Investigating the Effectiveness of iPad Based Language Learning in the UAE Context

التحقيق في تأثير لغة التعليم المستندة على الآيباد في محيط دولة الإمارات العربية المتحدة

by

TSOGHIK GRIGORYAN

A thesis submitted in fulfillment

of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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ABSTRACT IN ENGLISH

This mixed-methods true experimental study aimed at exploring the results of using mobile technology educationally by looking into learner practices and attitudes toward using iPads in language learning, as well as looking into students' language achievement that the paperless classroom developed. Four research questions guided this study. The quantitative analysis were obtained through the test scores and survey questionnaires to answer the first three research questions. The qualitative analysis were obtained through teachers' weekly reflective journals to answer the forth research question.

The experimental results revealed that level one language learners progress in learning English better when using iPads as compared to using textbooks. That is to say, according to the experimental results of this study, the paperless classroom is better suited for language learning purposes. The experimental phase results were well supported by the results of the survey analysis, which showed a positive relationship between students' attitudes toward iPad implementation as a means of language learning and their language achievement. Not only the experimental and survey results showed that iPad based language learning is more productive than textbook based language learning, but also the reflective journal analysis, according to what, the interactive learning environment in both phases triggered quite a high level of student motivation and language achievement.

ABSTRACT IN ARABIC

هذه دراسة تجريبية حقيقية لأساليب المختلطة تهدف إلى استكشاف نتائج استخدام التكنولوجيا التعليمية المتنقلة من خلال النظر إلى ممارسات المتعلم وموقفه اتجاه استخدام الآيباد في تعلم اللغة، وكذلك النظر في التحقيق اللغوي لدى الطالب في الفصول المتطورة الغير ورقية. تستند هذه الدراسة إلى أربعة أسئلة بحثية. وقد تم الحصول على التحليل الكمي من خلال نتائج الاختبارات والاستبيانات للرد على أول ثلاثة أسئلة بحثية. وقد تم الحصول على التحليل النوعي من خلال الكتابات التأملية الأسبوعية للمعلمين للرد على السؤال البحثي الرابع.

وكشفت النتائج التجريبية أن متعلمين اللغة في المستوى الأول تقدمت بشكل أفضل في تعلم اللغة الإنجليزية عند استخدامهم جهاز الآيباد مقارنةً باستخدامهم للكتب المدرسية. وهذا يشير إلى، توافق النتائج التجريبية لهذه الدراسة، وأن الفصول الدراسية اللاورقية أفضل ملائمة لأغراض تعلم اللغة. فكانت نتائج المرحلة التجريبية دعمًا جيدًا من خلال نتائج تحليل الاستبانات، والتي أظهرت العلاقة الإيجابية بين اتجاهات الطلبة نحو تطبيق الآيباد كوسيلة لتعلم اللغة وتحقيق اللغة. وليست فقط النتائج التجريبية والاستبانات التي أظهرت أن تعلم اللغة المستندة على الآيباد أكثر إنتاجية من تعلم اللغة المستندة على الكتب المدرسية، ولكن أيضًا تحليل الكتابات التأملية، وفقًا لما أدت إليه البيئة التعليمية من تفاعل تام في كلتا المرحلتين إلى مستوى عال من تحفيز الطلاب وتحقيق اللغة.

DEDICATION

With deepest thanks,
this dissertation is dedicated to my parents,
my husband, my three children, and
to my brother for their
assistance, encouragement,
love and support.

ACKNOWLEDGMENTS

Given as time-consuming and multi-faceted as a doctoral thesis, it is hard to adequately express the gratitude owed to scholars, friends and family who supported me throughout this journey.

First of all, I would like to thank my supervisor Dr. John McKenny for his painstaking and unstinting effort, highly valuable guidance and support in putting the pieces of this thesis together. I would also specially thank my program chair Douglas Henderson for his guidance and support, as well as all the teachers and students involved in this study. I owe a debt of gratitude to my friend and colleague Anita Dani for so many meetings directed to the discussion of the quantitative analysis of this thesis. Additionally, I owe a sincere thanks to my friend Hinda Hussein for her continuous support and inspiration. A big thank you goes to my wonderful colleague Hajar Al Nuaimi for helping me deal with the Arabic language sections of this thesis.

I would like to express my most honest and deepest gratitude to my family who has offered me their patience, encouragement and support to peruse with my learning and reach my personal and professional goals.

Table of Contents

Chapter One
Introduction

This introductory chapter provides the background to the present research study and addresses the research problems and research questions. It provides a brief overview of the research methodology along with a diagrammatic representation of the structure of this thesis.

This thesis is an investigation of iPad based language learning in the UAE context. The use of mobile technology in education has become prevalent around the world, as well as in the UAE. This innovation is defined as "a persisting change in human performance or performance potential … as a result of the learner's experience and interaction with the world" (Driscoll, 2005, p. 9). The contemporary view of how the learning process changes and revolutionizes with the help of mobile technology can affect decision making about educational policies. If one considers learning to be under the control of teachers in traditional teaching methods, believing that 'teaching equals learning', it is entirely reasonable to support polices that make teachers directly accountable for student test results (Januszewski and Molenda 2010). However, the assumption 'if teachers work harder learners will learn better' is viewed differently when a constructivist observation is put forward, looking at learning as being largely under the control of learners, where teachers and students are viewed as collaborators. Here is when the third party in a form of the mediating tool is needed to infer educational policies to focus on student motivation to achieve and progress through their studies. That mediating tool could be a mobile technology that facilitates learning and improves performance. "I believe digital technology can be used to make learners not just smarter but truly wiser" (Thomas 2011, p. 18).

In our days the world is moving toward digital enhancement, which means digital enhancement will be available for just about everything people do. That is to say, digital and mobile devices already enhance people's cognitive competences in many ways, such as memory, decision making or problem solving. To explain it better, digital tools improve our memory through data input and output as well as electronic storage (Thomas 2011). Other tools, such as digital data gathering or decision making tools develop our decision making, problem solving and analytical thinking skills by letting us search in seconds, choose the needed information and collect more data than we could have done unaided, helping us multitask and carry out quick and

complex analyses. Hence, it must be stated, that digital enhancement of people's cognition supported by mobile technologies and digital tools is a reality in every profession and every field today. However, it should not be assumed that the human brain is no longer significant and that mobile technology is smarter by itself. Quite the opposite, "It is through the interaction of the human mind and digital technology that the digitally wise person is coming to be" (Thomas 2011, p. 27). The time we live in necessitates the urge to educate digitally smart students and teachers, to embrace digital enhancement in the field of education and encourage others to do so. "With our eyes wide open to enhancement's potential harm as well as its benefits, let us bring our colleagues, students, teachers, parents, and peers to the digital wisdom of the twenty-first century" (p. 27).

Prensky (2012) has identified today's generational change that leads to a really big discontinuity, which one can call 'singularity' _ an event that changes things so fundamentally that there is no way back. He has used the term "Digital Natives" and argued that the new generation are different from the previous generations because of the technological changes. Therefore, it will be easier and more productive to meet today's "Digital Native" students in their comfort zone and use the digital technology in teaching to achieve significant progress. As Solomon and Schrum (2007) state, "The competition will be fierce and can come from anywhere in this flat world. In some ways, students today are ahead of their elders. Technology is second nature to them and they accept and use it without question. Schools lag behind" (p. 17).

Prensky's (2001) ideas about digital natives and digital immigrants were published more than ten years ago, according to which a new generation of digital natives are presently entering the schools and other educational institutions. The urge for educators to accept the needs of this generation differently has become even more crucial. The educational systems try to implement new innovative projects and take new initiatives without excluding the outdated practices, which prevents the educational system from embracing the future and meeting the demands of the new generation. Another fundamental problem raised by Prensky (2001) about today's educational system in the eyes of the new generation regards the absolute boredom in schools, which he explains with the promptly growing divide between the information and knowledge learners can get out of school and the narrow confines of their lives within it.

Games and interactive activities are put forward when preparing students for interactive learning. Those activities are realized through mobile devices which in many cases are thought of as toys by many teachers and parents, who think of it as a waste of time or merely a pastime. It must be mentioned that toys have neither objectives nor goals unless played to win. Achieving a goal is what motivates students and develops skills, such as imagining a future state, devising strategies, analyzing the ways of achieving the goal, thinking critically, problem-solving and processing it. Every game has a goal to reach and strong ways to engage learners in interactive learning. Challenge, conflict and competition are the components present in basically all games, but they do not necessarily have to be against other players or learners in educational setting. It can be a puzzle to solve, a story to create or a piece to read in a set time. Though some learners are shy of conflicts or do not like competitions, they like challenges, especially when they get a chance to choose the level of difficulty and fix a time for the intended task. Games can be educational and represent a wide variety of themes and topics. Putting content in them that is vital in the real world is what digital game-based learning is all about (Prensky, 2001). So as soon as the goal is put into the activity the toy is easily turned into a game, which allows seeing the mobile device as a means of learning, an interactive tool and a powerful device to motivate learning.

What causes the traditional teaching methods to no longer apply is not just constant innovations but the urge to address today's students' needs and prepare them for the challenges of this constantly changing world. Those changes present teachers with new situations where new methods are required, hence, with new solutions for finding them. If those methods lie in finding useful solutions, those solutions will be rapidly changing. For instance, it used to be a norm to assign to memorize information at school to keep students going and help them for the rest of their life. Today, it is better to teach how to acquire new information and develop learning skills. It used to be better to calculate on paper and not allow calculators during examinations. Today, students take tests by the help of computers, calculators and other mobile devices. It used to be common for employers to promote and keep their employees as long as possible since they knew the company in-and-out. Today, it is better to hire new employees and fresh graduates having new skills and knowledge to work with technologies and those who are in tune with mobile devices. While many teachers resist the changes, as well as challenges, and wish to bring

back the old good times, it is simply impossible. So, a new guidance and new skills are needed on what is practical in our times that takes mobile technology into account.

The history of learning, particularly language learning, is rich with various related theories and novelties for the time. The establishment of digital schools has a track in educational technology. Back in 1940s, Dale (1946) thought about 'rich experiences' and based his audiovisual pedagogy on it. Leonard (1968), as well, saw the school of the future as a learner-centered and open environment, where each student would have an individual educational plan and study in interpersonal, intrapersonal, kinesthetic and other domains. Gardner (1983) presented his theory of multiple intelligence, according to which technology could facilitate learning in each intelligence area. The belief in the equivalence of human thinking and learning vs. technological functioning was closely linked to epistemological notions of 'knowledge' as a group of elements that, like 'if-then' rules, could be mechanically processed through signs, symbols and production mechanisms. It can be foreseen that upcoming modern theories of learning will similarly tend to meet the challenges and demands of the knowledge society and look at learning as a coding and retrieving practice about conceptual notions and artefacts.

The traditional teaching methods, where teachers talk through textbooks and students listen are regarded as an old practice not providing students with the skills they need for the modern world (Jukes, McCain and Lee 2010). However, it is necessary to notice that several skills that traditional methods developed are still needed. Raising the need to implement modern ways of teaching does not mean to forget and disregard the old practices. It is by no means 'either-or' situation and needs more research and investigation in the field. While teachers continue to teach many traditional skills, there will be a shift in emphasis of importance of those skills (Jukes, McCain and Lee 2010, p.63). There was a time when it was important to learn to write nicely and develop a good handwriting. Despite the cognitive benefits of practicing nice handwriting, its emphasis as an important skill has changed significantly. Learning has moved to a digital realm and writing is realized using digital software tools. This is only one example out of many possible ones that restates the importance of re-evaluating teaching and learning ways in light of the realities of the new digital world. Teachers no longer have to be in the center of attention, but become facilitators who guide the learners to the answers they search for. Since there are no fixed right or wrong ways of integrating technology into the classroom, the solution

is to come up with the most effective learning environment for learners. This turns out to be a gap in the knowledge regarding the ways and methods teachers teach and learners learn paperless in technologically enhanced paperless classroom.

This makes it obvious that the description and understanding of the learning has changed significantly over time and is still in its transformational modern stage, which necessitates exploration and investigation of the pros and cons of innovative changes in the field of English as a Foreign Language (EFL henceforth) paperless classroom. "This paperless system clears the way for communication beyond the space and time limitations inherent in any traditional course" (Dan 2002, p.162). The move to paperless classroom is met mostly with fear and resistance to change by educators. However, it is hard to believe that the new generation of learners would ever argue against paperless learning. The time has come to retire printers and copiers to the museum (Vernon 2011). Teachers are facing a tough time moving to touchscreens, just as they faced trepidation about moving from blackboards to smart-boards and typewriters to keyboards. Changes and challenges are not easy, but they are unescapable and need time to research the advantages and disadvantages they could bring to today's educational system.

An example of this change was a tertiary level college in the United Arab Emirates that went paperless in 2012 and implemented iPads for its Foundations Program, eliminating paper and pen teaching-learning methods from the classroom. The Foundations program consisted of four levels of English proficiency groups and was designed to improve Emirati EFL students' English language proficiency skills. The innovation brought up enormous challenges in the technical and methodological fields, as well as in language learning ways, skills and practices. As Malopinsky and Osman (2006) mention, "Change is highly complex; it is rarely unidimensional or unidirectional and can come from inside the organization as a result of an internally identified need" (p.39). Therefore, to avoid confusion, it is highly important to ensure an organized and predictable transition from one state to another (Januszewski and Molenda 2010), which the institution successfully realized through various professional development events and activities. However, different teaching and learning practices brought up anticipated and unanticipated challenges that needed immediate interference and examination. Therefore, research and investigation were needed to shed light on pros and cons of various aspects of that innovative change.

This mixed-method study aimed at exploring the results of using mobile technology educationally by looking into learner practices and attitudes toward using iPads in language learning, as well as looking into students' language achievement that the paperless classroom developed. The research questions guiding this study were the following:

1. *Is there a relationship between classes taught through iPads and beginner level Emirati students' language achievement?*
2. *What are beginner level Emirati students' attitudes toward iPad implementation as a language-learning tool in terms of learner satisfaction, motivation, perceived tool usefulness and learning effectiveness?*
3. *Is there a relationship between beginner level Emirati students' attitudes toward iPad implementation as a means of language learning and their language achievement?*
4. *What are the emerging themes of the teachers' reflective journals in the evaluation of their lessons and diagnosis of problems?*

The purpose of this study was to investigate Emirati level one (false beginner) English language learners' perceptions of iPad use as a means of language learning tool and assess its impact on learners' language achievement. The first, second and third research problems were answered through quantitative paradigm as they required the measurement of variables and their effects on the outcome. The forth research question was answered through the qualitative paradigm. The diagrammatic representation of the thesis structure in Figure 1 details the three phases of this study: two experimental phases, after each of which survey questionnaire was administered and phase three, during which weekly reflective journals were written by the teachers teaching the groups.

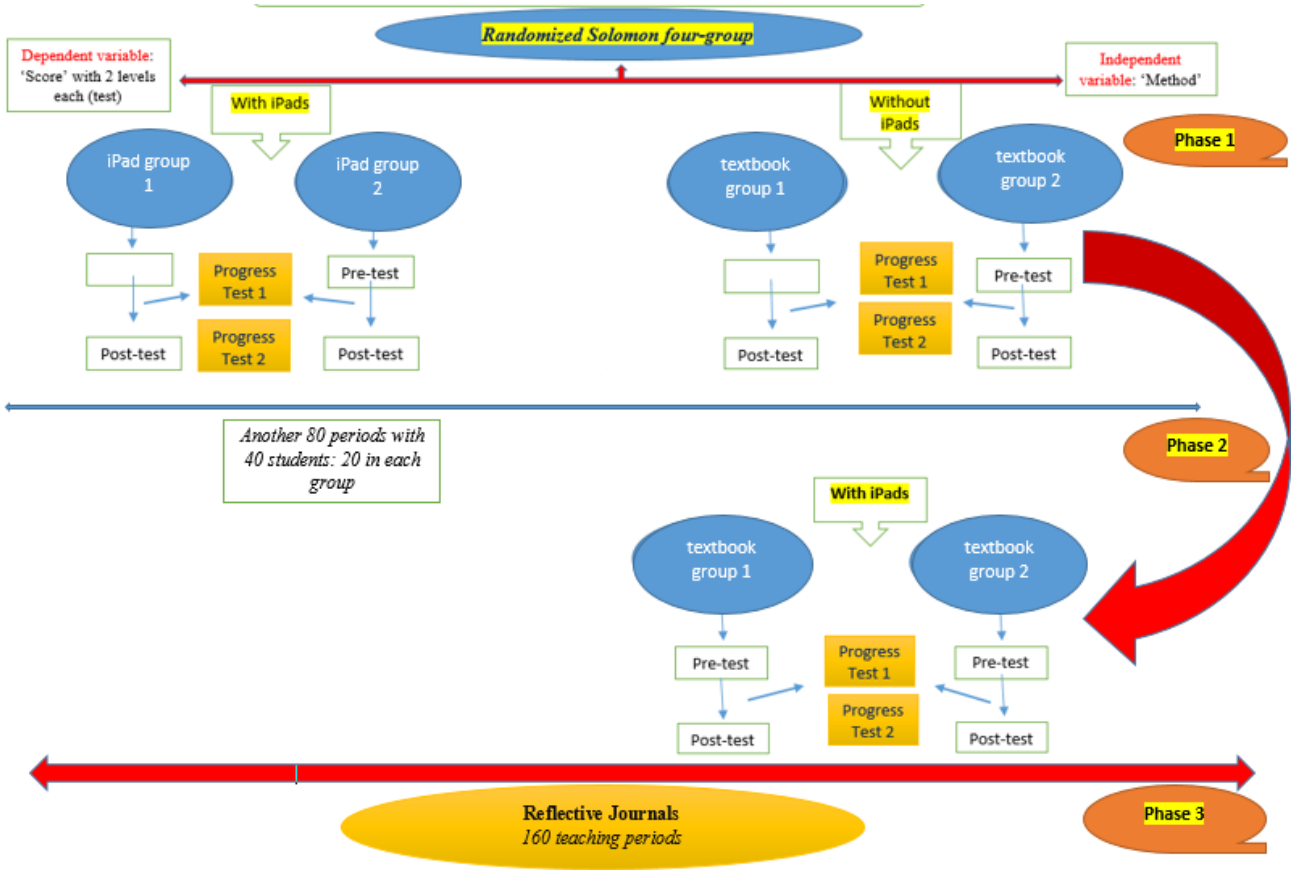


Figure 1.1: Diagrammatic representation of the thesis structure

The experimental design was thought to be the best fit to answer the research questions one and three, since it allowed to manipulate the independent variable and was the best type for testing hypotheses about cause and effect relationships. Out of all experimental designs, this study chose to be a true experimental, since the subjects were randomly chosen and assigned to treatment groups. As shown in Figure 1, the experimental phase was conducted through the Randomized Solomon Four-Group design, which required random allocation of students to four groups: two groups being taught through iPads and two with textbooks. Therefore, the groups that used iPads for their language learning were called *iPad groups* and the groups that used paperback textbooks for their language learning were called *textbook groups*. The groups were homogeneous since the participant students belonged to the same gender, age group, nationality and joined the institution having the same Common Educational Proficiency Assessment (CEPA) scores. All four groups followed the institution's Common Course Outline, meaning,

they followed the same plan and covered the same material. The difference in treatment was that, the iPad groups studied the same textbook units through the electronic interactive textbook and used iPad applications for extra materials, whereas, the textbook groups studied the units through paperback textbook and used worksheets and teacher-made materials as extra activities. The experiment ran through two phases, each phase lasting 80 teaching periods. During each experimental phase students produced a pre-test and a post-test, as well as two progress tests. After each experimental phase a cross-sectional self-completion fixed-design questionnaire survey was administered to answer the research questions two and three. The qualitative analysis were obtained through weekly reflective journal logs that the four teachers teaching the four groups kept to record the procedure of the experiment for all four groups during phase one, and three of the experiment. The descriptive journals were standardized through team meetings and contained information about 160 teaching periods throughout two phases. This phase assisted in between-method triangulation and helped answer the forth research question.

The experimental results revealed that level one language learners progress in learning English better when using iPads as compared to using textbooks. That is to say, according to the experimental results of this study, the paperless classroom is better suited for language learning purposes. The experimental phase results were well supported by the results of the survey analysis, which showed a positive relationship between students' attitudes toward iPad implementation as a means of language learning and their language achievement. Not only the experimental and survey results showed that iPad based language learning is more productive than textbook based language learning, but also the reflective journal analysis, according to what, the interactive learning environment in both phases triggered quite a high level of student motivation and language achievement.

Several studies have been published on iPad implementation in the field of education (Hung, Sun and Yu 2015; Butcher 2014; Saudelli and Ciampa 2014; Sullivan 2013). However, there are limited studies conducted in the EFL field in the UAE context (Gitsaki and Robby 2014; Gitsaki, Robby, Priest, Hamdan and Ben-Chabane 2013). Therefore, it is hoped that this study has contributed to the growing field of iPad based language learning in the UAE higher education.

Chapter Two

Literature Review

This Chapter firstly presents an overview of the approaches used to examine the process and effects of introducing new teaching methods into the educational system. Secondly, it discusses recent research studies and practices of technology use in the field of education. It then presents the Activity Theory (AT henceforth) as a framework for this study and moves on to discuss the AT from its digital perspective. Lastly, this chapter concentrates on the AT in studying technological innovations in the field of education and its theoretical implications.

2.1 Innovation Adoption Approaches

Theories and approaches related to innovation adoption include but are not limited to Diffusion of Innovation Theory (Rogers 2003), Theory of Reasoned Action (Fishbein and Ajzen 2010), Enhanced Technology Acceptance Model (Venkatesh and Davis 2000), Unified Theory of Acceptance and Use of Technology (Venkatesh and Davis 2000), Social Cognitive Theory (Bandura 1999) and Activity Theory (Engestrom 1999). Many other approaches have emerged and have been developed from the above mentioned models and theories to conduct research into technology-use. In turn they have been practiced in various spheres of life, as well as in education.

Diffusion of Innovation Theory	**Theory of Reasoned Action**	**Enhanced Technology Acceptance Model**	**Unified Theory of Acceptance and Use of Technology**	**Social Cognitive Theory**	**Activity Theory**
Flexible attitudes	• Beliefs • Attitudes	• Perceived ease of use • Perceived usefulness	• Performance expectancy • Effort expectancy	Self-efficacy	Perceived ease of use
• Comparability • Observability	Subjective Norm	• Subjective norm • Result demonstrability	Social influence Facilitating Conditions	Outcome expectations	Result demonstrability

Table 2.1: Summary of Innovation adoption theories

Though ICT adoption is a well-researched area of study in IT research, its application to education is still under investigation (Churchill and Wang 2014; Lai, Sham and Tian 2014; Meder and Wegner 2015). Some educational institutions today insist on integrating mobile devices without determining their benefits and possible negative effects on students' education. Funding, innovative ways of management, ecological problems, modern pedagogies, and other factors are all mentioned as hurdles for ICT adoption, yet the area lacks research and consensus (Meder and Wegner 2015).

Table 2.1 depicts six innovation adoption theories and discusses them accordingly. One of the approaches to the adoption of innovation that educational technologists will benefit greater understanding and awareness from is the diffusion of innovation theory. Diffusion of innovation theory explains how an idea or a product gains an impetus over time and diffuses through a specific population (Boczkowski 2010). It aims to study people's technology adoption in terms of time, innovation, communication methods and the social system. This means that people adopt an innovative product or a new idea and perceive it as new or innovative. Ghezzi, Rangone and Balocco (2013) claim that diffusion theory should be revisited to identify external determinants that enable or hinder evaluation of the new technology prior to the technological activation phase in education. The model they propose addresses regulation, environment, strategy and technology (REST), which are the four determinants stimulating technology activation.

