, understood all the learning materials presented to them and thought learning this way was fun, hence for these reasons, the learner indicated that they would recommend future training to use the STEP procedure in their course design and presentation.

5.3 Studying the 'Effects' of the Online Training Using the STEP Procedure

Table 2.0 shows the average score of the participants prior to taking the online training in Office 2007 (that is, the test was given before the program started) was 68.33 out of a possible score of 100. The average score of the same group on the post-test (the same test was given at the conclusion of the program) was 95.79—a net gain of 27.46. All of the participants (100%) passed in the post-test, just as Interviewee 4 pointed out:

> You can learn by yourself and no one will disturb you when you face the computer and watch the video clips. The information was clear to me and I understood everything. If I did not understand something, I can repeat it. I scored 70 in the pre test and 100 in the post test.
> - Interviewee 4

Literature review has revealed that e-Learning is very important to the corporate sector as Strother (2002) states that in addition to the obvious economic benefits, other advantages includes convenience, standardized delivery, self-paced learning, and variety of available content. Since research also shows that students perform on par if not better than traditional training methods, these are reasons for many corporations to make e-learning a high priority Other researchers who have conducted experiments to study the difference between online learners and instructor led courses, such as Navarro and Shoemaker, 1999 in Strother, (2002), reported that online students scored significantly better than traditional students where the mean scores for online students was 11.3 while the score for traditional learners was 9.8. Nelson, 2001 in Strother, (2002), who conducted such a study on 406 students at University of California Northridge reported a significant difference between the mean grades of students in online classes versus traditional courses. A similar study conducted at State University of New York at Oswego also noted a positive gain from the pretest to the post-test and confirmed the researcher's hypothesis that students learn as much from an online tutorial as they do from traditional in-class instruction (Nichols, Shaffer and Shockey, 2000). As interviewee 2 said in reference to the STEP training:

> Very convenient to use. I scored 80 in the pre test and 100 in the post test.
> - Interviewee 2

This comparison of total scores on the pretest and post-test is one method of measuring increased knowledge and/or changes in attitude according to Kirkpatrick (1996). Kirkpatrick further goes on to state that the evaluation is important for the following reason: to measure the effectiveness of the instructor in increasing knowledge and/or changing attitudes. He states that if little or no learning has taken place, little or no change in behavior can be expected

A word of caution here is that the increase in scores is in no way a study of effect. Studying the effects of the STEP procedure at such a small scale is not typically recommended, according to Andrews (2003). When pre- and post-test grades were analyzed, the raw scores by themselves are not a study of the effect of the STEP procedure. However, the results were used to evaluate the understanding of concepts that were emphasized through the use of the online training in Office 2007. This indicates that students' knowledge of Office 2007 prior to the training and after the training improved. Simply put, learning did occur.

The other results of the STEP procedure were that the participants truly enjoyed their overall experience and ranked the procedure as being either good or extremely good; would recommend future training to follow the STEP procedures when courses are planned, designed and built; felt they had control over their learning; understood the materials better because of the way the course was designed and presented; liked the way they were assessed; enjoyed practicing what they learnt by using the simulations; liked being assessed after each learning module; and thought it was a fun way to learn.

5.4 Limitations

"It would hardly be the fish that discovered the existence of water" (Kluckholn in Walcott, 1999)

As with any research, one cannot make a quick judgement based on qualitative research or observations. Data from these participants did provide some insights. However the limitations include:

1. Study participants were not randomly selected and therefore not representative of the general learner.

2. The researcher was seen as the designer and developer of the STEP procedure, and this might have influenced student responses to questionnaire and the interpretations of the data.

3. Some survey questions were designed with an assumption that the participants had previous work experience and had taken an online course previously.

4. The field work was carried out in a short time. It is unknown if the results would be affected should the field work be carried out several times using different learning modules in different topics using the STEP procedure.

It is important to remember that this study is a study on a selected group and overgeneralization is not possible, as with any qualitative research.

Chapter 6: Conclusion

In this study, the researcher investigated the difficulties and perceptions learners have on online training, their thoughts, ideas and concerns on the new design and presentation of an online learning module designed and developed using the STEP procedure and to study the effect of the STEP procedure in terms of learning gains and their reactions to the module.

Learner perception of online learning

It was found that learners felt that flexibility is the major strength of online learning. The weaknesses identified are that the courses contain irrelevant elements and they get bored or distracted when taking an online course. These weaknesses can be attributed to the poor design and presentation of current e-Learning available in the marketplace.

Design and Presentation using STEP

It was found that the presentation style, design of the website containing the learning materials and the ease of locating learning materials were found to be well received by the learners. Some learners did indicate that the design was too simple however the reasons for the simple designs were to give the perception of stability, along with the consistency needed by the learner. Students also indicated that they had full control over their learning and understood the materials better because of the way the course was designed and presented.

Test Scores

Learners took a pre-test prior to taking the course using the STEP procedure. After the training was concluded, learners then participated in the post-test. Learners scored very highly in the post test which is an indication that learning did occur.

Overall Impression

The learners overall experience using the STEP procedure was rated very highly and the participants indicated that they would recommend future online training to follow a similar presentation and delivery style.

The findings in this research study provided a good reason for instructional designers, instructors, e-Learning professionals and other stakeholders who have an interest in the way online courses are to be designed and built but have very little research evidence to inform their work, to follow the STEP procedures in their future implementations While scholarly research has revealed some suggestions about what constitutes good design, the way these ideas can be implemented in practice is still lacking. E-learning designers can now use the STEP procedure as a blueprint for their design and implementation.Subsequent studies and implementations should perhaps also seek learner input in the design of course activities and involve the adoption of strategies that will stimulate student engagement and allow learning to take place.

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Appendices