Another theory that believes that the behavioural target is shaped by the individual's attitudes and subjective norms is the Theory of Reasoned Action (TRA). It was developed to describe the connection of individuals' behaviours and attitudes within their actions. "The aim of the TRA is to investigate the relationship between attitude and behaviour based on two major concepts: principles of compatibility and behavioural intention. With this characteristic, the TRA is a predictive model and, therefore, is used in a variety of fields, such as banking, public, education, and industries to predict individuals' actions based on certain criteria" (Mishra, Akman and Mishra 2014, p. 30). The attitude and subjective norm are the central factors of individuals' objectives of implementing ICTs and were found to have a big impact on adopting ICT (Mishra, Akman and Mishra 2014; Doane, Pearson and Kelley, 2014). Several studies found that subjective norm affects individual's behavioural intention (Cooke and French 2008; Doane,

Pearson and Kelley 2014), satisfaction, information sharing (Tsai, Chen and Chien 2012), and perceived usefulness (Venkatesh and Davis 2000).

The enhanced Technology Acceptance Model (TAM) suggests that perceived ease of use and perceived usefulness are direct channels of technology acceptance behaviours. As Gong, Xu and Yu (2004) define, "Perceived usefulness is defined as the prospective user's subjective probability that using a specific application system would increase his or her job performance within an organizational context" (p.366). Perceived ease of use, on the other hand, "refers to the degree to which the prospective user expects the target system to be free of effort" (p. 366). Several studies have used Enhanced Technology Acceptance Model as their theoretical background for explaining technology use and adoption (Cheung and Vogel 2013; Gong, Xu and Yu 2004; Teo 2009) and found that perceived usefulness influences attitudes and satisfaction toward technology use (Limayem, Hirt and Cheung 2007; Venkatesh and Davis 2000).

The Unified Theory of Acceptance and Use of Technology (UTAUT) looks at how two factors: intention and behaviour, progress over time and are moderated by gender, age and experience (Venkatesh and Davis 2000). The determinants of intention are supposed to be the performance expectancy, effort expectancy, and social influence, whereas, the determinants of behaviour are supposed to be the intention and facilitating conditions (Venkatesh and Davis 2000).

Social Cognitive Theory (SCT) describes how the individual obtains and sustains a specific behaviour based on learning from others (Bandura 1999). This theory suggests that the acquisition of knowledge is related to observing others within the context of social interactions. It also explains that a specific behaviour can be influenced by final expectations and self-efficacy, while final expectations and self-efficacy can be affected by prior behaviour. Several studies have used SCT and found significant relationships with other concepts in ICT adoption and use, such as that self-efficacy can positively influence perceived ease of use and perceived usefulness (Chiu, Hsu and Wang 2006; Swearer, Wang, Berry and Myers 2014; Bandura 2002).

Activity Theory (AT), as propounded in Soviet psychology, is the umbrella term for several eclectic social sciences theories. It is not a predictive theory, but more of a descriptive framework, which studies the whole activity system beyond one user. Since AT is the theoretical

framework of this study, it is described in more detail under the study's theoretical framework section.

2.2 Practices of technology use in the field of education

The purpose of this section is to review the recent practices of technology use in the field of education in the integration of mobile technology in the language classroom, as well as, learners' and teachers' attitudes towards using technology in teaching-learning process. An extensive literature search revealed that the teaching process through mobile devices has not been studied in a systematic manner. There is a gap in the knowledge regarding how students learn and teachers teach 'paperless' in a paperless classroom.

To review the studies, a table has been constructed to present summaries of the articles followed by their research questions (Table 2.2), which is then discussed in details in the text. The table presents fifteen studies published in the field of education in the integration of mobile technology in the language classroom. It presents the study together with its research questions and summarizes for further references. Another Table has been constructed to present the evaluation of them (Appendix C).

Study	Summary	Research question
1. A study of participatory action research as professional development for educators in areas of educational disadvantage	This mixed methodological study aimed at evaluating the efficacy of participatory action research methodology (a) as a tool to engage both administrators and teachers and (b) as a process of professional development through which to address issues of educational disadvantages. Interviews and focus groups with participants were used to collect data for qualitative analysis. The findings suggested that PAR allowed both administrators and teachers to engage in social and educational issues involved with homeless students and to develop specific practices to help them. (James 2006)	*What was the experience of educators with PAR process and why might PAR be a useful tool in addressing educational disadvantage?*
2. Technology integration in the schools of Guyana: A case study	This study aimed at exploring the impact of using learning technologies, specifically interactive radio instruction for teaching math and SuccessMaker software for enhancing literacy skills. 275 surveys, interviews, observations, focus groups and qualitative expert reports of classroom use of learning technologies were used as data collection methods. The study found that the SuccessMaker software was a great	*What are the impacts of, and associated challenges with, implementation of interactive radio instruction for teaching mathematics? What are the impacts of, and associated challenges*

	resource and students were enthusiastic to learn once that technology session was timetabled. (MacKinnon 2010)	*with, implementation of computers as teaching and learning tool?*
3. Devices and Educational Change	This paper explores 2 cases of device-mediated educational change. The first involves a computer-assisted interactive video module that provided 30m instruction for a university course. Interviews with admin. And professors, observations were used for data collection.	*To what extend did the use of technology facilitate a learning environment which encouraged collaboration and knowledge construction?*
4. Teachers' instructional scaffolding in an innovative information and communication technology-based history learning environment	The study aimed at examining how teachers with different conceptions of their teaching roles use different types of instructional scaffolding while working in an innovative learning environment. The study also aimed at investigating the role of instructional scaffolding in different types of learning activities following Vygotsky's theory. The class process was video and audiotaped, teachers and students were interviewed and questionnaires were administered before and after the study for data collection. The results showed that teachers with different conceptions of their role demonstrated differences in the nature of their instructional activities. (Rasku-Puttonen, Etelapelto, Hakkinen and Arvaja 2006)	*How are associations among people and things accomplished? Do associations come slowly allowing different kinds of users at different stages as a device takes form or do commitments come together all at once?*
5. Teachers' feelings during curriculum change in the UAE: opening Pandora's box	This qualitative exploratory interpretive study attempted to understand teachers' perceptions of curriculum change in the UAE. The study looked at innovations that took place in textbooks used in grades 10 through 12. The teachers didn't have the official curriculum but only the introduction and contents sections of the main textbook. The curriculum change model was top down with almost no chance for teachers to play any active role. Data collection methods included repeated face-to-face semi-structured, group interviews and document reviews. The data revealed that participants had contradictory affective reactions to curriculum change since they approved of some aspects of change but were disturbed by other aspects. (Troudi and Alwan 2010)	*What do English language teachers understand by 'curriculum' in the UAE context? How do the teachers feel about the curriculum change in the UAE context?*
6. The paradox of IT in primary schools: E-learning is new but gender patterns are old!	This ethnographic case study aimed at examining the ways teachers experience IT as "solution" or "frustration" in developing their professional knowledge in one school. Interviews and observations were used as methods of data collection. The study showed that in that school It is used as a creative tool. It also showed that women teachers found it more difficult than men to use IT into their practice. (Hellsten 2007)	*Are there differences between the sexes regarding teacher's ways of adopting IT? Are there social or cultural factors other than gender which affect teachers' IT use and attitudes towards computers?*

7. Teacher professional development for technology integration in a primary school learning community	This study aimed at understanding teacher professional development (TPD) process where there was sufficient IT integration through teacher participation in a school-based community. It looked at TPD effectiveness and its potential problems. Instructional observations and teacher reflections were used as data collection methods. The study findings revealed that teachers changed their perspectives on methods for It integration from lecture based teaching to student-centered teaching via processes of teacher PD. (Liu 2012)	*Can teacher professional development for technology integration in a primary school learning community change teachers' attitudes towards using It in classroom?*
8. Examining the impact of educational technology courses on pre-service teachers' development of technological pedagogical content knowledge	The purpose of this case study was to examine the impact of educational technology courses on pre-service teachers' development of knowledge of technology integration in a teacher preparation program in the USA. The data was collected through interviews, document reviews and observations. The findings showed that it is necessary to offer a course that focuses on technology skills early in a teacher education program, allowing pre-service teachers apply their learned skills in later courses.	*How did the educational technology courses affect development of the pre-service teachers' knowledge of technology integration in a teacher education program?*
9. Using technology for enhancing teaching and learning in Bangladesh: Challenges and consequences	This mixed method study focused on factors relating to the use of technology to support school-based professional development for in-service teachers in Bangladesh. Qualitative methods involved in this study were classroom observations and semi-structured interviews. The study found that mobile technologies can assist learners at the point of need and in ways that fit in with their lifestyle.	*NO research question stated*
10. ICT in English schools: transforming education?	This empirical study demonstrated that sustained educational transformation using ICT involves more than pedagogical awareness alone, and that a broader array of factors should also be taken into consideration moving from traditional top-down to a bottom-up approach. Grounded theory used for interview data analysis. The quality of tech. potential relies more on school leadership to initiate more effective teacher training.	*NO research question stated*
11. Innovation in higher education in China: are teachers ready to integrate ICT in English language teaching?	This case study examined teachers' attitudes towards ICT use in education and ICT-related continuing professional development policies and practices in a university in China. Mixed methods were used: observations, semi-structured interviews and focus groups were used to collect data for qualitative analysis. The study found that teachers can make comprehensive reforms possible but appropriate facilities and resources are essential, relevant professional development is key and on-going support is vital.	*What are EFL teachers' attitudes towards the adopting of ICT in language teaching and the wider context? What are EFL teachers' experiences of CPD? How has CPD met their*

		needs in relation to the national reform and specifically ICT use?
12. Persistence and motivation	This intrinsic case study examined a new teacher's beliefs, motivations and perceptions about how and why technology can and should be used to support student learning. Data were generated through e-mail exchange over the course to identify themes: nontechnical focus, expectations, rationale, impact and beliefs. The study found out that for this teacher persistence was critical to learning in absence of pre-service learning opportunities in the effective application of tech. to support learning.	*NO research question stated*
13. Digital technologies and English instruction in China's higher education system	The paper reported on a study that investigated the views of teachers about use of technology embedded police. It tried to clarify how lecturers in China had been oriented by College English Curriculum Requirements (CECR) towards pedagogical change. Mixed method was used for this study. The qualitative paradigm was based on document review and individual interviews. The study found a significant gap between policy and reality of pedagogical change.	*What are the expectations of higher education English teachers in the use of ICT in implementing the CECR policy? What is the perception of higher education English teachers regarding the expectations of these mandatory syllabus requirements?*
14. Norwegian secondary school teachers and ICT	This mixed method study explored to what extend do teachers use ICT in their classroom teaching and what teacher-level factors influence the use of ICT. 10 focus group interviews were used for qualitative analysis. The study found that integrating ICT in teaching is a difficult and gradual process and teachers must be given time to find their own way to merge ICT with their teaching style.	*To what extend do teachers use ICT in their classroom teaching and what teacher-level factors influence the use of ICT?*
15. Affect and acceptability: exploring teachers' technology-related risk perceptions	This two-phase mixed-methods design study presented a way to understand the complex weighing of teaching and technology values when teachers' choose, or choose not to, integrate technology in their teaching. The case studies in phase 2 comprised of 3 rounds of semi-structured critical incident interviews, classroom observations, document analysis and informant interviews. The findings suggested that as teachers' computer-efficacy decreased the perceived risks related to technology integration increased.	*What risks are the teachers asked to take when using technology and how do they perceive these risks?*

Table 2.2: Summaries of the articles

The examination of the articles systematically concentrates on specific aspects of the studies from Glesne (2011), Kvale (1996), Emerson, Fretz and Shaw (2011), Stake (1995) and Merriam (2009), Robson (2005), Bryman (2008), and Fraenkel and Wallen (2014) in terms of qualitative and quantitative research methods and theoretical frameworks.

Nespor's (2013) "Devices and Educational Change" examines two cases of device-mediated educational changes. One is a video module for a university course and the other is a communication device for disabled children. Both were public funded cases practiced between 1989 and 1991 by two groups of scholars, where the first case was viewed as a success but the second was rejected. Twenty years later there are no records of the devices. The first aim of the paper is to examine the roles of devices in organizational transformations introduced by teachers where the author argues that device mediated changes are effects of non-linear processes arising out of improvisations. The second aim of the paper is to develop theoretical tools for analyzing such changes. Several strengths of the case study approach such as five components of a research design suggested by Yin (2009): "study's question, propositions, units of analysis, logical linking of the data to the propositions, and criteria for interpreting the findings" (p. 27) support their use in this study. As Merriam (2009) explains, "Questions of meaning, understanding, and process are appropriate for qualitative research" (p. 19). The focus on teachers where particular devices were used makes this study bounded and integrated, which are the requirements of a case study (Yin 2009). The article has no further clarifications about the site or participant selections in any of the represented cases. The type of research question posed emerges from the exploratory perspective and confirms the case study as the chosen research strategy (Yin 2009). The study used interview materials from 1989 and 2005 to trace the works of the teachers who designed the devices. The interviews were carried out with administrators, professors and students. However, the study does not include the interview questions, nor does it give other details about the instrument.

Contrastingly, Rasku-Puttonen, Etelapelto, Hakkinen and Arvaja (2006) give detailed description of the method and data analysis in their case study "Teachers' instructional scaffolding in an innovative information and communication technology-based history learning environment". The study was conducted in a classroom setting. A case study should take place in the natural setting of the 'case' to creating the opportunity for direct observations (Yin 2009). The authors clearly explain the case in the abstract of the study, as well as in the methods

section. Yin (2009) explains that for a case study it is significant to define the case in terms of what the case is and where the case leaves off. Authors call their study a single-case study as it aims at exploring the complexity of a single case, which in this study was the use of teacher's instructional scaffolding in an innovative learning environment. Multiple case studies are preferred, because they can be more robust than a single case study and, depending on the results, can strengthen the external validity (Yin 2003, p. 108). However, Yin (2009) justifies single case study if "theory has specified a clear set of testable propositions (p. 110), which is not specified in this article. Schram (2006 in Glesne 2011) explains that "Whether you consider case study as a way of conceptualizing human social behaviour or merely as a way of encapsulating it, its strategic value lies in its ability to draw attention to what can be learned from the single case" (p. 22). Two classes of 34 students from two schools were involved in a five-month learning project and two history teachers were purposefully chosen for the study due to their teaching experience meeting the standards described by Glesne (2011) as, "The strategy of participant selection in qualitative inquiry rests on the multiple purposes of illuminating, interpreting and understanding – and on your own imagination and judgment" (p. 46). Three interviews were conducted with the two teachers: at the beginning, halfway through and at the end of the project. Glesne (2011) defines this as multiple-session interviews and states that repeating interviews throughout the course of the study will aid in developing rapport and increasing the possibility that interviewees will tell the researcher how they feel and act (p. 49). Besides teachers, some students were twice interviewed in groups, when the project was half way through and at its end. Kvale (1996) suggests the qualitative researcher should interview "as many subjects as necessary to find out what you need to know" (p.101). This study used semi structured interviews which were divided into themes of motivational issues and experience with computers. Kvale (1996) explains that semi structured interviews must have "a sequence of themes to be covered, as well as suggested questions. Yet, at the same time there is an openness to changes of sequence to follow up the answers given by the subjects" (p. 124). The interviews with both teachers and students were videotaped. Kvale (1996) explains that video recordings contain a richer representation of the interview situation than the tape. The interviews were transcribed and categorized in a table. The table with detailed explanation and transcribed examples is included in the article. "Transcripts are decontextualized conversations, they are abstractions, as topographical maps are abstractions from the original landscape from which they

are derived" (Kvale 1996, p.165). The study findings demonstrated that conceptions of instructional roles accord with the ways teachers set up the learning sessions. The authors then suggest further studies to analyse the friction of teaching and learning activities.

McGee's (2008) "Persistence and motivation" and Yang's (2012) "ICT in English schools: transforming education?" are two studies that share many similarities in their study designs. Both focus on the same circumscribed system under natural conditions; meaning, teachers' use of ICT through innovative ways in their everyday classroom. Both case studies are designed in accordance with Merriam's (2009) belief that this design is best suited to gain an "in-depth understanding of the situation and meaning for those involved" (p. 19).

The studies do not report on the methods through which the participants were chosen. Both mention in their methods section interviews as qualitative data collection but do not provide details about the types of questions used in the instrument, neither have they had data examples included in the articles. The second study conducted eight 45-60 minute interviews with eight teacher trainers assuming they would have rich experience from year-to-year observations and visits to schools. Because Yang's (2012) study aimed at finding a theoretical framework for understanding the transformation of education with technology, the interview data analysis was based on grounded theory which according to Robson (2002) 'seeks to generate a theory which relates to the particular situation forming the focus of the study" (p. 190). Also, the use of the grounded theory for data analysis is compatible with the aim of the central research question. Neither of the studies demonstrated the trustworthiness of their research apparently hoping that the quality of research craftsmanship will result in "knowledge claims that are so powerful and convincing in their own right they carry the validation with them, like a strong piece of art." (Kvale 1996, p. 252). Both studies conclude that technology use and power in educational institutions rely on teacher training and school leadership. However, they suggest further the need for more systematic research on transformation with technology.

Mahruf, Shohel and Kirkwood's (2012) mixed methods study "Using technology for enhancing teaching and learning in Bangladesh: Challenges and consequences" looks at an early stage of one project's development. Stake (1995) does not see the case study as a method, but suggests that mixed methods inform the case. Six schools were randomly selected for the study. At each school two teachers and eight students were randomly selected. According to Robson

(2002), there are practical and ethical problems when randomizing is applied to people. Merriam (2009) explains that in qualitative research, a small nonrandom sample is selected precisely to understand the phenomena in depth. Because, this is a mixed methods study and both qualitative and quantitative data was generated on the same sample, random selection will be welcomed if taken from the quantitative method's perspective.

For collection of qualitative data semi structured interviews were carried out for four months. The school administrators were interviewed regarding their school policies, teachers regarding their professional development and students about their lessons. The article discusses only teachers' interview data to keep the article manageable. Interview extracts are included in the article where each piece of evidence is given a reference to specify the source of the specific teacher interview transcript. The interview questions and sample responses show flexibility allowing to direct the interview to the topic areas essential to the problem in question. The interviewed teachers received questions depending on their experience with iPods and other ICT devices. The questions were of two types: experience/behaviour and knowledge questions (Glesne 2011, p. 106). Robson (2002) and Kvale (1996) also explain that as information is gained in semi structured interviews, the interview guide and research questions will be updated to incorporate the new information into the next interview. All interviews were conducted in Bangla, recorded, transcribed and translated into English by professional translators. Kvale (1996) considers transcription a translation, both from spoken to written language, and from living and personal conversation to a 'frozen' text which is to be read analytically (p. 165). As to the translation from one language to the other or the way it was done in this study Kvale (1996) would encourage translators to think of transcriptions as 'interpretive constructions' and state that "the question 'What is the correct transcription?' cannot be answered—there is no true, objective transformation from the oral to the written mode. A more constructive question is: 'What is a useful transcription for my research purposes?'" (pp.165-66). The analysis were conducted using grounded theory to identify the key message the teachers wanted to convey through interviews. According to Robson (2002) "Strauss and Corbin (1998) make the explicit point that grounded theory is a general method that can be used in both quantitative and qualitative studies" (p.192). In this qualitative part of the study it is "a non-mathematical process of interpretation, carried out for the purpose of discovering concepts and relationships in raw data and then organizing these into a theoretical explanatory scheme" (p. 192). The study found that building confidence in the classroom is

essential for ICT implementation and peer support and teacher guide are factors to contribute its success.

Howard's (2011) two-phase mixed methods study "Affect and acceptability: exploring teachers' technology-related risk perceptions" presents approaches of controlling resistance and overcoming the challenges of technology integration. In phase one, through four previously validated measures, the level of teachers' readiness to take risks with ICT were determined. Phase one questionnaire was designed for selection of teachers for phase two, which was a comparison case study of two schools and eight teachers. Results from phase one were used to inform phase two findings. The study focused on eight secondary school teachers from two countries: Australia and US, treating them as one sample for both quantitative and qualitative methods. The credibility of eight teachers; four from each country, was checked at all stages of data collection to avoid selecting participants who agree with the researcher's principles. Yin (2009) explains "an investigator seeks only to use a case study to substantiate a preconceived position" (p. 72). The qualitative data collection occurred only in phase two, through three rounds of semi-structured critical incident interviews and key informant interviews which were based on three themes: technology use, teaching and expectations of the school culture. The critical incident technique can use specific incidents or a series of incidents for rich data generation about circumstances, intention, context and behaviour (Robson, 2002). In this study it proved useful because it was implemented as a tool for motivating teachers to reflect on their teaching ways and stages encouraging them to speak from the perspective of a timeline. Flanagan (1954 in Silverman 2000) speaks about critical incident technique as one offering a possibility to go straight into the heart of a subject and gather information about what is really being searched for. The author also used face-to-face key informant interviews for qualitative data collection. Both, Yin (2009) and Stake (1995) explain that the case study approach is used utilizing data from document reviews, key informant interviews, focus groups and observations. Before starting the enquiry with expert teachers, the existing data from phase one and critical incident interviews was reviewed to determine what additional information was needed from key informants. Bryman (2008) explains that "Key informants often develop an appreciation of the research and direct the ethnographer to situations, events, or people likely to be helpful to the progress of the investigation" (p. 409). However, he also discusses the other side of the key informant interviews mentioning that, "…the ethnographer may develop an undue reliance on

the key informant, and, rather than seeing social reality through the eyes of members of the social setting, the researcher is seeking social reality through the eyes of the key informant" (p. 409). The article includes examples from interview data analysis concerning all three themes discussed above. Although it does not represent the questions, the answer extracts show that they were most probably open ended. It is assumed so because the respondents tend to think, express values and give meaningful answers using their own knowledge and experience. According to Merriam (2009) open-ended questions are used to let participants express their views. Judging from the answer excerpts it can be assumed that questions were presupposition type, but by no means leading (Glesne 2011, p. 107), as the sample responses do not show evidence of leading the teachers to answer in any specific way. The interviews were transcribed, pre-checked for obvious mistakes. Through both interviews this study examined why and how some teachers thought ICT was risky and others did not. The interview results together with other methods used for data collection were triangulated. Merriam (2009) explains that one of the means ensuring 'trustworthiness' is through the process of triangulation. She also represents four types of triangulation strategies, one of which; multiple sources of data, was implemented in this study.

Wilkan and Molster's (2011) study "Norwegian secondary school teachers and ICT" explores the factors influencing the use of ICT in three Norwegian secondary schools. The authors give limited information about the qualitative part of the study. Unlike Howard (2011), where the same sample was used for qualitative and quantitative data collection, Wilkan and Molster (2011) used different samples for qualitative data collection. Ten Norwegian teachers were purposefully selected due to their aim of developing ICT skills. "The logic and power of purposeful sampling leads to selecting information-rich cases for study in depth" (Glesne 2011, p. 44). The article does not include information about the participants. Individual interviews were conducted with all participants. The data was analysed by sorting the answers. Interview themes were about the outcomes of ICT, teachers' use of ICT, students' attitudes towards its use in class and learner collaboration. The steps of analysis followed the principles in grounded theory to develop interpretation of data and to refine theoretical analysis. Robson (2002) explains that grounded theory 'seeks to generate a theory which relates to the particular situation forming the focus of the study" (p. 190). The study does not include any qualitative data samples or analysis. The study found that most of the secondary school teachers used ICT but they were not sure about its positive outcomes for their students.

In his article "The paradox of IT in primary schools: E-learning is new but gender patterns are old!" Hellsten (2007) aims at exploring how primary teachers' professional knowledge and practice are influenced by IT. This study might be defined as an instrumental case study as it concentrates on the insights into the question rather than on the individuals involved. As Stake (1995) explains "The more the case study is an instrumental case study, certain contexts may be important …" (p. 64). Moreover, this study can be categorized as a collective instrumental case study because it is assumed by the author that it will lead to what Stake (1995) calls "better understanding about a still larger collection of cases" (p. 66). The qualitative research approach used in this empirical case study is ethnography using semi-structured interviews. Merriam (2009) defines a "sociocultural analysis of a single social unit or phenomenon" as an ethnographic case study. Hellsten's (2007) study is ethnographic since it depicts Swedish secondary school teachers as a community of practice and site for transformational learning. The author has labelled his study an ethnographic case study because the research focus requires him to enter into a close and relatively prolonged interaction with people in their everyday lives and actively participate as a member of the social group in the manner that Emerson, Fretz, and Shaw (1995) advise for this type of research. So this ethnographic collective instrumental case study is a holistic inquiry into the lives of four Swedish secondary school teachers to understand their ways of living, teaching and the meanings they attach to such things as knowledge and innovation. The empirical and holistic approach of the study is appropriate here as it discusses different ways of IT integration in schools by different primary teachers. The clearly defined purpose is followed by the research questions that have been designed focusing on the relationship between IT, gender and teachers' professional knowledge.

One secondary and three primary schools in the North of Sweden were purposefully chosen for the study as they were involved in on-going IT projects. In this paper, analysis is limited to one primary school. Four teachers involved in various IT projects were informed about the study and chosen to participate. The article clearly discusses how the participants were selected. The sampling method here is what Merriam (2009) calls "purposeful sampling" where the goal is "… to discover, understand, and gain insight and therefore must select a sample from which the most can be learned" (p. 77). The sample size of four was chosen to explore the specific problem in depth without seeking to generalize the findings. Geertz (1973) recommends

that a small sample size is important for obtaining thick and rich descriptions. The study brings in sources of information which give insights to the analysis, thus enhancing the trustworthiness of the results. According to Glesne (2011) "the use of multiple data-collection methods contributes to the trustworthiness of the data" (p. 31). The data collection lasted for three months. The process started with two hour semi-structured open ended interviews with each teacher, followed by four classroom observations and ended with follow-up two hour reflection interviews. The interview questions are attached to the article as an appendix. The first interview questions were grouped in three themes: teacher's life story, use of IT for professional knowledge and perspectives of technology on learning. This follows Kvale's (1996) suggestion of arranging questions by grouping them in themes that have a logical sequence. The second interview was a reflection on classroom observations accompanied with some questions from the first interview. Both interviews were tape-recorded and transcribed. Nine types of qualitative interview questions (Kvale 1996) have been clearly followed by the researcher while constructing the interview guide as there are introducing, follow up, probing, specifying, indirect and direct questions left until the end to avoid the bias of leading the interviewee to answer a certain way. The second reflection interview was a conversation between the researcher and the participants about the classroom observations. According to Kvale (1996), an interview as a conversation is a specific "form of conversational technique" (p. 36) and "a basic mode of knowing" (p. 37) that help the researcher understand "human reality … as persons in conversation" (p. 37). Classroom observations are described in this ethnographic study as participant observations. Four observations, 40 – 120 minutes each were carried out with all participant teachers. One sample lesson is included in the article as an appendix. Robson (2002) explains that "Participant observation is a widely used method in flexible designs, particularly those which follow an ethnographic approach" (p. 310). Glesne (2011) defines the goal of participant observations as "making strange familiar and familiar strange" (p. 67). Participant observations were used in this study to measure and assess the ways in which teachers choose and manage IT in their lessons. Robson (2002) adds that "… observation is the obvious method to use in assessing its effectiveness" (p. 310). Unobtrusive observation approach would have described this phase better because, as Holliday (2002) and Robson (2002) mention, it seeks to find out what is going on in a situation as a prelude to subsequent testing out of the insights obtained. The study does not mention if the observation was formal or informal, however; from

the included appendix and further explanation where the author details about his note taking during the observation and considering other information from participants, it is assumed that the observations were informal. “Informal observations are less structured and allow the observer considerable freedom in what information is gathered and how it is recorded” (Robson, 2002, p. 313). The study findings suggest that IT creates a paradox. The data analysis showed that teachers can experience IT as a positive phenomenon challenging new teaching ways and procedures.

Liu’s (2012) empirical case study “Teacher Professional Development (TPD) for technology integration in a primary school learning community” aims to assess the TPD effectiveness and its problems in a school based community. The study investigates possible ways through which TPD in a professional learning community can help teachers acquire novel teaching practices. Yin (2009) defines a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident … [and] relies on multiple sources of evidence” (p. 17). He also explains that a case study is an empirical study that investigates a contemporary phenomenon in depth and with its real-life context (p18). The site of the study was an urban elementary school. The school principal, administrative director and six teachers volunteered to participate in the study after discussing the project with the researcher. The study is silent about the participant selection method but it has a general description of each participant’s age, gender, position and contribution to the project. The researcher, who describes herself as a teacher trainer having six years of experience in evaluating technology related projects, coordinated the study; thus, acting as an overt researcher. Bryman (2008) explains that this ethically correct strategy obviates the need to negotiate access to organizations or to explain why you want to intrude in people’s lives and make them objects of your study (pp. 403 - 405). He also calls this ‘participant-as-observer’ and describes this role as similar to ‘complete participant role’, with a difference that members of the social setting are aware of the researcher’s status as a researcher where he is engaged in regular interaction with participants in their daily lives (p. 410). Robson (2002) also sees this option as feasible and explains that “This stance means that as well as observing through participating in activities, the observer can ask members to explain various aspects of what is going on. It is important to get the trust of key members of the group” (p. 317). The researcher participated in this study not as a teacher but as a coordinator of the project who

was responsible for the project setup and its further development. “One strategy for the participant as observer is to evoke a particular situation or behaviour from the members of the group which essentially involves setting up a situation which has meaning for the group and then observing what happens (Robson 2002, pp. 317 - 318). Observation was the primary evaluation method of the study to answer its research question. Observations can and should be conducted when they allow the researcher to address the research question (Glesne 2011). The method was used to collect data about teachers’ instructional practices to detect changes in their teaching after accomplishing professional training with them. Teachers then were asked to do peer observations concentrating on their peers’ technology use, instructional strategies and behaviours during the lesson. There are four class observations discussed in the article. They include detailed descriptions of observed periods followed by discussion excerpts from all participants regarding specific parts of the lessons. The author mentions that she has written up field notes into a narrative account right after every observed period. “The longer you wait after the event in constructing a narrative account, the poorer such an account will be in terms of its accuracy and completeness” (Robson 2002, p. 324). Judging from the presented observational data, where observation and analysis are tangled, it can be said that the process involved in four participant observations is an example of analytic induction. “In analytic induction observation and analysis are intertwined. This is characteristic of flexible designs which are likely to use participant observation” (Robson 2002, p. 321). The analytical results revealed the efficiency of professional development in IT integration. The study findings also revealed that through professional development the teachers changed their methods for technology integration.

Hsu’s (2012) “Examining the impact of educational technology courses on pre-service teachers’ development of technological pedagogical content knowledge” suggests activities to prepare teachers to teach with technology. It intends to examine the impact of IT courses on pre-service teachers’ knowledge of technology integration. Unlike Liu (2012) who used observations as the primary source, Hsu (2012) used observations as the third source of the data collection. Glesne (2011) explains that “Multiple means of data development can contribute to research trustworthiness and verisimilitude, or sense of authenticity” (p. 48). Maximum variation sampling strategy was used in this qualitative study to select the participants. An invitation email was sent to 50 student teachers before the commencement of the semester. Out of 15 volunteered student teachers eight were selected after the researcher consulted with the office of Clinical Experiences.

All eight participants were representatives of eight different school districts with different levels of IT resources. Glesne (2011) explains that maximum variation sampling method "searches for common patterns across great variations" (p. 45). It is also called heterogeneous sampling, the implication of which is that "the greater the heterogeneity of a population, the larger a sample will need to be" (Bryman 2008, p. 182). Robson (2002) explains that heterogeneous sampling aims at detecting themes which cut across the diversity of people or cases. The researcher carried out observations in all eight schools. Glesne (2011) defines this as multiple sites and explains that looking at different sites should increase the trustworthiness of common themes (p. 50). The demographics of the participants and classroom technology resources are included in the article in a form of a table. The observations were carried out following a checklist which was designed following the features of the constructivist approach proposed by Doering and Rolyer (2009). The article does not speak about the observational method; however, judging from the checklist it can be assumed that observations were structured. "Structured observation, often called systematic observation, is a technique in which the researcher employs explicit formulated rules for the observation and recording behaviour" (Bryman 2008, p. 257). A checklist with evidence of observations, data source and example strategies is included in the article is in the form of a table. Each participant was observed for a predetermined period of time using the same rules. "These rules are articulated in what is referred to as an observation schedule which bears many similarities to a structured interview schedule" (Bryman 2008, p. 257). The observer as participant technique was used in the study as the researcher remained primarily an observer and had limited interaction with the student teachers (Glesne, 2011). The study found that teachers had concerns of when and where to implement educational technology and came up with suggestions for further research.

Troudi and Alwan's (2010) exploratory study "Teachers' feelings during curriculum change in the UAE: opening Pandora's Box" is informed by the interpretive paradigm. It examines secondary school female English language teachers' awareness of curriculum change in the UAE. Merriam (2009) explains that in interpretive research, education is considered to be a process and school is a lived experience. Similarly, Glesne (2011) mentions that it "allows the researcher to approach the inherent intricacies of social interaction, to honour complexity, and to respect it in its own right" (p. 25). The study participants were 16 Arab female teachers; one was a national teacher and the other 15 were expatriates. The authors selected the participants through two approaches: purposiveness and accessibility, because one of the authors, being

female, was not allowed to access boy's schools, as she could not work with male teachers due to cultural restrictions. However, she had full access to girls' schools and work with female teachers. As Bryman (2008) contends, methodologies must tend toward consensus or culturally expected views. Holliday (2002) explains that the researcher and the research participants must enter into a relationship of culture making (p. 149). Curriculum documents and other curriculum related materials were the primary sources for this study. "Although the use of physical trace measures has never achieved much more than curiosity value in the social sciences, there has been substantial interest in the analysis of a particular kind of artefact: the documents" (Robson 2002, p. 348). Glesne (2011) explains that "Your understanding of the phenomenon in question grows as you make use of the documents and artefacts that are a part of people's lives" (p. 89). The data were collected on the year of the curriculum change. Constant comparison technique was used to compare even small incidents in the data. Merriam (2009) explains that instant comparisons lead to categories which later on can lead to theory formulations.

Gao's (2012) "Digital technologies and English instruction in China's higher education system" explores teachers', administrators and policy makers' views about technology implementation in College English Curriculum Requirements. Like Troudi and Alwan (2010), Gao (2012)'s study involved curriculum documents, policy statements, official syllabus documents, course programs from three national universities and nationally approved textbooks to understand the interactions of teachers, administrators and policy makers. Content analysis and data coding were used to map out the picture and answer the research question. "Content analysis is codified common sense, a refinement of ways that might be used by laypersons to describe and explain aspects of the world about them" (Robson 2002, p. 352). The article does not speak about the coding scheme, manual or schedule used for content analysis (Bryman 2008, p. 283), however; it mentions that document review informed the questions designed for teacher interviews, such as issues of IT skills and use. Glesne (2011) states that "Documents can raise questions about your hunches and thereby shape new directions for observations and interviews" (p. 85). The study found out that there is a gap between the policy and ICT pedagogy in Chines tertiary teaching suggesting further research on exemplary learning designs with educational technology.

James's (2006) "A study of participatory action research (PAR) as professional development for educators in areas of educational disadvantage" challenges its use in the USA as

a ‘teacher research’. Through participatory action research this study addresses the gap between researchers and the intended beneficiaries of research (Whyte 1991), who in this study are homeless children. James (2006) has labeled his study participatory action research because it follows the principles recommended by Whyte (1991), which are the collective investigation of the problem, the indigenous knowledge to better understand the problem, and a desire to take collective action to deal with the problem. Eight Primary school administrators, eight teachers and one homeless shelter education provider formed the educators’ team who conducted face-to-face meetings once every two months throughout the 2003-04 school year. The study does not explain how the members of the team have been chosen and where exactly it was carried out rather than simply mentioning the project known as Colorado Educators Using Participatory Action Research to Study Homeless and Highly Mobile Students (CO PAR). Each participant wrote a report after completing one or more cycles of participatory action research and received a $ 3000 stipend upon the completion of the study. The qualitative data was collected through focus groups and interviews. The study does not mention how many focus groups there were and how long the gatherings were scheduled for. Morgan (1997) explains that, “The safest advice is to determine a target number of focus groups in the planning stage but to have flexible alternative available if fewer or more groups are needed” (p. 44). Groups consisted of 17 participants, which are considered to be large according to Glesne (2011): “Small groups of six to ten participants generally work best” (p. 132). If focus groups are large, “they tend to break into subgroup discussions that are difficult to facilitate and record” (p. 132). It was a homogeneous focus group in terms of profession, as all 17 members were educators. “… homogeneous groups … can allow for a more free-flowing, relaxed conversation as well as facilitate the development of analytical concepts based upon data gathered in different kinds of groups” (p.132). To assist in the interpretation of the data the author of this study used an analytic technique of reflective journal writing. The study does not speak about the themes or criteria according to what the contexts were analysed. As Glesne (2011) states, “the comments and thoughts recorded as field log entries or as memos are links across your data” (148). The study outcomes were verified through triangulation which is explained by Stake (1995) as a quality assurance tactic to ensure that research is based on a disciplined approach and not simply a matter of intuition, good intention and common sense (p107).

Hu's and McGrath's (2011) "Innovation in higher education in China: are teachers ready to integrate ICT in English language teaching?" explores the implementation of a national reform in China called College English reform. Qualitative data served as the main element to answer the research questions. It derived from observations, interviews and focus groups. Two teacher and two student focus groups were held during the study. Johnson (1996 in Robson 2002) argues from a critical realist perspective that focus groups have considerable potential to raise consciousness and empower participants (p. 284). Because the sampling for proportionality was not the main concern of the study, it used purposive sampling. Although 44 out of 78 teachers who participated in the quantitative enquiry expressed willingness to participate in focus groups, a smaller sample of 12 teachers were selected for this study following five criteria: gender, age, title, experience and teaching materials used. Glesne (2011) explains that "…homogeneous groups in terms of gender, age, race, or sexual orientation, can allow for more free-flowing, relaxed conversation as well as facilitate the development of analytical concepts based upon data gathered…" (p. 132). The article does not include information about the selection criteria of the student focus groups. The author was the moderator of one hour interviews. Glesne (2011) states that "Generally, focus group gatherings are scheduled for one to two hours" (p. 132). Participants as auditors were asked to check the transcripts. Five questions with sample answers and analysis are included in the article. "Four or five good questions should suffice for somewhat structured focus group session" (p. 132). Focus group interviews were audio-recorded. Robson (2002) explains that "The tape provides a permanent record and allows you to concentrate on the interview" (p. 290). The data was transcribed and interpreted. Categories were identified and relationships between them were analysed. Kvale (2009) suggests being selective and picking out relevant passages, as well as note the tape counter number where there are quotations or examples. The study found out that professional development and suitable resources are effective in making comprehensive reform possible.

Computer Assisted Language Learning (CALL) is often observed as an approach to language learning in which the digital technology is used as an aid to the presentation, practice and assessment of material to be learned. Levy (1997) defined CALL as "the search for and study of applications of the computer in language teaching and learning" (p.1).This term is widely used to refer to the area of technology and second language teaching and learning despite the fact that revisions for the term are suggested regularly (Chapelle 2001, p. 3). Since the mid-1990s

research concerning mobile-assisted language learning (MALL) has explored the use of mobile devices such as iPads, iPods and mobile phones in the process of language learning (Li and Hegelheimer 2013). Today iPads are being massively implemented in the field of education. Though, it is a new trend still in the phase of research and experimentation, there have already been number of large scale studies published proving its power to revolutionize education (Sommerich, Ward, Sikdar, Payne and Herman 2007; Sullivan 2013; Churchill and Wang 2014; Butcher 2014; Hutchison and Beschorner 2014; Chik 2014; Frey, Fisher and Lapp 2015).

There has been an upward investment in higher education institutions around the world in relation to educational practices of digital tablets. However, current field of research into educational implementations of this digital device is limited. Churchill and Wang's (2014) qualitative study reports results of a higher educational affordances of iPad and provides a set of recommendations for iPad applications in higher education. This study outcomes contribute to the understanding of educational transformations iPads and other mobile technology could bring. Similar study highlighting transformational changes in the field of education caused by mobile devices is Frey, Fisher and Lapp's (2015) study called "iPad Deployment in Diverse Urban High School". This study looked at the success of the smooth transformation as being the result of the support and guidance provided to both teachers' and students' iPad applications in urban high schools.

If looked at iPads during their in-class implementation, technological pedagogical content knowledge will seem vital for successful class outcomes. Saudelli and Ciampa's (2014) case study of three iPad language arts classes revealed that the teachers' attitudes toward the integration of iPad technology can form a basis for how they approach their pedagogy. Apparently, not only the teachers' but also the students' attitudes can play a big role in the process of successful educational transformations. Enriquez's (2010) study investigated the ways mobile technology could create interactive learning network. The results showed positive student attitude and perception of the effects of classroom environment on students' learning experience.

There is a growing debate in the field of education about the usability of electronic resources that students have to face if implementing digital technology. The debate is around the technical and pedagogical pros and cons of the e-materials and their ease of use. Scholars argue that electronic materials are traditional print books that are readable across computing platforms and

that screen size or other technical aspects are not follies for their educational implementations (Stols 2013; Ahmad and Brogan 2013; Ber, Lombardo, Honisett, Jones and Weber 2013; Taylor 2013; Liaw and Huang 2014). Not only the scholars argue that digital technology is of no harm to education, but also prove through research that it motivates students into learning and improves student performance (Enriquez 2010; Garner 2011; Walters and Baum 2011; Cooper 2012; Harmon 2012; Hung, Sun and Yu 2015).

A big contribution to the move from inquiry-based model to challenge-based and project-based models in the UAE context is Gitsaki, Robby, Priest, Hamdan and Ben-Chabane's (2013) study called "A Research Agenda for the UAE iPad Initiative". The authors outline a large scale mobile learning initiative in the UAE involving three higher educational institutions. The three case studies outlined in this research revealed the urge for longitudinal research to understand large scale initiatives. Another study conducted by Gitsaki and Robby (2014) is an impact study which looked at Emirati 370 high-school graduates in an intensive academic preparation program where they were exposed to iPads. The results showed high student engagement in learning activities and better exam performance.

The literature review brought together different perspectives of mobile technology use in the field of education. It was wide-ranging considering issues involved in designing, carrying out, analyzing and reporting several types of studies based on technology use in the field of education. It provided an overall structure, while seeking to address some of the complexities in current literature. This was an important task to make features of flexible research design explicit in a sense that the design changes and develops as a result of the researcher's data gathering experiences. However, "No single study or text could hope to cover all you need to carry out 'real world' enquiry" (Robson 2002, p. xxi).

2.3 Theoretical Framework

The theoretical framework guiding this study at all levels is the Activity Theory (AT), which is also referred to as Cultural Historical Activity Theory (CHAT). To justify the choice of the theoretical framework this section looks at AT and its historical origination. It discusses the core

disciplinary authors and models proposed in the field of education through studies conducted in the field from 2004 to 2014.

"Activity Theory or Cultural-Historical Activity Theory is a cross-disciplinary framework for studying how humans purposefully transform natural and social reality, including themselves, as an ongoing culturally and historically situated, materially and socially mediated process" (Roth, Radford and Lacroix 2012, p. 1). Entrenched in the dialectal psychology, it transcends traditional dichotomies of macro and micro, thought and action, intervention and observation, qualitative and quantitative by integrating three perspectives: the objective, the ecological and the sociocultural (Engestrom 1999).

AT was founded by Soviet psychologists Vygotsky, Lurija, Rubinstein and Leontev in the 1930s. Their idea was that activity was a fundamental philosophical and psychological concept because it was the essential notion in any viable philosophical anthropology. Hence, the statement that humans were active creatures was not to be simply registered as an empirical observation. It was never denied by any philosopher that humans act. Yet, it was a statement about the very nature of thought and its behaviour on the world. The Soviet scholar who developed this idea was Vygotsky who initially illustrated it in a form of a basic triangle, which consisted of a subject, an object and an artefact. However, he laid bare what he argued as then a problem in psychological investigation that limited experimental research to reductionist laboratory studies separated from the contexts of human lives (Barab, Evans and Baek 2004).

Vygotsky's theoretical endeavour, later, was linked and elaborated by the Finnish scholar Engestrom, who added societal and contextual dimensions to Vygotsky's model and "[broadened] the process by linking the idea of activity systems to concept of context, stating that contexts are activity systems" (Engestrom 1993 in Esch and John 2004, p. 56). The main concept of this approach is that the individual actions occur in relation to three factors: the available tools, the community and the labour distribution in that community (Figure 2.1). As figure 2.1 explains, the subject implements a tool to perform cognitive functions and cannot directly act on the object. The unit of analysis in AT is the concept of object-oriented, collective and culturally mediated human activity system. According to a leading theorist in AT, Nardi (1996), "Activity Theory focuses on practice, which obviates the need to distinguish 'applied'

from 'pure' science … where understanding everyday practice in the real world is the very objective of scientific practice" (p. 45).

It is by amending and extending Vygotsky's and Leontiev's theories in a way this paper sketches that we can argue for the fruitfulness of AT. In this complex task possible debates with other school of thought should be faced and welcomed. Jonassen and Murony (1999 in Liaw and Huang, 2014), explain that, "When analysing human activity we must examine not only the kinds of activity that people engage in, but also who are engaging in that activity, what their goals and intentions are, what objects or products result from the activity, the rules and norms that circumscribe that activity, and the larger community in which the activity occurs" (p. 4).

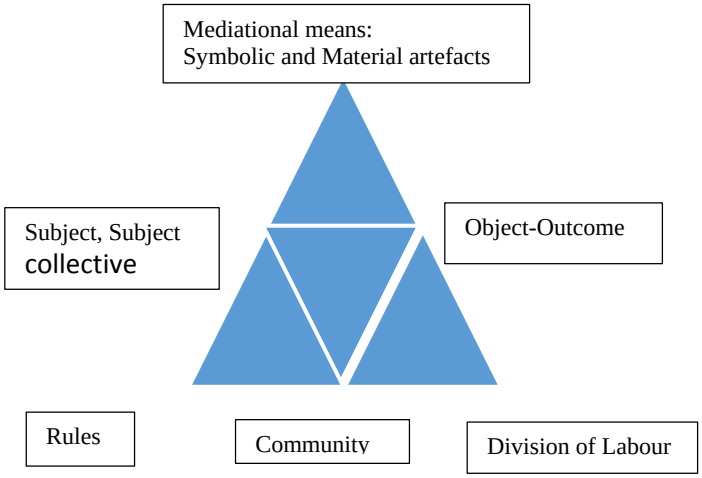
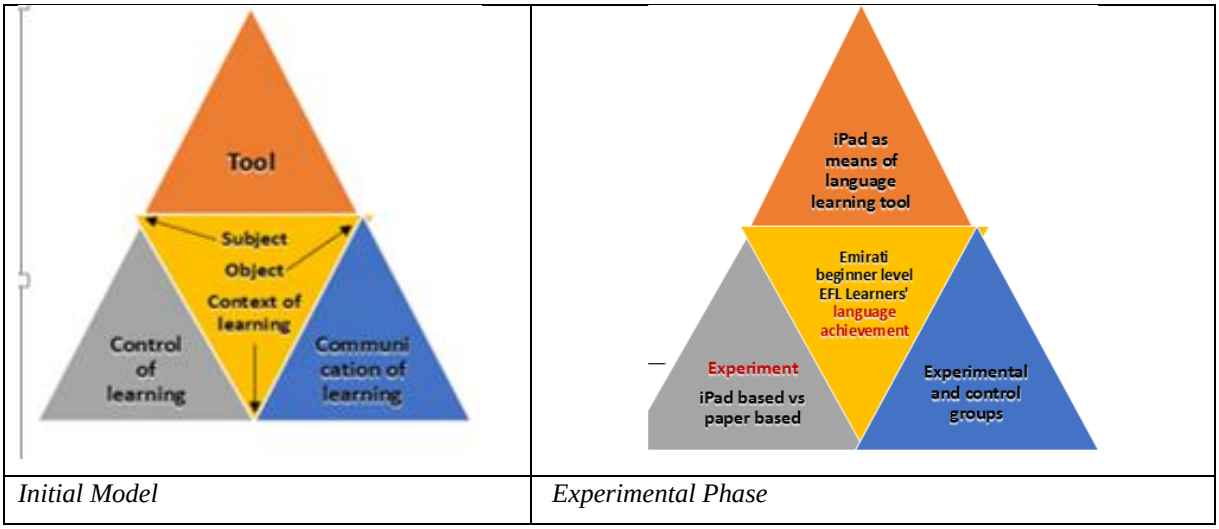


Figure 2.1: Engestrom's complex model of an activity system (Esch and John 2004, p. 57)

When iPad is used in language learning, it is not seen as the object of learning the language but as a device to realize the language acquisition process. Thus, based on the technological outlook of AT, individual functioning is considered to be distributed across and situated within the transaction of the contexts of the subject, available tools, and community with the division of labour (Uden 2007 in Liaw and Huang 2014). Since this study aimed to conduct an AT based enquiry into iPad implementation for language learning in terms of student motivation, satisfaction, device usefulness and learning effectiveness, it conceptualized a research model to provide insights into learner perceptions of the iPads in an educational setting, which then was analysed through factor analysis (Figure 2.2). It shows the initial model of the AT based distribution of the tool, subject and object in connection with the control of learning and communication of learning. The experimental phase model was designed in connection with the

initial AT model where the tool was the iPad as a means of language learning and subjects were Emirati beginner level EFL learners. In the experimental phase the control of learning was realized through iPad based vs paper based learning, and the communication of learning was realized through iPad and textbook groups which both aimed at developing high language achievement.



Initial Model | *Experimental Phase*

Figure 2.2: Activity Theory based model based on EFL learners' iPad use

2.4 Activity Theory in Qualitative and Quantitative Paradigms

The AT has been used as a framework in several studies in the field of education. Esch and John's (2004) qualitative study, "New Insights into Foreign Language Learning and Teaching" is one of them, where the authors examine a case of a peer-revision in a Spanish foreign language writing course. This action research is an example of AT analysis of educational innovation designed and implemented by the language teachers themselves. The study firstly saw a challenge in the AT use, as it required teachers to conceptually step out of their technology-centered conceptions of educational practice, think out of box, and consider the classroom practices as activity systems. The issue with 'centering' approaches, such as student-centered or technology-centered, is that human activity involved with other people and artefacts is mediated in multiple complex ways. Those 'centering approaches' may disguise significant importance of 'non-centered' figures and aspects in educational settings, such as educational orientations, artefacts or even classroom configurations. All of these may be vital in researching and developing educational practices. The study came to conclude that the AT bonds social practice

and human consciousness, and that it has a huge effect when applied to technology and pedagogy. The study states that the AT recognizes individuals and purposeful activities as focus of analysis and key to innovations. This is a framework that stresses human activity, which is mediated by mediational means at hand, communities related to action, the spoken and unspoken rules and division of labour in these communities, and the object and outcome of the considered activity system.

Another qualitative study that took the AT as its theoretical framework is Kim's (2013) "Activity Theory Analysis of Second Language Motivational Self-System: Two Korean Immigrants' ESL Learning". The study looked at two Korean immigrants' ways of L2 learning motivation in Toronto and developed a theoretical triangulation of Dorneyi's (2005, 2009) L2 motivational self-system through the lens of Vygotsky's AT. The study suggests that L2 motivational self-systems can be effectively analysed through an AT perspective which offers a conceptual framework between subjects, mediational tools and communities. Consequently, the AT analysis showed that one of the study participants was able to transform her L2 environments into meaningful affordances, because her belief, which became her mediational tool, revealed equally conductive relations with rest of the elements in the AT system under consideration. The AT analysis of the second participant revealed that his incapability of creating affordances for his belief functioned as mediating tools to intervene his relations with situations and disturb the formation of affordances.

Applying explanation of the activity to pedagogy enables specific activity system analysis to function as units of examination (Nussbaumer 2011). A vivid example of this is Beatty and Feldman's (2012) study called "Viewing Teacher Transformation through the Lens of Cultural Historical Activity Theory," which describes a teacher professional development (PD) program and classroom teaching practices as two interconnected activities. The study came up with the AT model of three stages of the same teacher PD program called TEFA to look at it from the perspective of an object, a tool and a transformed system.

The AT from its digital perspective is represented in Sam's (2012) study entitled "Activity Theory and Qualitative Research in Digital Domains," which provided a conceptual framework to study the nexus of people, digital mobile technology and online community. The study touches upon Prensky's (2012) Digital Native and Digital Immigrant Concepts, and calls in to

explore online communication historically and in context. The study suggests using this framework not only for holistic understanding of interactional digital systems, but also as a means to design better activities which may help people to accomplish their outcomes.

Another important study in the field of education is Lee's (2011) "More than Just Story-Telling: Cultural–Historical Activity Theory as an Under-Utilized Methodology for Educational Change Research" which explored several areas where educational innovation research often faces big challenges. This study looked at the AT from two perspectives: AT as being psychological framework that considers human cognition linked with artefacts, and AT as Practical Intervention Methodology that looks into learning within educational communities.

The book called "Transformation of Learning: Advances in Cultural Historical Activity Theory" (2010), authored by leading theorists in the field, Oears, Wardekker, Elbers and Veer, highly stresses Galperin's influence in the future path of the Cultural Historical Activity Theory. It details the unique input by Galperin with a tight relevance for today's research on cultural dimensions of human development, which is the central question of this approach.

Similar study on the other paradigm of the enquiry is Liaw and Huang's (2014) quantitative study, "Investigating Learner Attitudes Toward e-books as Learning Tools: Based on the Activity Theory Approach," which developed a research model based on the AT to understand learner attitudes towards e-books of two different screen sizes. The study claims that screen size can affect students' perceived self-efficacy and suggests conceptual research model based on the AT approach. Based on the quantitative technological perspective of the AT, the study adapted Engestrom's model and renamed rules into control of learning, community into context of learning and division of labour into communication of learning. In doing so it followed suggestions of such authors in the field as Jonassen (2002), Barab, Evans and Baek (2004), Sharples, Taylor and Vavoula (2005). The study came up with 15 hypothesis and a questionnaire, which covered nine factors. The AT quantitative data analysis suggested that learner characteristics have more predictive value than environment factors on learner satisfaction with and perceived usefulness for e-books as learning tools (p.17).

Literature is full of suggestions by educational theorists, such as Bonnie Nardi (1996), Jerome Bruner (2003) and others, on possible uses of the AT in educational theory, as well as in human-computer interaction design. As Koschmann (1998) explains, several publications encourage designers of computer-based artefacts to turn to the AT as a framework for analyzing user

requirements. Consequently, Nardi (1996) represents an important point of entry for educational researchers in instructional technology and artefact design to investigate what the AT is and how the field evolves. It is approached differently in different studies. Its use and application is twofold regarding whether it is a theoretical concept or a methodology. The answer is simple as it is used in both ways and defined in a way, which embraces both conceptualizations. In all of its approaches, the AT is viewed by such educational scholars as David Bakhust (2009), Bert Van Oers (2010), and Timothy Koschmann (1998) as potentially fertile theoretical paradigm for research in education.

2.5 Activity Theory in Studying Innovations

Leontiev (1978) has defined three interconnected phases of activity system: operations, individual purposeful actions, and collective activities initiated by a social motive (Miettinen 2009), where operations presume machines and artefacts, individual actions presume mediating tools, and collective activities presuppose skills to develop innovations. Several studies followed this concept and used the AT as theoretical framework to explore innovations in different fields, including education. Two of these studies conducted through the AT theoretical framework on educational innovations were already discussed above from different perspective and are not referred to in this section (Esch and John 2004; Lee 2011). Three interesting studies are looked at in this section where the AT served a theoretical framework and helped to come up with detailed qualitative data analysis.

Russell and Schneiderheinze's (2005) study, "Understanding Innovation in Education Using Activity Theory" describes a multiple case study research where teachers employed a constructivist-based learning environment that linked an innovated online educational technology with a unit design. This research is commendable in a sense it put on the top of the AT embedded triangle the innovation under consideration, whereas the middle triangle represented the subject action on the object. During the research, the innovation in the work activity system brought to an imbalance, which resulted in paradoxes between the nodes of activity system. As innovation is naturally contradictory and challenging, identifying those contradictions, as they appear on the way, is vital in determining the accuracy and demands of the changing system. This study solved the problem of contradictions in its innovative system by

implementing a separate unit characterized as turning points and viewed them from different angles as separate activities. Besides, this study developed participant teachers' AT graphical transformation models in sequence over the course of the research, which allowed identifying the paradoxes that arose in the activity systems of those teachers in the data collection phase.

Alike study worth considering is Khanova's (2012) study entitled "Moving Courses Online as a Catalyst of Pedagogical Innovation: An Activity Theory Based View," which suggests that online educational technologies can facilitate pedagogical innovations. Like Russell and Schneiderheinze (2005), Khanova (2012) constructed separate activity system diagrams for each faculty to explore specific elements that occur in transformation of the innovative teaching within and among their activity systems. This study proved AT as an analytical tool for exploring pedagogical innovations and processes linking pedagogy and educational technology in the compound settings of educational institutions.

Another study that sheds light into the use of the AT in technological innovations' field is Karasavvidis's (2009) work "Activity Theory as a Conceptual Framework for Understanding Teacher Approaches to Information and Communication Technologies." Using AT as its theoretical framework, this study explores teacher concerns about a technology oriented innovation. It is particularly interesting in its implementation of AT into the design and implications of innovative technology. Compared to the above mentioned two studies, this one is different with its large sample size for qualitative research, it being 51 teacher participants and 757 online messages to code and analyse. Though AT theoretical framework managed to serve the purpose of this qualitative study, it would have been better to try the AT from quantitative paradigm since the study decided to deal with such large sample sizes.

Because the activity of learning and its transformation have been vital in all times, it is no wonder that so many studies have been conducted on its nature, development and transformation. Aristotle advocated a theory of learning that we would call today learning by doing, which reverberated more than two millennia later in Dewey's works and still remained in consideration after that. This paper is one of those attempts, which aims at exploring the field of language learning by looking at it from the activity system's perspective of innovation.

The literature brought together different perspectives of the AT and discussed current models and theories representing it. However, it is still considered a theory in examination and is

mostly applied in qualitative enquiries. Though there was only one quantitative study discussed in this literature review of AT theoretical framework, there is much empirical and theoretical support for the claim it can be successfully implemented in quantitative studies by such scholars in the field as Bandura (1986), Esch (2004), Lee (2011), Liaw (2014), Roth, Radford and LaCroix (2012). It would be a valuable research to explore the innovative use of iPads in the EFL field through the AT framework and application for the analysis of interrelated activities in the system. Since, there have been no large scale EFL studies conducted on digital tablets as language learning tools, nor ones with the AT framework in quantitative paradigm, it would be a big investment in the field to explore that gap.

Chapter Three

Methodology

This chapter discusses and justifies the relevant research approach, methods and instruments, conduct of the study, as well as the data collection process and the ways it is analysed.

3.1 Research Approach

This study is a mixed method study as it involves the use of both quantitative and qualitative methods. As Fraenkel and Wallen (2014) mention, the use of both methods provides a more complete understanding of research problems than does the use of either approach alone. This study follows mixed method design for two reasons: to help to clarify and explain relationships found to exist between the variables and explore relationships between variables in depth (Fraenkel and Wallen 2014).

The purpose of this study is to investigate Emirati beginner English language learners' perceptions of iPad use as a means of language learning tool and assess its impact on learners' language achievement. The first, second and third research problems are better suited for quantitative paradigm as they require the measurement of variables and their effects on the outcome and apply the results to a large number of students. As Punch (2011) explains, "Quantitative research involves measurements, usually of a number of variables, across a sample" (p. 109). A qualitative paradigm would provide valuable insights into various aspects of the variables of language achievement and attitudes toward the implemented innovation (Glesne 2011). However, the purpose of this study is to confine the investigation to establishing empirical evidence to register the influence of the innovative educational technology on students' language learning achievement and attitudes toward the technology under investigation. Robson (2005) indicates that although qualitative research develops a hypothesis, testing the hypothesis is not part of that research paradigm. This study is streamed to the post positivist approach and pursues objectivity by recognizing the possible effects of biases. Gliner and Morgan (2009) note that this approach embraces experimental design, quantitative data and statistical methods (pp. 28-29).

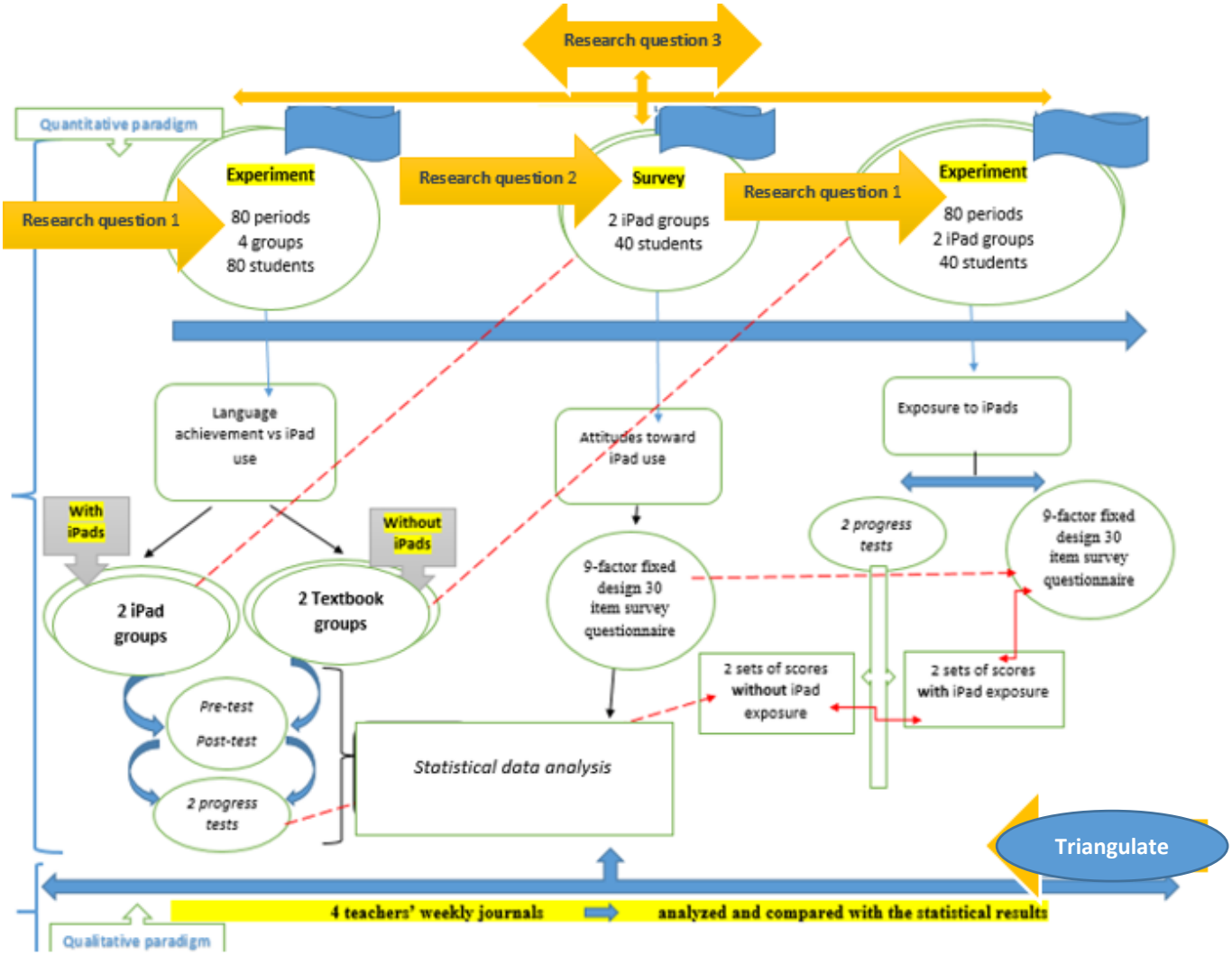


Figure 3.1: Overall Study Design

Figure 3.1 illustrates the overall design of the study. As shown in the quantitative section of the figure, an experimental approach was used to answer the first and third research questions and a survey questionnaire to answer the second research question. The qualitative part of the study is illustrated in the bottom of the figure which was carried out through teachers' reflective journals.

"Although the experimental method finds its greatest utility in the laboratory, it has been effectively applied in non-laboratory settings such as the classroom, where significant factors or variables can be controlled to some degree" (Best and Kahn 2003, p. 159). The laboratory experiment in the context of this study would have been viewed as an artificial setting, set apart

from students' real life by the degree of control and isolation that applies. Therefore, scholars like Robson (2005), Fitzgibbon (1996), Best and Kahn (2003), Cohen, Manion and Morrison (2007), and Fraenkel and Wallen (2014) explain that, if concerns are about generalizing results to the real world, then the experimentation should be in a natural setting. The experimental design enabled this study to determine the changes in student's commitment to language learning caused by the innovative educational technology and the effect the treatment had on the subjects. "[In the experimental research] the researcher has absolutely no interest in linking the person as a unique, named individual to actual behaviour, and the research data can be transferred to a coded, unnamed data sheet" (Cohen, Manion and Morrison 2007, p. 65). "Educational research has, for too long perhaps, relied on the fancy statistical manipulation of poor datasets, rather than studies that start with convincing true experimental design" (Fitzgibbon 1996 in Gorard 2001, p. 133). This study chose the experimental approach for two reasons: firstly, it is the only type of research that directly attempts to influence a particular variable and secondly, it is the best type for testing hypothesis about cause and effect relationships (Fraenkel and Wallen 2014). Another justification for using the experimental approach to answer the first and third research questions is that it allowed manipulating the independent variable, *method of instruction through iPads*, and studying the dependent variable, *language achievement*. As Fraenkel and Wallen (2014) explain, independent variables frequently manipulated in educational research include methods of instruction, types of assignment, learning materials, etc., and dependent variables include achievement, attitudes, motivation, etc." (pp. 261-262).

This study was conducted through the true experimental design, as it used randomization for the homogeneity of the groups and exposure to treatment. It randomly chose participants and allocated them to four groups. The two groups studied English paperless using iPads and were called *iPad groups*, and the other two groups studied English using paperback textbooks and were called *textbook groups*. It followed a true experimental design because there was a manipulation of the independent variable for the purpose of the research, and the random assignment of participants to comparison groups (Punch 2011; Fraenkel and Wallen 2014). It did not employ quasi-experimental design because the students were randomly allocated to four groups for the experiment and the groups were by no means naturally occurring or static ones. As Punch (2011) explains, "In the quasi-experiment, comparisons are possible because of naturally occurring treatment groups… which are fairly clear-cut, though not set up for research

purposes" (p. 71). Fraenkel and Wallen (2014) brought an example of random sampling with 150 names of faculty out of which 25 individuals were chosen for the research (p. 92). Hence, the present study is justified having 250 students out of which 80 were randomly chosen for the true experimental research. Since this study was able to include a large sample into the research, it followed Randomized Solomon four-group design (Figure 3.2), which combines the pretest-posttest control group and posttest-only control group designs (Fraenkel and Wallen 2014).

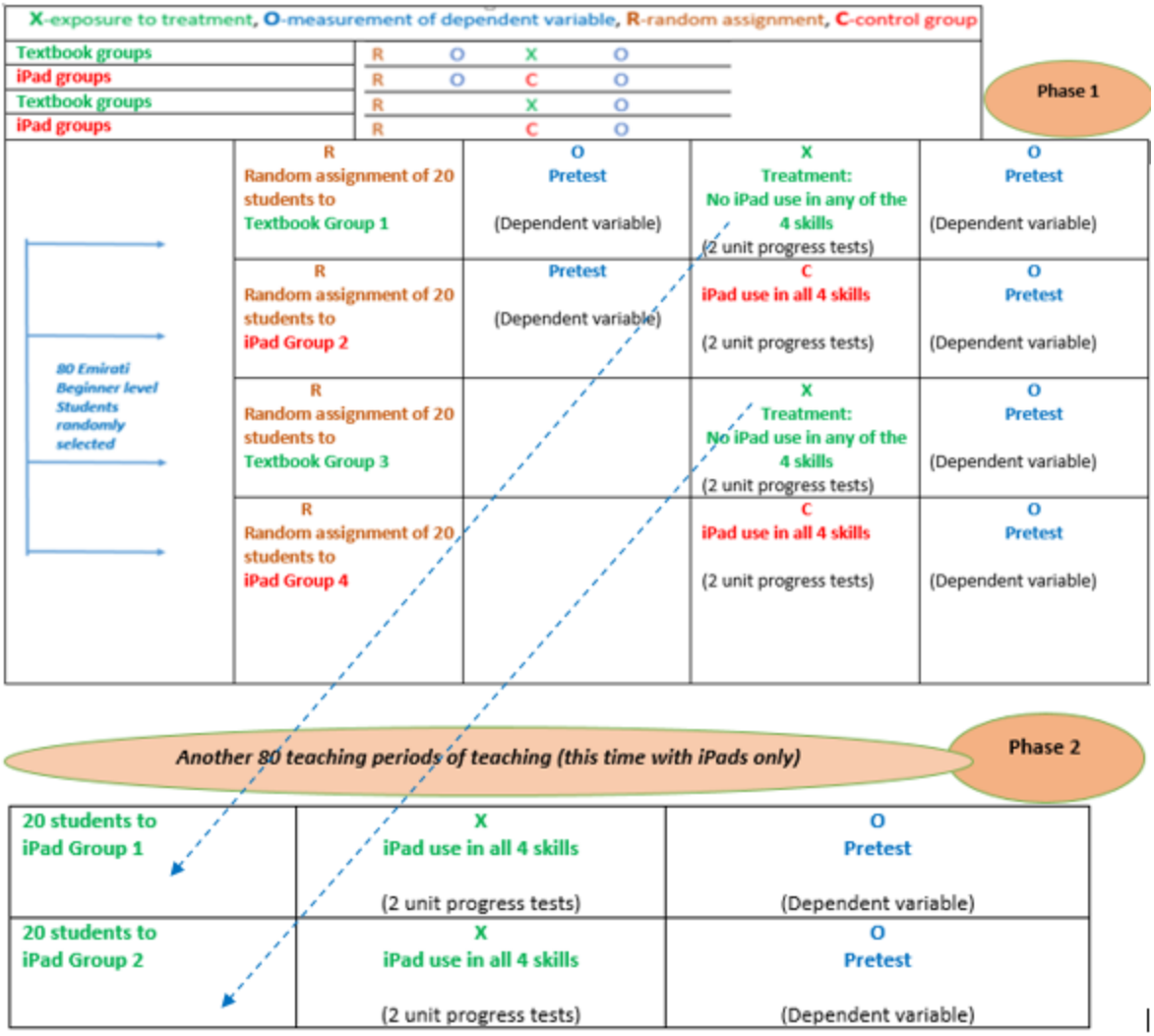


Figure 3.2: Experimental phase design

As Figure 3.2 illustrates, this design was implemented for 80 teaching periods in each of the four groups in the first phase and another 80 periods in two groups in the second phase to provide control of the threats to internal validity and evaluate the effects of the iPad use on language achievement (Best and Kahn 2003; Wiersma and Jurs 2005). There are several studies

in the field of education conducted through true experimental approach and Solomon-Four-Group design particularly. One of them is Parper's (2011) true experimental study on an innovative reading software program called SuccessMaker®, which determined the software impact on students' reading fluency and comprehension levels. A similar true experimental study, Muthomi and Mbugua's (2014) Randomized-Solomon-Four-Group design research, looked at the effectiveness of differentiated instruction on students' achievement in mathematics. Hence, it can be confirmed that true experimental designs have been successfully employed in the field of education to investigate the causes and effects of innovative tools and techniques on the educational process.

As shown in Figure 3.1, the second and third research questions were answered through a cross-sectional survey questionnaire, wholly composed of fixed-choice questions. Gay, Mills and Airasian (2011) define survey as a research that involves collecting data to test hypotheses or to answer questions about people's opinions on some topic or issue (p. 183). The survey collected data through a questionnaire from predetermined population, that is to say, students from four groups under experiment: from two iPad groups in the first phase and two iPad groups in the second phase. Robson (2005) explains that many of the concerns involved in doing a survey are not so much with questions of overall strategic design as with highly practical and tactical matters to do with the detailed design of the instrument (p. 229). "Cross-sectional designs are effective for providing a snapshot of the current behaviours, attitudes, and beliefs in a population … relatively quickly … at a single point in time" (Gay, Mills and Airasian 2011, p. 185). This approach was important for this study to answer its 15 hypotheses, describe the trends in the data and measure current attitudes and practices of the target population (Gay, Mills and Airasian 2011; Fraenkel and Wallen 2014).

When the iPad is used in language learning, it is not seen as the object of learning the language but as a device to realize the language acquisition process. Since this study aimed to conduct an activity theory based enquiry into the iPad implementation for language learning in terms of student motivation, satisfaction, device usefulness and learning effectiveness, it conceptualized a research model to provide insights into learner perceptions of iPads in an educational setting which then was analysed through factor analysis (Figure 3.3). Though surveys are used to collect insights into people's perceptions and attitudes, they are often marked as imperfect to measure such covert traits. Therefore, this study used factor analysis to assess

those latent traits from question-level survey data (Fricker, Kulzy and Appleget 2012; Punch 2011).

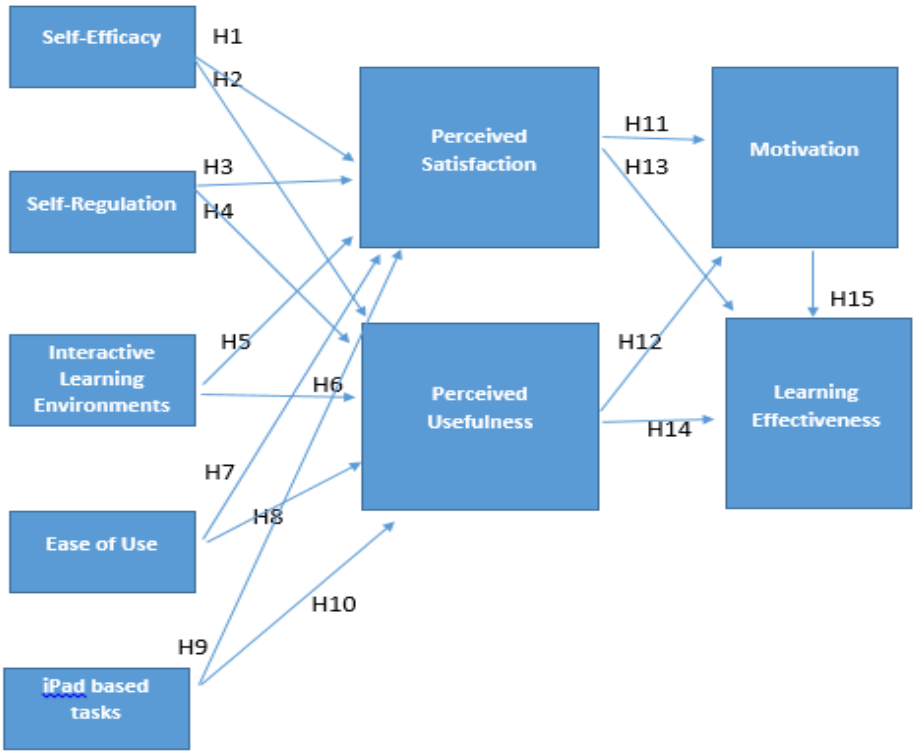


Figure 3.3: Research factors and conceptual hypotheses.

This study presented the following 15 research hypotheses (Table 3.1):

Research Hypothesis
This research reports an Activity Theory based investigation into the use of iPads for language learning in terms of learner motivation, perceived satisfaction, perceived tool usefulness and learning effectiveness. This research tries to understand learners' attitudes toward iPads as language learning tools.
H1: Perceived self-efficacy has positive predictive value for perceived satisfaction toward iPads as language learning tools. H2: Perceived self-efficacy has positive predictive value for perceived usefulness toward iPads as language learning tools. H3: Perceived self-regulation has positive predictive value for perceived satisfaction toward iPads as language learning tools. H4: Perceived self-regulation has positive predictive value for perceived usefulness toward iPads as language learning tools. H5: Interactive learning environment have positive predictive value for perceived satisfaction toward iPads as language learning tools. H6: Interactive learning environments have positive predictive value for perceived usefulness toward iPads as language learning tools. H7: Perceived ease of use has positive predictive value for perceived satisfaction toward iPads as language learning tools. H8: Perceived ease of use has positive predictive value for perceived usefulness toward iPads as language learning tools. H9: iPad based tasks have positive predictive value for perceived satisfaction toward iPads as language learning tools. H10: iPad based tasks have positive predictive value for perceived usefulness toward iPads as language learning tools. H11: Perceived satisfaction has positive predictive value for learner motivation toward iPads as language learning tools. H12: Perceived usefulness has positive predictive value for learner motivation toward iPads as language learning tools. H13: Perceived satisfaction has positive predictive value for the effectiveness of iPads as learning tools. H14: Perceived usefulness has positive predictive value for the effectiveness of iPads as learning tools. H15: Learner motivation has positive predictive value for the effectiveness of iPads as learning tools.

Table 3.1: Research hypothesis

As illustrated in Figure 3.1, the forth research question was better suited for a qualitative paradigm as it required data collected in the form of words rather than numbers (Fraenkel and Wallen 2014). The qualitative data were obtained through weekly reflective journal logs that the teachers involved in this study kept to record the procedure of the experiment for all four groups during the experiment (Figure 3.1). This approach assisted in triangulating the quantitative and qualitative data. The quantitative and qualitative research methods were combined to provide a more complete set of findings than could have been arrived at through the administration of one of the methods alone (Bryman 2003, p. 1142).

3.2 Site and Subject Selection

The site of the study was the largest governmental higher learning institution in the United Arab Emirates that had 17 campuses across the country. The institution provided post-secondary education to 17 – 25 year old Emirati nationals. Campuses were segregated for male and female students but the multinational staff of both sexes taught at either campuses. The

institution started the iPad project in 2012 at the Foundation Studies program and moved from traditional language learning and teaching to paperless and mobile methods, which meant teaching and learning was realized solely through iPad applications, online resources and electronic texts. The Foundation Studies program supported students needing English language assistance in meeting the admission criteria of the Bachelor degree program prior to their entering their chosen program major. The Foundations English courses were the focus for a dynamic initiative in mobile learning using iPads. Instructors in Foundations integrated iPads into their classroom and utilized student-centered pedagogies. Lessons focused on stimulating student interest and increasing their motivation to learn English by providing students with positive learning experiences and interactive tasks with hands-on activities. Teachers used effective scaffolding to move students from being highly supported in the learning process, to being able to develop effective language learning strategies and to become independent learners. They followed the Common Course Outline illustrated in Table 3.2. The Common Course Outline included Course Learning Outcomes, Delivery Framework, Teaching and Learning Strategies, Assessment Strategies and the required educational resources.

Common Course Outline

- ***Course Title:*** Foundations English Level I
- ***Course Number:*** FND 1016
- ***Course Credit Units:*** 16.00
- ***Total Contact Periods Per Week:*** 16 – 20
- ***Degree Level:*** New Foundations
- ***Course Description:***

This is the first of four English language courses at Foundations level. Students enter at a CEFR A1 level (CEPA 150) and exit midway CEFR A2 level (CEPA 156).

- ***Additional Information:***
- ***Grading Mode:*** N - Normal Grading Mode
- ***Prerequisite Course(s):***
- ***Corequisite Course(s):***
- ***Equivalent Course(s):***
- ***Grade Scale:*** HCT Grading Scheme
- ***Must Pass:***
- ***Course Learning Outcomes:***

  - ***Course Learning Outcomes*** 1- Reading: Read short simple texts and understand details and general meaning on familiar topics and situations, at a CEFR A2 level.
  - ***Course Learning Outcomes*** 2- Writing: Write brief messages and paragraphs composed of short simple sentences on a familiar topic, making effective use of common words and basic sentence structures, at a CEFR A2 level.
  - ***Course Learning Outcomes*** 3- Listening: Demonstrate an understanding of common phrases and high-frequency vocabulary on topics of immediate personal relevance, at a CEFR A2 level.
  - ***Course Learning Outcomes*** 4- Speaking: Communicate effectively in simple routine exchanges of familiar information, using common phrases and simple sentences to describe immediate surroundings such as self, family, school, work, etc, at a CEFR A2 level.
  - ***Course Learning Outcomes*** 5- Grammar: Demonstrate an understanding of basic sentence-level grammar at an elementary level on the HCT Core Inventory, apply simple rules for correct spelling of common words, and demonstrate an awareness of the basics of punctuation and capitalization, at a CEFR A2 level.
  - ***Course Learning Outcomes*** 6- Vocabulary: Demonstrate an understanding of the 750 most common words from the Oxford wordlist, and an emerging awareness of the multiple meanings of common words.
  - ***Course Learning Outcomes*** 7- Study skills: Demonstrate a range of good study skills and behaviours: punctuality, participation in class activities, timely completion of homework and assignments, ability to schedule and complete independent study and review, organization as regards materials and equipment, and the use of English as the medium of communication in class.
  - ***Course Learning Outcomes*** 8- ICT: Effectively use the iPad to learn and practice English, to access course materials, and to participate in course activities. Use the internet to search for information. Use the keyboard effectively to write brief messages. Effectively use shared folders in the cloud.

- ***Delivery Framework:***

  This is the first of four English courses at the Foundations level. Students are expected to have solid CEFR A1 competence at the beginning of the course, with a target exit of A2.

  The course focuses on building a repertoire of basic grammatical structures and common phrases, with a strong emphasis on building good vocabulary study habits.

Students will read short simple texts on familiar topics demonstrating understanding of both global and specific detail.

They will be expected to speak about familiar topics related to themselves and to understand similarly simple utterances.

They will be expected to produce short simple written notes at both the sentence and multi-sentence level.

Students will learn how to make use of available technological resources to improve the efficiency of the learning process and to be able to better communicate in English using modern technologies.

Students will be expected to exercise a range of study skills and learning strategies at an introductory level.

- ***Teaching AND Learning Strategies:***

The Foundations English courses are the focus for a dynamic initiative in mobile learning using iPads. Instructors in Foundations integrate iPads into their classroom and utilize student-centered pedagogies. Lessons focus on stimulating student interest and increasing their motivation to learn English by providing students with positive learning experiences and interactive tasks with hands-on activities. The teachers use effective scaffolding to move students from being highly supported in the learning process, to being able to develop effective language learning strategies and to become independent learners.

Teachers engage in discussions with other teachers about language learning and the iPad and utilize their years of experience and training to come up with dynamic new ways to use mobile learning technology to increase student learning both in the classroom and out.

- ***Assessment Strategies:***

Coursework - Foundations College Based Tasks: 70% Comprehensive coursework assessment of student performance in reading, writing, speaking, listening, grammar and vocabulary throughout the term. Colleges are free to set their own coursework assessment tasks. (Outcomes: 1,2,3,4,5,6,7,8)
Coursework - Practical Skills Assessment: 15% Comprehensive practical skills assessment of student performance in reading, writing, speaking, listening, grammar and vocabulary throughout the term. (Outcomes: 1,2,3,4,5,6,7,8)
Final Assessment - Written Examination: 15% (SA) This is a centrally-administered final exam. (Outcomes: 1,5,6)
Total Weight: 100%

- ***Required Educational Resources:***
  - **Student**
  - Soars, Joan/ Soars, Liz (2014) *New Headway plus : beginner - Student book & Workbook* Oxford University Press ISBN: 9780194713382

o Soars, Joan/ Soars, Liz (2010) *New Headway plus : beginner - Workbook without key* Oxford University Press ISBN: 9780194771368 o Soars, Liz/Soars, Joan (2014) *New Headway plus : elementary - Student book & Workbook* Oxford University Press ISBN: 9780194713399 o Soars, Joan/ Soars, Liz (2007) *New Headway plus : elementary - Workbook without key* Oxford University Press ISBN: 9780194771382 o OUP (2012) *Oxford wordpower dictionary for Arabic speakers of English app for iPad* Oxford University Press ISBN: 9780194334495 o Scanlon, Jaimie (2014) *Q skills for success : listening and speaking 1 - Student book with online practice* Oxford University PressISBN: 9780194040389 o McClure, Kevin/ Vargo, Mari (2014) *Q skills for success : listening and speaking intro - Student book with online practice* Oxford University Press ISBN: 9780194040365 o Lynn, Sarah (2014) *Q skills for success : reading and writing intro - Student book with online practice* Oxford University Press ISBN: 9780194040396 o Bixby, Jennifer/ McVeigh, Joe (2014) *Q skills for success : reading and writing intro - Student book with online practice* Oxford University Press ISBN: 9780194040372

Table 3.2: The Common Course Outline of the institution

The program offered four levels of English proficiency: beginner, pre-intermediate, intermediate and advanced. This experimental phase concentrated on one of its 17 campuses, on the Foundation Studies program and on the level of English proficiency called beginner level or level 1. This was the first of four English courses at the Foundations level. Students were expected to have CEFR A1 (Common European Framework of Reference) competence at the beginning of the course with a target exit of A2. The Common European Framework of Reference was established by the Council of Europe as a way of standardizing the levels of language exams in different regions. It is used internationally and all important exams are mapped to the CEFR. According to CEFR, A1 is the lowest level of generative language use, where the student can interact in a simple way, ask and answer simple questions, initiate and respond to simple statement in areas of immediate need or on very familiar topics, rather than relying purely on a finite rehearsed, lexically organized repertoire of situation specific phrases. The target exit of the course being CEFR A2 presupposed students being able to function in social situations, understand frequently used expressions, communicate in simple and routine tasks (Retrieved from St Giles International 2016).

The Foundations level 1 curriculum covered the following functions, grammar, topics and themes, as well as the following language skills on the A2 level (Table 3.3):

Foundations Level 1 Curriculum

Functions

F1. Apologizing and thanking, **F2.** Asking for and giving personal information, **F3.** Asking for clarification, **F4.** Describing habits and routines, **F5.** Describing objects, **F6.** Describing past experiences (introduction & basic use of past tense), **F7.** Describing people (appearance and personalities), **F8.** Describing places, **F9.** Describing similarities and differences, **F10.** Following and giving basic directions, **F11.** Following Classroom Instructions, **F12.** Introducing one's self and other people, **F13.** Requests (asking politely), **F14.** Suggestions (formulaic), **F15.** Telling the time, **F16.** Using dates, years, calendar, **F17.** Using numbers including fractions and percentages

Grammar

G1. Adjectives (use and word order), **G2.** Adverbial phrases of time, place and frequency – including word order, **G3.** Adverbs of frequency (use and word order), **G4.** Articles (definite, indefinite, zero article) – with countable and uncountable nouns, **G5.** Basic Syntax (SVO, SVC, Phrase structure), **G6.** How much/how many, **G7.** Imperatives, **G8.** Modals: can/can't (ability), must (obligation), **G9.** Parts of Speech, **G10.** Past simple (regular verbs and some common irregular verbs), **G11.** Phrasal verbs – common & formulaic expressions, **G12.** Possessive adjectives, **G13.** Possessives – use of 's, **G14**. Prepositional phrases (place, time & movement), **G15.** Present Simple, **G16.** Pronouns: subject & object, **G17.** Questions (Yes/No, Wh-questions, present simple and past), **G18.** There is/are (correct use with nouns and articles, including interrogative & negative form), **G19.** This/That, These/Those, **G20.** To be, including interrogative and negative forms, with adjectives in both simple present and past, **G21.** Verb + ing/infinitive: like, want, would like

Discourse Markers

DM1. Connecting words: and, or, but, because, so, **DM2.** Linkers: sequential (first, second, then, next, after that, finally)

Topics and Themes

T1. Activities: hobbies, interests, and leisure activities, **T2.** Animals, **T3.** Celebrations/Traditions, **T4.** Classroom Routines and Teacher Expectations, **T5.** Clothes & Appearance, **T6.** Education, **T7.** Everyday objects, **T8.** Family, **T9.** Food and drink, **T10.** Holidays/Travel, **T11.** Nationalities, countries, and languages, **T12.** Rooms and things in the house, College, **T13.** Technology (iPads, printer, copier, mobile, etc.), **T14.** Things in your neighborhood, the town, shops and shopping, **T15.**

Language Skills: Foundations Level 1: A2

Reading

R1. Can demonstrate basic recognition of different types of text, **R2.** Can guess the meaning of a word using contextual clues, **R3.** Can identify basic pronoun references, **R4.** Can identify specific information in simple written material he/she encounters such as websites, e-mail messages, SMS messages, brochures and short news articles describing events, **R5.** Can identify the main idea in a short reading text, **R6.** Can make use of clues such

as titles, headings, illustrations, paragraphing, and punctuation, **R7.** Can read short simple texts and understand details and general meaning on familiar topics and situations, **R8.** Can read simple texts up to 350 words with a reading difficulty of up to 7, as measured by the Flesch-Kincaid readability index, **R9.** Can understand everyday signs and notices: in public places, such as streets, restaurants, metro stations; malls, airports; in workplaces, such as directions, instructions, hazard warnings, **R10.** Can understand simple instructions on equipment encountered in everyday life - such as an iPad, a smart phone, an ATM, a printer.

Examples of Text Types Level 1 and 2: Text types for reading: signs (e.g. street signs), instructions (e.g. how to book a ticket, use a vending machine, use an ATM), notices (e.g. warnings), posters, advertisements, brochures, leaflets, guides (e.g. hotel guides, city guides), price lists, timetables, bills, tickets, TV programs, maps, simple graphs, online telephone directories, forms (e.g. landing forms, hotel registration forms), shop signs, product packaging (e.g. in supermarkets), personal correspondence (letters, e-mails, e-cards, memos, text messages), informative articles/features/weather forecasts from newspapers, magazines, and online news websites, descriptions of people and their personal details (e.g. profiles and bios), narratives and graded readers.

Writing: W1. Can do basic self- and peer-editing using a predetermined checklist. **W2**. Can write short simple sentences on a familiar topic, making effective use of common words from the HCT Word List for Level 1 and basic sentence structures and linkers as specified in the HCT Core Language Inventory. **W3.** Can write short, simple formulaic messages (e.g. emails) relating to matters of immediate need and expressing thanks or apology. **W4.** Progressively extend writing to simple descriptive and basic narrative paragraphs in present and past tense (handwritten and on digital platforms) of at least 100 words.

Listening: **L1.** Can follow changes of topic of factual news items, and form an idea of the main content. **L2.** Can follow videos and audio recordings of about 3-5 minutes. **L3.** Can understand basic directions relating to how to get from A to B, on foot, driving or by public transport. **L4**. Can understand gist and extract specific information from short recorded passages dealing with predictable everyday matters that are delivered slowly and clearly. **L5.** Can understand phrases and expressions related to areas of immediate priority (e.g. very basic personal and family information, times, dates, money, numbers, shopping, local geography, weather, College, employment) provided speech is clearly and slowly articulated.

Speaking: **S1.** Can answer straightforward follow up questions if he/she can ask for repetition, and with some assistance with his/her reply. **S2**. Can briefly describe his/her family, possessions, home, town, country, educational background, job, hobbies, etc. in simple terms. **S3**. Can communicate effectively in simple routine exchanges of familiar information, using common phrases and simple sentences to describe immediate surroundings such as self, family, College or work, etc. **S4.** Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters to do with College or work and free time. **S5.** Can demonstrate appropriate turn taking skills. **S6.** Can express a simple opinion when

addressed directly in the classroom, provided he/she can ask for repetition of key points or clarification if necessary. **S7.** Can express likes and dislikes **S8.** Can give a short (2- 3 minutes), rehearsed, basic presentation on a familiar subject. **S9.** Can handle very short social exchanges (in person and on the phone) and may struggle to keep conversation going. **S10.** Can make and respond to invitations and apologies. **S11.** Can record a message on a familiar topic (e.g. identify self on the phone and state purpose). **S12.** Can use simple everyday polite forms of greeting and address.
Vocabulary: V1. Can demonstrate an understanding and spelling of the Level 1* words (as a minimum) on the HCT Word List based on the Oxford 3,000 Word List, and an emerging awareness of the multiple meanings of common words. *Level 1 = A2 Words, The HCT Word List should be used as reference material (Appendix B)

Table 3.3: Foundations Level 1 Curriculum

The beginner level and the Foundations language program were chosen for the experiment because this was the program and the level that all students needed to complete first as they entered the institution and this was when they tried iPads for language learning purposes for the first time.

Research participants were 17 to 25 year old Emirati women who, after high school, were placed in higher institutions according to their Common Educational Proficiency Assessment test results. Common Educational Proficiency Assessment (CEPA) is a set of locally developed standardized tests used for admissions and placement by three federal institutions of higher education in the United Arab Emirates: Zayed University, the Higher Colleges of Technology, and United Arab Emirates University. The tests are produced by the United Arab Emirates Ministry of Higher Education and Scientific research as part of National Admissions and Placement Office (NAPO) and administered in the above mentioned three federal institutions. Around 17,000 grade 12 Emirati students take the tests each year. There are two CEPA exams: CEPA-English tests that measure basic English proficiency and CEPA-Math that measure basic math skills. Both exams are administered in two formats: paper-based and computer-based (Retrieved from The United Arab Emirates Ministry of Education webpage).

The students entered at the CEFR A1 level having CEPA score of 150 and were expected to exit midway through CEFR A2 level CEPA 156. Out of 250 newly admitted students, 80 were randomly chosen for the experiment. Then, the 80 students were randomly placed in four different groups: two iPad groups and two textbook groups, 20 students in each. The researcher and three other level one teachers were assigned to teach those groups, each teacher teaching one

group. The teachers were employed by the institution and were equally experienced and qualified to work with level one students. Though students were called level one or beginner level students, they were actually false beginners, since they studied English in secondary and high school. However, for some reason they did not improve their English language proficiency at school and scored low in CEPA-English. According to the institution's rules and regulations students entering the institution with CEPA scores of 150 were named level one or beginner level. Therefore, the student participants in this study were named beginner or level one students.

3.3 Methods and Instruments

The methodology represented in this section discusses the experimental research, survey research and the reflective journal writing research.

3.4 Experimental Research

The experimental phase was conducted through the Randomized Solomon Four-Group design, which requires random allocation of students to four groups: two experimental and two control, with two of the groups being pre-tested and two not. The Randomized Solomon four-group design combines the pretest-posttest control group and posttest-only control group designs and provides the best control of the threats to internal validity (Fraenkel and Wallen 2014, p. 268). Since this design was an attempt to eliminate the possible effect of the pretest, only one control and one experimental group took the pretest but all four groups took the posttest in the end.

The true experimental design was thought to be the best fit for this study because it used randomization for the homogeneity of the groups and exposure to treatment. It randomly chose participants and allocated them to four groups. The two groups studied English paperless using iPads and were called *iPad groups*, and the other two groups studied English using paperback textbooks and were called *textbook groups*. It followed a true experimental design because there was a manipulation of the independent variable for the purpose of the research. It did not employ quasi-experimental design because the students were randomly allocated to four groups for the experiment and the groups were by no means naturally occurring or static ones.

The experiment began from the second week of the new semester to give students the first week to adjust to the new institution, take orientation sessions, purchase iPads and download the applications needed for the Foundations program to commence. The second week started with the pre-test in one of the iPad groups and one of the textbook groups and commenced with the integrated teaching of the four skills: reading, writing, listening and speaking. The pre-test and post-test was a Cambridge Key English Test (KET) from University of Cambridge ESOL Examinations: English for Speakers of Other Languages (Appendix A). Cambridge Key English Tests (CKET) were proved and successfully used as diagnostic and practice tests in the institution. CKET tests the reading, writing, listening and speaking skills of speakers of other languages studying English as a foreign language and is at Cambridge Level One, Council of Europe Level two (Key English Test, p. 5). As shown in the Appendix A, the test consisted of three sections called paper one, paper two and paper three. Paper one was the reading and writing test, which consisted of nine parts and fifty-six questions. The reading section contained the first five parts and the writing section contained the last four parts of the test. The reading and writing paper lasted for one hour and ten minutes and carried fifty percent of the total one hundred. The test included matching, multiple choice and gap filling exercises. Paper two was the listening test, which consisted of five parts and twenty-five questions. It lasted for half an hour which included the eight minutes of answer transfer time. The listening paper carried twenty-five percent of the total one hundred. The test included matching, multiple choice and gap filling exercises. Paper three was the speaking test, which consisted of two parts and was run by two examiners where only one examiner talked to the candidate while the other was observing. There were two candidates being examined at the same time. During the first part of the speaking examination the examiner asked general questions to the candidates and expected individual answers. In the second part the examiner asked the candidates to speak to each other, and to ask and answer questions. The examiner gave one of the candidates a card with words on it and asked them to use the words to ask questions to the partner and wait for the answers. Then the candidates changed roles.

All four groups followed the Common Course Outline. The course focused on building a repertoire of basic grammatical structures and common phrases, with a strong emphasis on building good vocabulary study habits. The course required students to read short simple texts on familiar topics demonstrating understanding of global and specific details, as well as to speak

about familiar topics related to themselves and practice simple utterances. They were required to practice and produce short written notes at sentence and multi-sentence levels and exercise a range of study skills and strategies at an introductory level.

The groups used the following textbooks for the course as mentioned in the Common Course Outline: *Q: Skills for Success INTRO: Reading and Writing* and *Q: Skills for Success INTRO: Listening and Speaking*. The books provided a unique critical thinking framework for each unit, which was meant to develop key cognitive skills such as analyzing, synthesizing, and evaluating—as well as developing the language skills essential for academic success. Learning outcomes were clearly stated at the start and end of the units, with competency self-evaluations and vocabulary check lists featuring the Academic Word List, which enabled the teachers to define learning outcomes effectively. The units in *Q: Skills for Success INTRO: Reading and Writing* were divided into reading, vocabulary building and writing sections. The units in *Q: Skills for Success INTRO: Listening and Speaking* were divided into listening, vocabulary building and speaking sections. The set included the Teacher's Handbook, which came with the audio discs and unit progress tests. Groups kept the consistency and covered one unit from each book per week. So, 20 periods were given to cover one unit from Q: Reading and Writing, and one unit from Q: Listening and Speaking every week, as per the institutions' work plan (Table 3.4).

FND Level 1 Work Plan 2014 – 2015 Q-Skills Intro			
Week	**Reading and Writing**	**Speaking and Listening**	
2	Unit 1: What kind of person are you? Reading 1: What kind of person are you? Reading 2: Cristiano Ronaldo.	Unit 1: What are you interested in? Listening 1: Are you interested in art? Listening 2: The life of Liz Alan.	Grammar: • Simple Present, verb 'to be' • who, what, where Writing • Write about yourself and a friend. • Personality, appearance, interests Listening • Listen to people talking about their interests • Listen to people giving examples Speaking • Interview a student about his or her interests • Give a presentation on good ways to make friends and give details and examples **Progress test 1**
3	Unit 2: Who are your friends? Reading 1: Different kinds of friends.	Unit 2: How do you make friends? Listening 1: Making friends. Listening 2: Kate and Sun Hee.	
4	Unit 3: Do students spend too much time in school? Reading 1: Comparing schools in 3 countries. Reading 2: Schools in Germany and around the world	Unit 3: What makes a good school? Listening 1: Let us take a tour. Listening 2: Listening for examples.	Grammar • Adjectives and adverbs. • Verbs + gerund or infinitive. Writing: • Write about your college • Describe a special meal or celebration. Listening • Listen to a college campus tour • Listen to people giving reasons for food choices Speaking • Give a presentation on a plan for a perfect school or college • Interview a student about his or her food choices **Progress test 2**
5	Unit 4: When do we eat special foods? Reading 1: Celebrating the New Year with food. Reading 2: Dictionary entries.	Unit 4: How do you choose your food? Listening 1: Lifestyles and Food Choices. Listening 2: Listening for reasons.	

Table 3.4: The work plan

As illustrated in Table 3.4, the students in all four groups covered unit 1 from Reading and Writing book and unit 1 from Speaking and Listening book in week 2. In week 3 they covered unit 2 from the Reading and Writing book, as well from Speaking and Listening book. They were introduced to the Grammar aspect of Simple Present tense, verb 'to be' and 'Wh questions. Students in all four groups did writing about themselves and their friends and completed listening exercises about people's interests. They also did mini presentations about making friends. After the first two weeks all four groups wrote the progress test one. Then, the

groups covered two more unit units. In week four they studied unit 3 from Reading and Writing book and unit 3 from Speaking and Listening book. In week five they studied unit 4 from Reading and Writing book and unit 4 from Speaking and Listening book. Within weeks four and five the students were introduced to adjectives, adverbs and verbs in the grammar skill. They practiced writing sentences and small paragraphs about their college and special meals and celebrations. They practiced their listening skills following small talks about people describing their colleges and giving reasons for their food choices. Students, then came up with mini projects and presentation plans for a good school and interviewed their friends about individual food preferences. Finally the four groups took the Progress test two. So, four units were covered from each textbook within 80 periods of English language class. Two progress tests were administered during the experiment in all four groups. Each progress test was administered after the completion of two units from each book, meaning, units one and two from both books were tested through progress test one and units three and four from both books were tested through progress test two. The aim of the progress tests was to measure students' language achievement throughout the experiment. The statistical analysis of this data supported the analysis of the pretest and posttest data that the Randomized Solomon Four-Group design experiment revealed.

As mentioned above, all four groups followed the work plan and covered the same material, although, with different methods of instruction (Table 3.5).

The Treatment Plan	***Classes with iPad*** (iPad groups)	***Classes without iPad*** (Textbook groups)
Reading: *Reading texts*	Interactive e-book	Paper book
Reading task completion (*E.g. creating conceptual maps, story lines, time lines, meaning depiction, etc.)*	Annotation apps, Screen Chomp, Educreations, Skitch, PuppetPals HD, DocScan HD, Popplet, etc.	Pen, pencil and highlighter
Vocabulary and Spelling *(E.g. working with Oxford 3000 lists, practicing vocabulary and spelling)*	E-book interactive exercises, Spelling City, Socrative, My Library, Vocabulary puzzles, etc.	Textbook exercises, print out materials
Writing: Writing scripts	Interactive e-book and Pages	Paper and pen
Writing task completion (*E.g. writing sentences and paragraphs, completing grammar and spelling exercises*)	Academic writing in English, Grammar checker, English Spelling and Punctuation, iAcademic, etc.	Paper and pen
Brainstorming and outlining (*E.g. planning ideas, conceptualizing the plot, outlining the steps*)	MindMeister, Brainstorming Canvas, iMindQ, Project Planning, Mindomo, etc.	Paper and pen
Listening: Listening audios	Interactive e-book	Textbook attached CD
Listening task completion (*E.g. listening to dialogues, talks, watching videos and completing exercises, taking notes while listening*)	Listening Master, Sound Note, Voice recorder, SoundCloud, Wattpad, etc.	CD and book exercises
Speaking: Speaking tasks (*E.g. discussing statements, giving suggestions, offering help, debating over a topic, presenting themes*)	Oral and virtual discussions, Audio blogs, Voice messaging, KeyNote presentations, iMovies, Prezi presentations, etc.	Oral discussions, debates, poster presentations
Communication (*E.g. sharing information with peers and teachers, asking and answers questions concerning the language*)	Online and real time student-student and student-teacher interaction	student-student and student-teacher interaction

Table 3.5: The treatment plan

As illustrated in the Table 3.5, the iPad groups followed the conditions set by the institution and fully used iPads for their language learning with no presence of traditional learning methods: such as paperback texts, stationary or pen-written notes. Instead, they used annotation apps to complete the exercises, presentation apps to create presentations, interactive texts to complete reading and writing tasks and individual audios to complete the listening exercises. In the contrary, the textbook groups did not use iPads for anything and followed the traditional methods of using pen and paper for writing and paperback texts for reading. The experiment lasted for 80 teaching periods, which was followed by the posttest. Each period lasted for 50 minutes. Students had four periods of English every day, from Sunday to Thursday. They did not take any other subjects except English throughout level one.

After the first phase of the experiment, the two textbook groups that were not exposed to iPads became iPad groups in phase two and commenced their studies by using iPads for another 80 teaching periods (Figure 3.2). In this second phase, the groups used annotation apps to complete the e-book exercises, presentation apps to create multimedia presentations, interactive texts to complete reading and writing tasks and individual audios to complete the listening exercises. Another two units were covered from each textbook within 80 periods of English language class. Like in phase one, in phase two as well, two progress tests were administered in both groups. Each progress test was administered after the completion of two units from each book. The aim of the progress tests was to measure students' language achievement throughout the experiment and compare it with the first set of scores from phase one, when they were not exposed to iPads. This phase served as a within-method triangulation. The intention here was originally to maximize the validity of research by playing the methods off against each other (Flick 2006).

3.5 Survey Research

The cross-sectional self-completion fixed-design survey questionnaire was administered in two phases. Gay, Mills and Airasian (2011) define survey as a research that involves collecting data to test hypotheses or to answer questions about people's opinions on some topic or issue (p. 183). The survey collected data through a questionnaire from predetermined population, that is to say, students from four groups under experiment: from two iPad groups in the first phase and

two iPad groups in the second phase. Robson (2005) explains that many of the concerns involved in doing a survey are not so much with questions of overall strategic design as with highly practical and tactical matters to do with the detailed design of the instrument (p. 229). "Cross-sectional designs are effective for providing a snapshot of the current behaviours, attitudes, and beliefs in a population … relatively quickly … at a single point in time" (Gay, Mills and Airasian 2011, p. 185). Though survey method lacks control over variables and threats to validity, it yields empirical results. This approach was important for this study to answer its 15 hypotheses, describe the trends in the data and measure current attitudes and practices of the target population (Gay, Mills and Airasian 2011; Fraenkel and Wallen 2014).

First, it was administered after the first phase of the experiment only with two iPad groups because those two groups were exposed to iPads and had already formed attitudes toward the iPad use in language learning. Secondly, the survey was administered after the second phase of the experiment to the two iPad groups that were exposed to iPads in the second phase of the experiment. Each phase of the experiment lasted for 80 teaching periods. Therefore, the time gap between the second-time survey administration was after 80 teaching periods.

The survey questionnaire followed Robson's (2005) checklists: to help avoid problems in question wording (p. 245) and factors in securing a good response rate to a postal questionnaire (p. 249). No open-ended questions were used in this survey since the responses were expected to be 80. "Cut down open-ended questions to a minimum with this type of questionnaire unless you can afford to spend a lot of time on analysis or have only a small number of responses to deal with" (Robson 2005, p. 245). This survey addressed nine factors:

1. self-regulation
2. self-efficacy
3. interactive learning environments
4. ease of iPad use
5. iPad based tasks
6. perceived satisfaction
7. perceived usefulness
8. motivation
9. learning effectiveness

This nine-factor survey questionnaire used a seven point Likert scale rating from *completely disagree* = 1 to *completely agree* = 7.

Survey items			
Factors	Items	Content	Scale
self-regulation	SLFREG01 SLFREG02 SLFREG03	iPads are easy to **carry** iPads are **active** language learning tools iPad apps for language learning are **easy** to regulate	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
self-efficacy	SLFEF01 SLFEF02 SLFEF03	I am confident using my iPad **in class** I am confident using my iPad **for the test** I am confident using my iPad for **electronic resources**	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
interactive learning environments	INTLRENV01 INTLRENV02 INTLRENV03 INTLRENV04 INTLRENV05	I believe the iPad can develop **communication between the students** I believe the iPad can develop **communication between the students and the teacher** I believe the iPad can be a means of **information gaining** I believe the iPad can be a means of **information sharing** I believe the iPad can be a means of **language learning**	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
Ease of iPad use	EASEUSE01 EASEUSE02 EASEUSE03	It is easy to **read** on the iPad It is easy to **write** on the iPad It is easy to **listen** on the iPad	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
iPad based tasks	IPDTSK01 IPDTSK02 IPDTSK03	iPad based tasks provide **language learning** iPad based tasks are **interesting** to do iPad based tasks are easy to **share**	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
perceived satisfaction	SATISF01 SATISF02 SATISF03	I am satisfied with the **availability** of iPad language learning applications I am satisfied with the electronic **format** of the language learning applications I am satisfied with the iPad based **assessment** applications	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
perceived usefulness	USEFLNS01 USEFLNS02 USEFLNS03	I believe **language learning** through iPads is productive I believe acquiring **language learning skills** through iPads is productive I believe acquiring **literacy skills** through iPads is productive	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
motivation	MOTIV01 MOTIV02 MOTIV03	I **enjoy** using iPad for my language class I **plan** to continue learning English through my iPad I **encourage** others to start using iPad for language learning	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree

learning effectiveness	LRNEFFCT01 LRNEFFCT02 LRNEFFCT03	I feel iPads could enhance language learning **effectiveness** I feel iPads could **motivate** learners into language learning I feel iPads could provide **interactive** ways to develop language skills	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree

Table 3.6: Survey items

The questionnaire items illustrated in Table 3.6, were revised from Liaw and Huang (2014) and were designed to address Emirati students' perceptions of iPad use as a means of language learning. Initially, the survey underwent reliability checks and was piloted before it was administered (Appendix F). It was translated into Arabic which was the students' mother tongue. Arabic translation of the items minimized misunderstanding and misinterpretation. It employed the TRAPD (Translation, Review, Adjudication, Pretesting and Documentation) method. According to The European Social Survey guidelines the TRAPD provides for five procedures for the translation of survey questionnaires: Translation, Review, Adjudication, Pretesting and Documentation (Hoffmeyer-Zlotnik and Warner 2014).

The Arabic translation was done by two independent bilingual native Arab speakers who were Arabic-English language specialists working as Arab faculty members in the same institution as the researcher. "The recommended practice in the European Social Survey (ESS) is independent parallel translation by at least two translators, who each produce a translation of the questionnaire. The target language should be their first language or mother tongue" (Hoffmeyer-Zlotnik and Warner 2014, p. 8). Secondly, the third bilingual specialist from the same department reviewed both translations in collaboration with both translators. The final decision was reached as a result of their collaboration (Hoffmeyer-Zlotnik and Warner 2014). "In addition to the translation, review and adjudication procedures, the translated questionnaire must undergo pretesting" (Hoffmeyer-Zlotnik and Warner 2014, p. 8). Thirdly, the final variant of the questionnaire was pre-tested with another level one group from the same stream and procedures were documented throughout the process. Table 3.7 represents the final variant of the administered questionnaire in English and Arabic:

Final Questionnaire in English and Arabic	
1. iPads are easy to carry 1. الآيباد حمله سهل	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
2. iPads are active language learning tools 2. الآيباد هو من الأدوات الفعالة لتعلم اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
3. iPad apps for language learning are not easy to regulate 3. تطبيقات الآيباد لتعلم اللغة هي ليست سهلة التنظيم	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
4. I am confident using my iPad in class 4. أنا واثق باستخدام الآ يباد في الفصل	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree

	7. Completely agree
5. I am not confident using my iPad for the test 5. أنا لست واثقًا من استخدام الآيباد في الاختبار	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
6. I am confident using my iPad for electronic resources 6. أنا واثق باستخدام الآيباد للمصادر الإلكترونية	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
7. I believe the iPad can develop communication between the students 7. أنا واثق أن الآ باد يمكن أن يطور التواصل بين الطلاب	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
8. I believe the iPad can develop communication between the students and the teacher 8. أنا واثق أن الآ باد يمكن أن يطور التواصل بين الطلاب و المعلم	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree

9. I believe the iPad can be a means of information gaining 9. أنا واثق أن الآ باد يمكن أن يكون وسيلة لاكتساب المعلومات	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
10. I believe the iPad can be a means of information sharing 10. أنا واثق أن اللآيباد يمكن أن يكون وسيلة لمشاركة المعلومات	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
11. I believe the iPad can be a means of language learning 11. أنا واثق أن الآيباد يمكن أن يكون وسيلة لتعلم اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
12. It is difficult to read on the iPad 12. ليس من السهل القراءة على الآيباد	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
13. It is easy to write on the iPad	1. معارض تمامًا 2. معارض غالبًا

13. من السهل الكتابة على الآيباد	3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
14. It is easy to listen on the iPad 14. من السهل الاستماع على الآيباد	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree **7.** Completely agree
15. iPad based tasks provide language learning 15 . الآيباد يوفر المهام الأساسية لتعلم اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
16. iPad based tasks are interesting to do 16. المهام التي تعتمد على الآيباد مثيرة للاهتمام	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
17. iPad based tasks are difficult to share	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض

17. مهام الإعتماد في الآيباد هي صعبة للمشاركة	5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
18. I am satisfied with the availability of iPad language learning applications 18. أنا راض عن توافر الآيباد لتطبيقات تعلم اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
19. I am satisfied with the electronic format of the language learning applications 19. أنا راض عن الشكل الإلكتروني لتطبيقات تعلم اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
20. I am not satisfied with the iPad based assessment applications 20. أنا لست راض عن اعتماد تطبيقات التقييم في الآيباد	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
21. I believe language learning through iPads is productive 21. أعتقد أن تعلم اللغة من خلال الآيباد غير منتجة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا

	7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
22. I believe acquiring language learning skills through iPads is productive 22. أنا واثق من اكتساب مهارات تعلم اللغة من خلال الآيباد غير مثمرة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
23. I believe acquiring literacy skills through iPads is not productive 23. أنا واثق أن اكتساب مهارات القراءة والكتابة من خلال الآيباد غير مثمرة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
24. I don't enjoy using iPad for my language class 24. أنا لم أستمتع باستخدام الآيباد في فصل اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
25. I plan to continue learning English through my iPad 25. أنا أخطط لمواصلة تعلم اللغة الإنجليزية من خلال الآيباد	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا

	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
26. I encourage others to start using iPad for language learning I.26 أنا أشجع الآخرين على البدء في استخدام الآيباد لتعلم اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
27. I feel iPads could enhance language learning effectiveness 27. أشعر بأن الآيباد يمكن أن يعزز فعالية تعلم اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
28. I feel iPads could motivate learners into language learning 28. أشعر بأن الآيباد يمكن أن يحفز المتعلمين في تعلم اللغة	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا 1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
29. I feel iPads could not provide interactive ways to develop language skills 29. أشعر بأن الآيباد لا يمكن أن يوفر طرق تفاعلية لتطوير المهارات اللغوية	1. معارض تمامًا 2. معارض غالبًا 3. معارض قليلاً 4. لا أوافق ولا أعارض 5. موافق قليلاً 6. موافق غالبًا 7. موافق تمامًا

	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree

Table 3.7: English and Arabic Survey

3.6 Reflective Journals

The qualitative analysis were obtained through weekly reflective journal logs that the teachers involved in this study kept to record the procedure of the experiment for all four groups during phase one and two of the experiment (Table 3.8). The two data sources that informed this part of the study were: soft copies of four teachers' weekly written reflections in phase one, which lasted for four weeks, and soft copies of two teachers' weekly written reflections in phase two which lasted for another four weeks. This means, four teachers teaching four groups for four weeks wrote sixteen journals in phase one, and two teachers teaching two groups for another four weeks wrote eight journals in phase two. By the end of the experiment the teachers produced twenty-four reflective journals (Appendix D and Appendix E). "Reflective journals allow for documentation of emergence and bifurcation and embrace participants' involvement in interpretation of data in inherently non-linear ways" (Phelps 2005, p. 37). Reflective practice is evidence based, involves dialogue, links beliefs and practices, and is a way of life (Farrell 2013).

The descriptive journals were standardized through team meetings and contained information about 80 teaching periods with four groups and another 80 teaching periods with two groups (Table 3.8). As the table illustrates, they were divided into three sections. Section one contained information about the work plan; such as, details about the unit, learning outcomes and skills to be taught. In section two, teachers wrote about what they covered within the week. In section three, they reflected on their teaching and students' learning.

Week _____ Unit _____ Learning Outcomes _____ Reading and Writing _____ Speaking and Listening _____ Grammar and Vocabulary _____			
iPad Group 1	iPad Group 2	Textbook Group 1	Textbook Group 2
Day 1 Day 2 Day 3 Day 4 Day 5	Day 1 Day 2 Day 3 Day 4 Day 5	Day 1 Day 2 Day 3 Day 4 Day 5	Day 1 Day 2 Day 3 Day 4 Day 5
The teacher's reflections	The teacher's reflections	The teacher's reflections	The teacher's reflections

Table 3.8: Weekly journals

The journal summaries served as registers of parallels to document and reflect on the research experience as well as the advantages and disadvantages of the methods and ways the material was introduced by the teachers and reproduced by the students. "Reflecting on different aspects of the research process when writing a research journal provides a forum to record concerns which may have otherwise been lost or simply not considered" (Lamb 2013, p. 85). This phase assisted in between-method triangulation and made it possible to capture aspects of the research issue, such as concrete professional routines (Flick, 2006).

3.7 Ethical Considerations

Experimental research with people carries ethical problems and has a moral dimension because of the control exercised over participants' behaviour. However, while this is self-evident in experimental research, ethical dilemmas lurk in any research involving people (Robson, 2005). To minimize the ethical problems this study followed Bryman and Bell's (2007) principles of ethical considerations.

- *Research participants should not be subjected to harm in any ways whatsoever*.

80 students and four teachers participated in this study. Neither students nor teachers were harmed in any way during the study. None of the participants complained about any aspect of the experiment being harmful for their life, learning or teaching. All four groups followed the work plan and covered the same material to minimize harm to the learning process. The study was carried out in students' everyday classroom, hence; minimizing the risk of harm to the participants (Yin 2009). All tests and questionnaires were administered in students' everyday classroom and during students' regular class time to avoid any harm to the teaching and learning process.

- *Respect for the dignity of research participants should be prioritized.*

If looked at the textbook group students as being deprived of using iPads and at iPad group students as being deprived of paper textbooks for their language learning, it must be stated that the participant students in all four groups were informed about the experiment before it commenced and the procedures were explained to them in details. Their participation was not mandatory or forced and it was their decision to participate in the experiment and sign the consent form, which was introduced to them and discussed in details (Table 3.9).

Consent Form

Student ID _____ Date _____

Introduction

- You are being asked to participate in a research study
- You were selected as a participant because you study in level one
- Please read this form and ask any questions that you may have before agreeing to participate in the study.

If you agree to participate in this study, you will be asked to do the following:

- Come to class on time
- Complete all in-class tasks set by the teacher
- Actively participate and work hard to progress in English
- Not discuss anything you do in class with anybody outside the classroom
- Not exchange in-class materials with anybody outside the classroom

Confidentiality

- This study is anonymous
- The records of this study will be kept strictly confidential
- The study will not include any personal information that would make it possible to identify you.

Right to Refuse or Withdraw

- The decision to participate in this study is entirely up to you
- You may refuse to take part in the study without affecting your relationship with the teachers

Right to Ask Questions and Report Concerns

- You have the right to ask questions about this research study any time before, during or after the research
- If you have any further questions about the study, at any time feel free to contact me, [*name*] at [*email*] or by telephone at [*phone number*].

Consent

- Your signature below shows that you have decided to volunteer as a research participant for this study, and that you have read and understood the information provided above.

Student's signature _____

Table 3.9: The consent form

Moreover, they were free to leave the experiment at any time according to the consent forms they signed. None of the participants opted against participating in the experiment before the start of the experiment when the procedures were introduced to them. Neither any of participants decided to leave the experiment after it commenced. The participants' dignity was always prioritized and there were no issues recorded before, during and after the experiment that could affect their dignity in any way.

- *Full consent should be obtained from the participants prior to the study.*

The consent form was introduced and discussed with the study participants before its commencement. Then the participants were asked to sign the consent form (Table 3.9), which acknowledged understanding of the study process.

- *The protection of the privacy of research participants has to be ensured*.

This study kept the confidentiality of its participants. A contact letter of invitation was given to the participants assuring them that their anonymity would be protected indefinitely. The demographic data did not contain participants' names or the class records and remained anonymous to all but the researcher. Ethical standards in the reposting of the data was guaranteed by strictly following Robson's (2005) Reporting Fixed Design Research guidelines (pp. 503-504).

- *Adequate level of confidentiality of the research data should be ensured*.

The experimental design enabled this study to determine the changes in student's commitment to language learning caused by the innovative educational technology and the effect the treatment had on the subjects. However, "[in the experimental research] the researcher has absolutely no interest in linking the person as a unique, named individual to actual behaviour, and the research data can be transferred to a coded, unnamed data sheet" (Cohen, Manion and Morrison 2007, p. 65). Therefore, the research data in this study was number coded before being analysed. Neither qualitative nor quantitative data analysis included research data linking any of the research data, such as test scores, survey answers, reflections or actual behaviour to individual students or teachers. The confidentiality of the research data and anonymity of the participants was protected indefinitely.

- *Any deception or exaggeration about the need, aims and objectives of the research must be avoided*.

The literature review brought together different perspectives of mobile technology use in the field of education. It was wide-ranging considering issues involved in designing, carrying out, analyzing and reporting several types of studies based on technology use in the field of education. It provided an overall structure, while seeking to address some of the complexities in current literature. This was an important task to identify the gap in the literature and was done

without exaggerations to highlight the need for this study. Besides identifying the need, this study tried to clearly discuss the aims and objectives of the research in the Introduction chapter without overstating any aspects of it. It included all the necessary documentation concerning the data collection process and analysis in the Appendixes section and followed the necessary precautions and guidelines to avoid any deception or exaggeration.

- *Affiliations in any forms, sources of funding, as well as any possible conflicts of interests have to be declared*.

This study had no affiliations in any forms, nor was it funded by any organization. It was carried out in the researcher's workplace and had no conflicts of interest in any form.

- *Any type of communication in relation to the research should be done with honesty and transparency*.

Honesty is among the most important ethical considerations in this study. When conducting this research, honesty was its best policy. This study ensured that the approaches, methods, instruments and procedures used to obtain the data were piloted, well thought of and accurate. It also ensured through piloting and double checks that the data was accurately analysed and reported. The thesis was proofread for many times by different professionals in the field and its sections reread to avoid misinterpreted results or biased interpretations.

Chapter Four
Results: Experiment

4.1 Experimental data analysis in phase one and phase two

The aim of this study was to describe the relationship between the use of iPads and paper textbooks in teaching English to beginner level language learners. This research study incorporated true-experimental quantitative methodology and involved 80 randomly chosen participants (out of 250) enrolled in the first year Foundation program in the UAE. Quantitative research is a valuable research paradigm as it allows the researcher to do experiments on smaller samples to make generalizations about the larger populations (Creswell 2012). This study used a Randomized Solomon-four-group design which combined the pretest-posttest control group and posttest-only control group designs (Fraenkel and Wallen 2014). "The randomized Solomon four-group design provides the best control of the threats to internal validity" (Fraenkel and Wallen 2014, p. 268). This design was implemented for 80 teaching periods in each of the four groups in the first phase and another 80 teaching periods in two groups in the second phase to provide control of the threats to internal validity and evaluate the effects of the iPad use on language achievement (Best and Kahn 2003; Wiersma and Jurs 2005).

The quantitative data analysis are well illustrated in Figure 4.1 of the Randomized Solomon four-group design for two experimental phases. As shown in the figure, the quantitative data analysis were obtained through pre-test scores of one iPad group and one textbook group and post-test scores of all four groups: two iPad and two textbook groups in phase one and pre-test and post-test scores of two textbook groups in phase two. It was also obtained through two progress test scores in all four groups in phase one and two progress test scores in two groups in phase two.

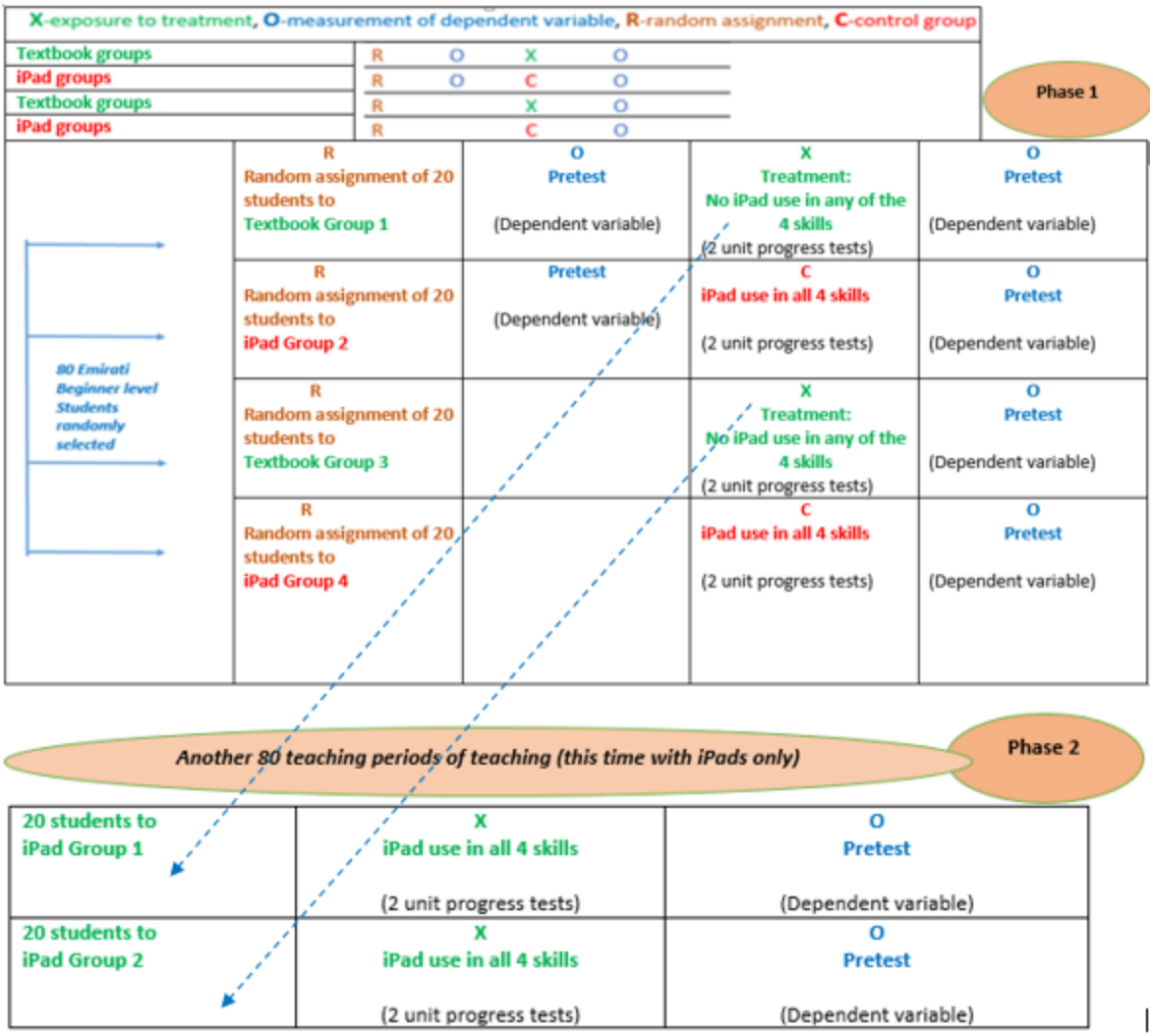


Figure 4.1: Randomized Solomon four-group design for two experimental phases

This study used an experimental method of doing research in which "at least one independent variable was manipulated, other relevant variables were controlled, and their effect on one or more dependent variables was observed" (Farhady 1995, p. 414). In order to assess the relationship between the variables, each variable was identified according to the type of relationship expected for investigation (Farhady 1995). There was one dependent variable and two independent variables. The dependent variable was 'score' in both iPad and textbook groups with two levels (tests) each. The independent variable was 'method': iPad based and textbook based learning. The operational definitions of the variables in concrete terms were the following: the dependent variable of the study, 'score', was the acquisition of language of the beginner level students as measured by the pre-test and post-test, as well as two progress tests from the textbook

vs e-textbook. The independent variable, 'method', was using iPads and electronic materials in iPad groups and using paper materials such as textbooks and supplementary non-electronic materials in textbook groups. "Through the experimental method of research the researcher had enough evidence to claim that a particular change regarding a variable was due to the particular behaviour of another variable" (Farhady 1995, Fraenkel and Wallen, 2014).

Test administrators are responsible for providing descriptive statistics so that all test result users can create a mental picture of how the students performed on the test (Brown 1996). Hence, descriptive statistics were run to provide the numerical representations of how the iPad and textbook groups performed on pre-test and post-test as well as on progress tests (Appendix G).

TESTS	**METHODS**							
	1				**2**			
Phase 1	**Textbook Group 1**				**iPad Group 1**			
Pre-test scores	***Median***	***Mean***	***Std. Deviation***		***Median***	***Mean***	***Std. Deviation***	
	61.50	**61.55**	**2.282**		**61.00**	**61.45**	**2.235**	
Post-test scores	**74.00**	**73.45**	**3.832**	**Min 65**	**79.00**	**77.90**	**4.291**	**Min 69**
				Max 79				**Max 84**
	Textbook Group 2				**iPad Group 2**			
	Median	***Mean***	***Std. Deviation***		***Median***	***Mean***	***Std. Deviation***	
Pre-test scores								
Post-test scores	**73.00**	**73.45**	**3.486**	**Min 68**	**80.50**	**78.90**	**3.796**	**Min 71**
				Max 80				**Max 84**

Table 4.1: Descriptive statistics for pre-test and post-test in phase one

Since this experiment was run through the randomized Solomon four-group design, it involved four groups, with two groups being pre-tested and two not being tested and all four groups then being post-tested to eliminate the possible effect of a pre-test (Fraenkel and Wallen, 2014). Therefore, in Table 4.1**,** textbook group 1 and iPad group 1 have registered pre-test descriptive statistics, whereas, textbook group 2 and iPad group 2 do not have any, since the last two did not take the pre-test. As discussed in Table 4.1, all four groups have post-test results because they all took the post-test at the end of the experiment. The median is 61.50 in the textbook group 1 and 61.00 in the iPad group group 1 for the pre-test and 74.00, 73.00 in textbook groups 1 and 2, vs 79.00, 80.50 in iPad groups 1 and 2 for the post-test. As the results show, the median gradually increases for the post-test in all groups with iPad groups recording higher scores. The means of method 1 for the pre-test and post-test in textbook group 1 are 61.55, 73.45 and for the post-test in the textbook group 2 is 73.45. The means of method 2 for the pre-test and post-test in iPad group 1 are 61.45, 77.90 and for the post-test in iPad group 2 is 78.90. This means that the arithmetic average of method 2 for two tests is higher than the arithmetic average of method 1.

The dispersion of scores for the two methods is estimated by the standard deviation. As shown in Table 4.1, the standard deviation for method 1 in textbook group 1 for the pre-test is 2.282 and for the post-test is 3.832. The standard deviation for method 2 in iPad group 1 for the pre-test is 2.235 and for the post-test is 4.291. The standard deviation for method 1 in textbook group 2 for the post-test is 3.486 and for iPad group 2 is 3.796. The average of the differences of all scores from the mean for two tests is bigger in method 1 than it is in method 2. This means that the test scores in the iPad groups did not vary as widely from each other, as they did in the textbook groups.

TESTS	METHODS							
	1				2			
Phase 1	**Textbook Group 1**				**iPad Group 1**			
	Median	***Mean***	***Std. Deviation***		***Median***	***Mean***	***Std. Deviation***	
Progress Test 1	**72.00**	**71.30**	**2.055**	**Min 67** **Max 76**	**73.50**	**73.75**	**3.007**	**Min 68** **Max 78**
Progress Test 2	**78.00**	**77.95**	**2.114**	**Min 74** **Max 82**	**83.50**	**83.50**	**2.800**	**Min 79** **Max 89**
	Textbook Group 2				**iPad Group 2**			
	Median	***Mean***	***Std. Deviation***		***Median***	***Mean***	***Std. Deviation***	
Progress Test 1	**72.00**	**72.30**	**2.342**	**Min 68** **Max 77**	**73.50**	**73.35**	**2.961**	**Min 68** **Max 79**
Progress Test 2	**79.00**	**78.60**	**1.957**	**Min 75** **Max 81**	**84.00**	**84.15**	**3.281**	**Min 79** **Max 90**

Table 4.2: Descriptive statistics for progress test 1 and progress test 2 in phase one

Descriptive statistics were run to create a mental picture of how the students in four groups performed on two progress tests throughout the experiment in phase one (Table 4.2). As shown in Table 4.2**,** the textbook group 1 grades of 72.00, 78.00 and textbook group 2 grades of 72.00, 79.00, vs iPad group 1 grades of 73.50, 83.50 and iPad group 2 grades of 73.50, 84.00 are the grade points below and above which 50% of the scores fall. As with the pre-test and post-test in Table 4.1, here as well, the median gradually increases for two tests in all groups with iPad groups recording higher scores.

The means of method 1 for two progress tests are 71.30, 77.95 in textbook group 1 and 72.30, 78.60 in textbook group 2. The means of method 2 for two progress tests are 73.75, 83.50 in iPad group 1 and 73.35, 84.15 in iPad group 2. Similar to the pre-test and post-test section, the mean of method 2 for two tests is higher than the mean of method 1.

The standard deviation of method 1 for two progress tests in textbook group 1 are 2.055, 2.114 and 2.342, 1.957 in textbook group 2. The standard deviations for method 2 in iPad group 1 for two progress tests are 3.007, 2.800 and 2.961, 3.281 in iPad group 2. The average of the differences of all scores from the mean for two tests is larger in method 1 than it is in method 2. This means that the test scores in the iPad groups did not vary as widely from each other, as they did in the textbook groups.

The minimum scores in progress test 1 and 2 in textbook group 1 are 67, 74 and 68, 75 in textbook group 2. The minimum scores in progress test 1 and 2 are higher in iPad groups 1 and 2, iPad group 1 having 68, 79 and iPad group 2 having 68, 79 as well. The maximum scores are higher in iPad groups as compared to textbook groups. The maximum scores in progress test 1 and 2 in textbook group 1 are 76, 82 and 77, 81 in textbook group 2. The maximum scores in progress test 1 and 2 are 78, 89 in iPad group 1 and 79, 90 in iPad group 2.

TESTS ***Phase 2***	**METHOD**							
	iPad Group 1				**iPad Group 2**			
Pre-test scores	***Median***	***Mean***	***Std. Deviation***		***Median***	***Mean***	***Std. Deviation***	
	72.50	**72.70**	**2.697**	**Min 68**	**72.50**	**72.50**	**2.565**	**Min 68**
				Max 77				**Max 80**
Post-test scores	**88.00**	**87.90**	**2.673**	**Min 82**	**87.50**	**87.30**	**2.849**	**Min 81**
				Max 91				**Max 92**

Table 4.3: Descriptive statistics for pre-test and post-test in phase two

In phase two the two textbook groups that were exposed to paper textbook based teaching (method 1) in phase one, moved to iPad based teaching (method 2) and were called iPad groups. Both groups took pre-test and post-test and two progress tests during the second phase of the experiment. Descriptive statistics were run to create a mental picture of how the students in two groups performed on the pre-test and post-test (Table 4.3). As Table 4.3 shows, the median of both groups for pre-test is 72.50. It increases for the post-test in both groups to 88.00 and 87.50. The mean scores of both groups for both pre-test and post-test are close to each other as well, iPad group 1 having 72.70 and iPad group 2 having 72.50 for pre-test and 87.90 and 87.30 for post-test. This means that the mean score of iPad based teaching method for two tests is similar in two groups.

The standard deviation of this method for the pre-test in iPad group 1 is 2.697 and 2.565 in iPad group 2. The standard deviations of this method for the post-test in iPad group 1 is 2.673 and 2.849 in iPad group 2. The average of the differences of all scores from the mean for two tests is close in this method, which means that the test scores in two groups did not vary widely from each other.

The minimum and maximum scores of both groups in post-test in phase two are much higher than the groups produced in phase one (Table 4.1). In phase one the minimum score of group 1 was 65, but in phase two its minimum score is 82. In phase one the minimum score of group 2 was 68, but in phase 2 it is 81. In phase one the maximum score of group 1 was 79, but in phase two its maximum score is 91. In phase one the maximum score of group 2 was 80, but in phase 2 it is 92. This means that these two groups did better and scored higher when exposed to method 2, which is iPad based language learning.

TESTS ***Phase 2***	METHODS							
	iPad Group 1				iPad Group 2			
	Median	*Mean*	*Std. Deviation*		*Median*	*Mean*	*Std. Deviation*	
Progress Test 1	**73.00**	**72.95**	**2.800**	**Min 68** **Max 77**	**72.50**	**72.95**	**2.481**	**Min 68** **Max 77**
Progress Test 2	**88.00**	**86.45**	**4.199**	**Min 77** **Max 92**	**87.00**	**86.10**	**3.553**	**Min 78** **Max 90**

Table 4.4: Descriptive statistics for progress test 1 and progress test 2 in phase two

Table 4.4 shows how the students in two iPad groups performed on two progress tests throughout the second phase of the experiment. The iPad group 1 grades of 73.00, 88.00 and iPad group 2 grades of 72.50, 87.00 are the grade points below and above which 50% of the scores fall. The mean scores of iPad based method for two progress tests are 72.95, 86.45 in iPad group 1 and 72.95, 86.10 in iPad group 2. As in the pre-test and post-test section, the arithmetic average of this method for two tests is close in both groups. The standard deviations for two progress tests in iPad group 1 are 2.800, 4.199 and 2.481, 3.553 in iPad group 2.

TESTS Phase 1	Textbook Group 1			
	Median	Mean	Std. Deviation	
Progress Test 1	72.00	71.30	2.055	Min 67 Max 76
Progress Test 2	78.00	77.95	2.114	Min 74 Max 82

TESTS Phase 2	iPad Group 1			
	Median	Mean	Std. Deviation	
Progress Test 1	73.00	72.95	2.800	Min 68 Max 77
Progress Test 2	88.00	86.45	4.199	Min 77 Max 92

	Textbook Group 2			
	Median	Mean	Std. Deviation	
Progress Test 1	72.00	72.30	2.342	Min 68 Max 77
Progress Test 2	79.00	78.60	1.957	Min 75 Max 81

	iPad Group 2			
	Median	Mean	Std. Deviation	
Progress Test 1	72.50	72.95	2.481	Min 68 Max 77
Progress Test 2	87.00	86.10	3.553	Min 78 Max 90

Table 4.5: Comparison of descriptive statistics of two groups in both phases

The minimum and maximum progress test scores of both groups in phase two are higher than the groups scored in phase one (Table 4.5). The results are especially high in both groups for the progress test two in phase two. As shown in Table 4.5, in phase one the minimum progress test 1 score of group 1 was 67, and it was only one point higher in phase two being 68. The group produced similar results with progress test 1 maximum scores, showing maximum score of 76 in phase one and a point higher in phase two. However, this group recorded much higher results in progress test two in phase two as compared to phase one. In phase one the minimum progress test 2 score of group 1 was 74, but it increased to 77 in phase two. In phase one the maximum progress test 2 score of group 1 was 82, but in phase two it jumped 10 points higher to 92.

In phase one the minimum progress test 2 score of group 2 was 68, and it stayed the same in phase two. The group had the same maximum results for progress test one as well in both phases, which was 77. Like group 1, group 2 improved its scores dramatically during progress test two. It had a minimum score of 75 in phase one in progress test 2 and increased it to 78 in phase two. In phase one its maximum score was 81, but in phase two it saw a sharp increase to 90.

"Many of the questions we are interested in when carrying out a study producing quantitative data boil down to whether there are differences between the scores obtained under two conditions, or by two groups" (Robson 2005, p. 439). To see which method was more effective, which exam produced significantly higher grades, and which method–exam interaction yielded significantly higher grades, paired two-group t-test is run (Table 4.6). "The paired two-

group t-test should be used when there are pairs of scores" (Robson 2005, p. 439). The aim of the paired t-test in this study is to determine whether the factors differ from each other in a significant way under the assumptions that the paired differences are independent and normally distributed (Appendix H).

Phase 1	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Differences **Lower**	**Upper**	t	df	Sig.(2-tailed)
Pair 1 – iPad. group 1 **Pre-test –Post-test**	**-16.4**	**2.892**	**.647**	**-17.804**	**-15.096**	**-25.435**	**19**	**.000**
Pair 2 – textbook group 1 **Pre-test –Post-test**	**-11.9**	**2.382**	**.533**	**-13.015**	**-10.785**	**-22.342**	**19**	**.000**

Table 4.6: Phase one pre-test and post-test results

The null hypothesis must be fixed to see which test, pre-test or post-test, yielded higher results.

Ho: $\mu 1 = \mu 2$

H1: $\mu 1 < \mu 2$

As shown in Table 4.6, the p value is equal to half of the significance level, which is 0 and 0 is less than the significance level .05, therefore Ho should be rejected and the alternative hypothesis should be accepted that $\mu 1 < \mu 2$, meaning that post-test results were significant.

Phase 1	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Differences **Lower**	**Upper**	t	df	Sig.(2-tailed)
Pair 1__ Progress test 1								
iPad G. 1-	**73.75**	**3.007**	**.672**	**-1.510**	**2.310**	**.424**	**38**	**.674**
iPad G. 2	**73.35**	**2.961**	**.662**	**-1.510**	**2.310**		**37.991**	**.674**
Pair 2__ Progress test 2								
iPad G. 1 –	**83.50**	**2.800**	**.626**	**-2.603**	**1.303**	**- 674**	**38**	**.504**
iPad G. 2	**84.15**	**3.281**	**.734**	**-2.604**	**1.304**		**37.084**	**.505**
Pair 3__ Progress test 1								
textbook G. 1 –	**71.30**	**2.055**	**.459**	**-2.410**	**.410**	**1.436**	**38**	**.159**
textbook G. 2	**72.30**	**2.342**	**.524**	**-2.411**	**.411**		**37.367**	**.159**
Pair 4__ Progress test 2								
textbook G. 1 –	**77.95**	**2.114**	**.473**	**-1.954**	**.654**	**-1.009**	**38**	**.319**
textbook G. 2	**78.60**	**1.957**	**.438**	**-1.955**	**.655**		**37.776**	**.319**
Pair 5__ Progress test 1								
iPad G. 1 –	**73.75**	**3.007**	**.672**	**.802**	**4.098**	**3.009**	**38**	**.005**
textbook G. 1	**71.30**	**2.055**	**.459**	**.794**	**4.106**		**33.568**	**.005**
Pair 6__ Progress test 2								
iPad G. 1 –	**83.50**	**2.800**	**.626**	**3.962**	**7.138**	**7.073**	**38**	**.000**
textbook G. 1	**77.95**	**2.114**	**.473**	**3.958**	**7.142**		**35.350**	**.000**
Pair 7__ Progress test 1								
iPad G. 2 –	**73.35**	**2.961**	**.662**	**-.659**	**2.759**	**1.244**	**38**	**.005**
textbook G. 2	**72.30**	**2.342**	**.524**	**-.662**	**2.762**		**36.086**	**.005**
Pair 8__ Progress test 2								
iPad G. 2 –	**84.15**	**3.281**	**.734**	**3.821**	**7.279**	**6.496**	**38**	**.000**
textbook G. 2	**78.60**	**1.957**	**.438**	**3.808**	**7.292**		**31.004**	**.000**

Table 4.7: Phase one progress test results for all groups

The null hypothesis is fixed for each paired test to see which test, progress test 1 or progress test 2, produced higher results (Table 4.7).

- *Pair 1__ Progress test 1 in two iPad groups: iPad group 1 and iPad group 2*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .674 (÷ 2 =.337) and .337 is higher than the significance level .05, therefore Ho should be accepted μ 1= μ 2 and the alternative hypothesis should be rejected μ 1< μ 2, meaning that progress test 1 results were not significantly different in two iPad groups.

- *Pair 2__ Progress test 2 in two iPad groups: iPad group 1 and iPad group 2*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .504 (÷ 2 =.252) and .252 is higher than the significance level .05, therefore Ho should be accepted μ 1= μ 2 and the alternative hypothesis should be rejected μ 1< μ 2, meaning that progress test 2 results were not significantly different in two iPad groups.

- *Pair 3__ Progress test 1 in two textbook groups: textbook group 1 and textbook group 2*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .159 (÷ 2 =.0795) and .0795 is higher than the significance level .05, therefore Ho should be accepted μ 1= μ 2 and the alternative hypothesis should be rejected μ 1< μ 2, meaning that progress test 1 results were not significantly different in two textbook groups.

- *Pair 4__ Progress test 2 in two textbook groups: textbook group 1 and textbook group 2*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .319 (÷ 2 =.1595) and .1595 is higher than the significance level .05, therefore Ho should be accepted μ 1= μ 2 and the alternative hypothesis should be rejected μ 1< μ 2, meaning that progress test 2 results were not significantly different in two textbook groups.

The statistical analysis of two progress tests in four groups showed no significant difference in scores within iPad and textbook groups. This means that groups were homogeneous and the treatment worked equally well within both iPad groups as well as within both textbook groups. To cross check and see which groups produced higher results in progress test 1 and progress test 2, iPad and textbook groups must be paired up and a hypothesis must be fixed for each pair (Table 4.7).

- *Pair 5__ Progress test 1 in one iPad group and one textbook group: iPad group 1 and textbook group 1*

Ho: μ 1= μ 2

H1: μ 1> μ 2

The p – value is .005 and .005 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1> μ 2, meaning that progress test 1 results were significantly higher in iPad group 1.

- *Pair 6__ Progress test 2 in one iPad group and one textbook group: iPad group 1 and textbook group 1*

Ho: μ 1= μ 2

H1: μ 1> μ 2

The p – value is .000 and .000 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1> μ 2, meaning that progress test 2 results were significantly higher in iPad group 1.

- *Pair 7__ Progress test 1 in one iPad group and one textbook group: iPad group 2 and textbook group 2*

Ho: μ 1= μ 2

H1: μ 1> μ 2

The p – value is .005 and .005 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1> μ 2, meaning that progress test 1 results were significantly higher in iPad group 2.

- *Pair 8__ Progress test 2 in one iPad group and one textbook group: iPad group 2 and textbook group 2*

Ho: μ 1= μ 2

H1: μ 1> μ 2

The p – value is .000 and .000 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1> μ 2, meaning that progress test 2 results were significantly higher in iPad group 2.

Phase one progress test results for iPad groups vs textbook groups showed significantly high progress test 1 and progress test 2 results in favour of iPad groups. This means both iPad groups recorded higher language progression as compared to two textbook groups.

To see if the two textbook groups from phase one showed higher progression in phase two when moved to iPad based language learning, phase one and phase two results for those two groups must be paired up and a hypothesis fixed (Table 4.8).

Phase 1 and 2	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Differences **Lower**	**Upper**	t	df	Sig.(2-tailed)
Pair 1_textbook-ipad G 1 **Progress test 1- 2.1**	**-1.650**	**3.329**	**.744**	**-3.208**	**-.092**	**-2.217**	**19**	**.039**
Pair 2_ textbook-iPad G 1 **Progress test 2- 2.2**	**-8.500**	**4.513**	**1.009**	**-10.612**	**-6.388**	**-8.423**	**19**	**.000**
Phase 1 and 2	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Differences **Lower**	**Upper**	t	df	Sig.(2-tailed)
Pair 3_textbook-iPad G 2 **Progress test 1- 2.1**	**-.650**	**1.348**	**.302**	**-1.281**	**-.019**	**-2.156**	**19**	**.044**
Pair 4_textbook-iPad G 2 **Progress test 2- 2.2**	**-7.500**	**2.875**	**.643**	**-8.845**	**-6.155**	**-11.668**	**19**	**.000**

Table 4.8: Phase one and two progress test results for two experimental groups

- *Pair 1__ Progress test 1 in textbook group 1 in phase one and the same group in phase two called iPad group 1: Progress test 1 and 2.1*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .039 and .039 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1< μ 2, meaning that progress test 1 results in phase two were significantly higher in group 1 in phase two.

- *Pair 2__ Progress test 2 in textbook group 1 in phase one and the same group in phase two called iPad group 1: Progress test 2 and 2.2*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .000 and .000 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1< μ 2, meaning that progress test 2 results in phase two were significantly higher in group 1 in phase two.

- *Pair 3__ Progress test 1 in textbook group 2 in phase one and the same group in phase two called iPad group 2: Progress test 1 and 2.1*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .044 and .044 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1< μ 2, meaning that progress test 1 results in phase two were significantly higher in group 2 in phase two.

- *Pair 4__ Progress test 2 in textbook group 2 in phase one and the same group in phase two called iPad group 2: Progress test 2 and 2.2*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .000 and .000 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1< μ 2, meaning that progress test 2 results in phase two were significantly higher in group 2 in phase two.

The statistical analysis showed that both groups presented higher progress test results in phase two when exposed to iPads as compared to phase one when exposed to paper books.

Phase 1 and 2	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Differences		t	df	Sig.(2-tailed)
				Lower	**Upper**			
Pair 1_ textbook-iPad G 1 **Post-test 1- 2.1**	**-14.450**	**3.379**	**.756**	**-16.031**	**-12.869**	**-19.124**	**19**	**.000**
Pair 2_ textbook-iPad G 2 **Post-test 1-2.1**	**-13.850**	**3.911**	**.874**	**-15.680**	**-12.020**	**-15.839**	**19**	**.000**

Table 4.9: Phase one and two post-test results for two groups

To see the final results of both groups the post-tests from two phases must be paired up and hypothesis set (Table 4.9).

- *Pair 1__ Post-test 1 in textbook group 1 in phase one and the same group in phase two called iPad group 1: Post-test 1 and 2.1*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .000 and .000 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1< μ 2, meaning that post-test 2.1 results in phase two were significantly higher in group 1 in phase two.

- *Pair 2__ Post-test 1 in textbook group 2 in phase one and the same group in phase two called iPad group 2: Post-test 1 and 2.1*

Ho: μ 1= μ 2

H1: μ 1< μ 2

The p – value is .000 and .000 is less than the significance level .05, therefore Ho should be rejected μ 1= μ 2 and the alternative hypothesis should be accepted μ 1< μ 2, meaning that post-test 2.1 results in phase two were significantly higher in group 2 in phase two.

To sum up, both descriptive statistics and paired t-test results talked in favour of iPad groups in both phases of the experiment. According to the descriptive statistics results the students studying in iPad groups in both phases recorded the highest minimum and maximum

scores in post-tests and two progress tests as compared to students studying in textbook groups. Phase two results saw a sharp increase when those students in textbook groups started learning English paperless. Their grades improved significantly and the minimum and maximum progress test scores of both groups in phase two recorded higher language progression than the groups had in phase one while studying with paper textbooks. According to the paired t-test results, which was run for both phases to determine whether the factors differ from each other in a significant way under the assumptions that the paired differences are independent and normally distributed, showed that progress test 1 and 2 were not significantly different in iPad groups. Nor they were significantly different in textbook groups. According to these results all four groups developed their English language proficiency throughout the study. Paperless learning with the help of the electronic textbooks and online materials, as well as the paper textbooks and paper based materials helped students to progress in their language learning. However, the progress rates were different between the iPad and textbook groups. Progress test results were significantly higher in iPad groups as compared to textbook groups, meaning that paperless learning assisted in better language achievement. Students mastered the language material that was taught through four units better by the help of the iPads and online applications as compared to paperback textbooks and paper based materials in the first phase of the experiment. The t-test results were also in favour of paperless learning in the second phase of the experiment when the two textbook groups moved to paperless learning and were called iPad groups. According to the t-test calculations both groups produced higher progress test results in phase two as compared to phase one. This means that though the students showed high language achievement through both methods of learning, they progressed higher when exposed to iPads. So it can be stated that in phase one the two iPad groups that used iPads for their language learning demonstrated higher language achievement results as compared to the two textbook groups that used paper textbooks for their language learning. Moreover, the two textbook groups that used paper textbooks in phase one showed higher language achievement results during phase two when studying with iPads as compared to their phase one results. To sum up, according to the statistical analysis of this study, iPad based language learning is more productive and yields higher language achievement than textbook based language learning.

Chapter Five

Results: Survey

5.1 Survey data analysis in phase one and phase two

The aim of this section was to answer the second and third research questions of the study. A cross-sectional survey questionnaire, wholly composed of fixed-choice questions was administered in two phases. The survey collected data through a questionnaire from predetermined population, that is to say, students from four groups under experiment: from two iPad groups in the first phase and two iPad groups in the second phase.

Arabic translations of the items were also added to minimize misunderstanding and misinterpretation. It employed the TRAPD (Translation, Review, Adjudication, Pretesting and Documentation) method. The European Social Survey guidelines provide for five procedures for the translation of survey questionnaires, which are, Translation, Review, Adjudication, Pretesting and Documentation (Hoffmeyer-Zlotnik and Warner 2014).

Factors	*Items*	*Content*	*Factor loading*
Self-regulation	SLFREG 01	iPads are easy to **carry**	.376
	SLFREG 02	iPads are **active** language learning tools	.620
	SLFREG 03	iPad apps for language learning are not **easy** to regulate	.733
Self-efficacy	SLFEF 01	I am confident using my iPad **in class**	.409
	SLFEF 02	I am not confident using my iPad **for the test**	.392
	SLFEF03	I am confident using my iPad for **electronic resources**	.416
Interactive learning environments	INTLRENV 01	I believe the iPad can develop **communication between the students**	.659
	INTLRENV 02		.893
	INTLRENV 03	I believe the iPad can develop **communication between the students and the teacher**	.856
	INTLRENV 05	I believe the iPad can be a means of **information gaining**	.875
	INTLRENV 06	I believe the iPad can be a means of **information sharing**	.746
	NTLRENV 07	I believe the iPad can be a means of **language learning**	.875
		I believe Language learning with iPads is **interactive**	
Ease of iPad use	EASEUSE 01	It is difficult to **read** on the iPad	.501
	EASEUSE 02	It is easy to **write** on the iPad	.344
	EASEUSE 03	It is easy to **listen** on the iPad	.576
iPad based tasks	IPDTSK 01	iPad based tasks provide quick **language learning**	.436
	IPDTSK 02	iPad based tasks are **interesting** to do	.421
	IPDTSK 03	iPad based tasks are difficult to **share**	.433
Perceived satisfaction	SATISF 01	I am satisfied with the **availability** of iPad language learning applications	.534
	SATISF 02	~~I am not satisfied with the electronic **format** of the language learning applications~~	.140
	SATISF 03	I am not satisfied with the iPad based **assessment** applications	.538
Perceived usefulness	USEFLNS 01	I believe **language learning** through iPads is productive	595
	USEFLNS 02	I believe acquiring **language learning skills** through iPads is productive	595
	USEFLNS 03	I believe acquiring **literacy skills** through iPads is not productive	.595
Motivation	MOTIV 01	I don't **enjoy** using iPad for my language class	.354
	MOTIV 02	I **plan** to continue learning English through my iPad	.441
	MOTIV 03	I **encourage** others to start using iPad for language learning	.438
Learning effectiveness	LRNEFFCT 01	I feel iPads could enhance language learning **effectiveness**	.437
	LRNEFFCT 02	I feel iPads could **motivate** learners into language learning	.385
	LRNEFFCT 03	I feel iPads could not provide **interactive** ways to develop language skills	.385

Table 5.1: Initial factor analysis

During the experiment the survey was administered through two phases inside the students' usual classrooms by their teachers and during the common teaching time. Therefore, there were no threats to the validity of instrumentation process in the survey that could cause students to respond differently from how they might otherwise respond (Fraenkel and Wallen 2014). After 80 responses were collected in two phases, factor analysis was run to identify traits from the administered question-level data. Confirmatory factor analysis was done for each of the predetermined factors (Table 5.1). Factors were rotated by applying Varimax method. Each item

was loaded with a score greater than 0.3. As shown in Table 5.1, all factors were retained except one loading 0.140 which was less than 0.3. The excluded item was in the factor called "Perceived satisfaction" and was numbered as SATISF02. The item was excluded (Table 5.2).

Factors	***Items***	***Content***	***Factor loading***
Self-regulation	SLFREG 01	iPads are easy to **carry**	.376
	SLFREG 02	iPads are **active** language learning tools	.620
	SLFREG 03	iPad apps for language learning are not **easy** to regulate	.733
Self-efficacy	SLFEF 01	I am confident using my iPad **in class**	.409
	SLFEF 02	I am not confident using my iPad **for the test**	.392
	SLFEF03	I am confident using my iPad for **electronic resources**	.416
Interactive learning environments	INTLRENV 01	I believe the iPad can develop **communication between the students**	.659
	INTLRENV 02		.893
	INTLRENV 03	I believe the iPad can develop **communication between the students and the teacher**	.856
	INTLRENV 05	I believe the iPad can be a means of **information gaining**	.875
	INTLRENV 06	I believe the iPad can be a means of **information sharing**	.746
	NTLRENV 07	I believe the iPad can be a means of **language learning**	.875
		I believe Language learning with iPads is **interactive**	
Ease of iPad use	EASEUSE 01	It is difficult to **read** on the iPad	.501
	EASEUSE 02	It is easy to **write** on the iPad	.344
	EASEUSE 03	It is easy to **listen** on the iPad	.576
iPad based tasks	IPDTSK 01	iPad based tasks provide quick **language learning**	.436
	IPDTSK 02	iPad based tasks are **interesting** to do	.421
	IPDTSK 03	iPad based tasks are difficult to **share**	.433
Perceived satisfaction	SATISF 01	I am satisfied with the **availability** of iPad language learning applications	.534
	SATISF 02		
	SATISF 03	I am not satisfied with the iPad based **assessment** applications	.538
Perceived usefulness	USEFLNS 01	I believe **language learning** through iPads is productive	595
	USEFLNS 02	I believe acquiring **language learning skills** through iPads is productive	595
	USEFLNS 03	I believe acquiring **literacy skills** through iPads is not productive	.595
Motivation	MOTIV 01	I don't **enjoy** using iPad for my language class	.354
	MOTIV 02	I **plan** to continue learning English through my iPad	.441
	MOTIV 03	I **encourage** others to start using iPad for language learning	.438
Learning effectiveness	LRNEFFCT 01	I feel iPads could enhance language learning **effectiveness**	.437
	LRNEFFCT 02	I feel iPads could **motivate** learners into language learning	.385
	LRNEFFCT 03	I feel iPads could not provide **interactive** ways to develop language skills	.385

Table 5.2: Final factor analysis

The overall reliability of all 29 items of the survey is 0.808, which is greater than 0.7 and 0.7 is the minimum. This means the instrument is reliable. KMO and Bartlett's test of sampling adequacy showed statistics value 0.805 with p value = 0, which means the sample size was adequate for running the factor analysis. Exploratory factor analysis was done using principal

component analysis method. Based on the eigenvalues greater than 1, 5 factors were extracted. These factors were rotated using Varimax method. Small coefficient with absolute value less than 0.3 were suppressed (Appendix I).

Factors	Groups in phase 1 and 2	Number	Mean	Std. deviation	Sig. value
Self-regulation	iPad Groups	40	6.6083	.36893	.142
	iPad Groups	40	6.7167	.27786	
Self-efficacy	iPad Groups	40	6.4667	.48803	.768
	iPad Groups	40	6.5000	.51750	
Interactive learning environments	iPad Groups	40	6.7333	.29187	.103
	iPad Groups	40	6.6042	.40065	
Ease of iPad use	iPad Groups	40	6.6083	.26026	.155
	iPad Groups	40	6.5000	.39943	
iPad based tasks	iPad Groups	40	6.8000	.38895	.051
	iPad Groups	40	6.5750	.60500	
Perceived satisfaction	iPad Groups	40	4.0125	.21145	.317
	iPad Groups	40	4.0625	.23170	
Perceived usefulness	iPad Groups	40	6.7625	.46668	.792
	iPad Groups	40	6.7375	.37532	
Motivation	iPad Groups	40	6.9250	.17683	.189
	iPad Groups	40	6.8500	.31078	
Learning effectiveness	iPad Groups	40	4.9917	.05270	.051
	iPad Groups	40	4.9500	.12054	

Table 5.3: Comparison of attitudes between iPad groups in phase 1 and iPad groups in phase 2

After the factor analysis a comparison of attitudes towards using iPads for language learning was carried out comparing 40 iPad group students' responses from phase one with 40 iPad group students' responses from phase two (Table 5.3). The aim of this statistical calculation was to see if the responses were significantly different between the two phases and if the students from phase one had different experience and attitudes towards the iPad use in comparison with the phase two students. As shown in Table 5.3, the sig. value for all factors is greater than 0.05, which means there is no difference between the iPad group answers in phase one and iPad group

answers in phase two for any of the factors and the attitudes towards using iPads for language learning is similar in all four groups within both phases:

- Self-regulation .142 > .05
- Self-efficacy .768 > .05
- Interactive learning environments .103 > .05
- Ease of iPad use .155 > .05
- iPad based tasks .051 > .05
- Perceived satisfaction .317 > .05
- Perceived usefulness .792 > .05
- Motivation .189 > .05
- Learning effectiveness .051 > .05

	Survey 9 factors								
	Self-regulation	**Self-efficacy**	**Interactive learning environ.**	**Ease of iPad use**	**iPad based tasks**	**Perceived satisf.**	**Perceived usefulness**	**Motivation**	**Learning effective.**
N	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**	**80**
Mean	**6.6625**	**6.4833**	**6.6688**	**6.5542**	**6.6875**	**4.0375**	**6.7500**	**6.8875**	**4.9708**
Std. dev.	**.32906**	**.50007**	**.35429**	**.33937**	**.51788**	**.22183**	**.42097**	**.25405**	**.09478**
Minimum	**5.33**	**5.33**	**5.50**	**5.00**	**5.00**	**3.50**	**5.00**	**6.00**	**4.67**
Maximum	**7.00**	**7.00**	**7.00**	**7.00**	**7.00**	**4.50**	**7.00**	**7.00**	**5.00**

Table 5.4: Comparison of attitudes in two phases with four groups

After the comparison of attitudes towards using iPads for language learning was carried out comparing 40 iPad group students' responses from phase one with 40 iPad group students' responses from phase two, another comparison of attitudes was carried out this time using both phases with 80 students responses together as one. The aim of this statistical calculation was to

see the minimum and maximum grades of the factors and to identify the most and least favoured factors.

As shown in Table 5.4, out of 7 scale questionnaire, the average minimum score is 5, which is above the average 4.

8. Completely disagree
9. Mostly disagree
10. Slightly disagree
11. Neither agree nor disagree
12. **Slightly agree**
13. Mostly agree
14. Completely agree

The highest minimum score among 9 factors is 5 (slightly agree) and it is registered in the "Motivation" factor with the highest mean score of 6.8875, which also shows the highest maximum score of 7 (completely agree). The lowest minimum score among 9 factors is 3.50 (between slightly disagree and neither agree nor disagree) and it is registered in the "perceived satisfaction" factor, which also shows the lowest maximum score of all, 4.50 (between neither agree nor disagree and slightly agree). This means most of the students who took the questionnaire thought that iPads motivated them into language learning. However, they stayed neutral when it came to their satisfaction about using iPads for their language learning.

Test of normality was done on self-efficacy, self-regulation, interactive learning environments, ease of use, iPad based tasks, perceived usefulness, perceived satisfaction, motivation and learning effectiveness (Table 5.5).

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Interactive learning	.216	80	.000	.852	80	.000
Self-efficacy	.212	80	.000	.858	80	.000
Satisfaction	.430	80	.000	.606	80	.000
Usefulness	.399	80	.000	.645	80	.000
IPad based tasks	.377	80	.000	.657	80	.000
Motivation	.471	80	.000	.504	80	.000
Ease of use	.305	80	.000	.775	80	.000
LRNEFFECT	.533	80	.000	.317	80	.000
Lilliefors Significance Correction						

Table 5.5: Test of Normality

As Table 5.5 shows, the variables do not follow normal analysis. All Sig. figures are less than .05, which means variables are not normal. Because the variables were not normal, parametric regression analysis was not applicable. Since the aim of the research was to establish a path model, Structural Equation Modeling (SEM) was done using the software AMOS (Figure 5.1).

H1: Perceived self-efficacy has positive predictive value for perceived satisfaction toward iPads as language learning tools.
H2: Perceived self-efficacy has positive predictive value for perceived usefulness toward iPads as language learning tools.
H3: Perceived self-regulation has positive predictive value for perceived satisfaction toward iPads as language learning tools.
H4: Perceived self-regulation has positive predictive value for perceived usefulness toward iPads as language learning tools.
H5: Interactive learning environment have positive predictive value for perceived satisfaction toward iPads as language learning tools.
H6: Interactive learning environments have positive predictive value for perceived usefulness toward iPads as language learning tools.
H7: Perceived ease of use has positive predictive value for perceived satisfaction toward iPads as language learning tools.
H8: Perceived ease of use has positive predictive value for perceived usefulness toward iPads as language learning tools.
H9: iPad based tasks have positive predictive value for perceived satisfaction toward iPads as language learning tools.
H10: iPad based tasks have positive predictive value for perceived usefulness toward iPads as language learning tools.
H11: Perceived satisfaction has positive predictive value for learner motivation toward iPads as language learning tools.
H12: Perceived usefulness has positive predictive value for learner motivation toward iPads as language learning tools.
H13: Perceived satisfaction has positive predictive value for the effectiveness of iPads as learning tools.
H14: Perceived usefulness has positive predictive value for the effectiveness of iPads as learning tools.
H15: Learner motivation has positive predictive value for the effectiveness of iPads as learning tools.

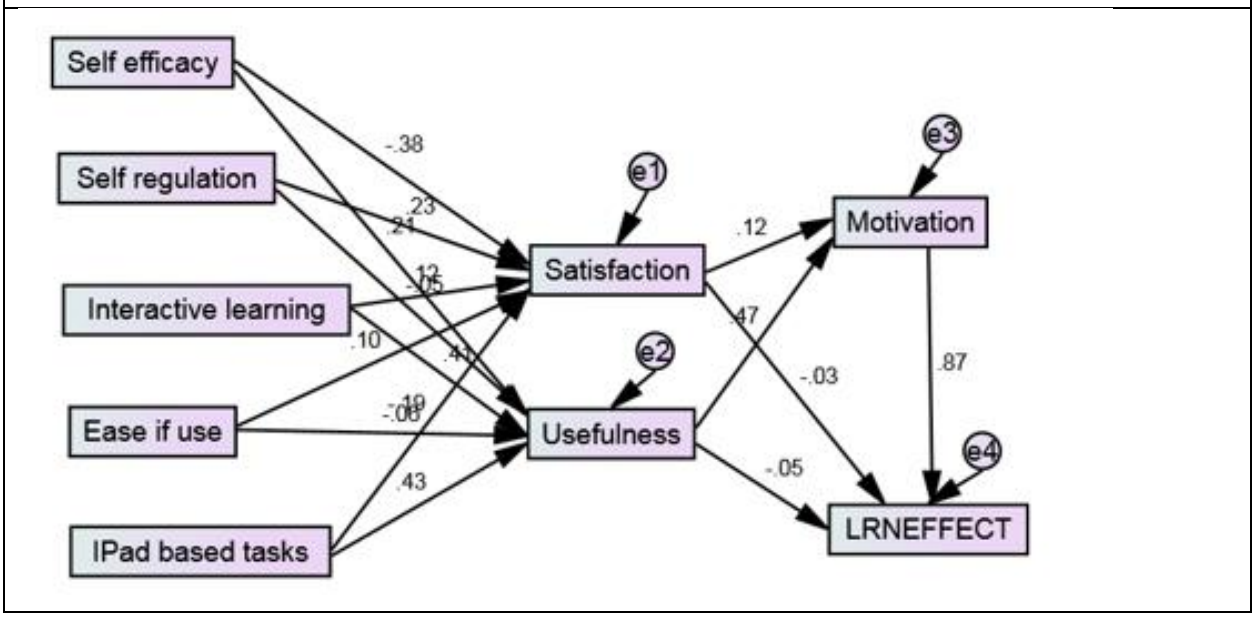


Figure 5.1: Path Model

			Estimate	S.E.	C.R.	**P**	Label
SATISF	<---	SLFEF	**-.177**	.045	-3.933	*******	par_1
SATISF	<---	SLFREG	**.163**	.068	2.385	**.017**	par_2
USEFLN	<---	INTLERN	**.415**	.089	4.670	*******	par_3
SATISF	<---	INTLERN	**.078**	.063	1.229	**.219**	par_4
USEFLN	<---	EASU	**-.067**	.093	-.722	**.470**	par_5
USEFLN	<---	IPDTSK	**.299**	.061	4.910	*******	par_6
SATISF	<---	EASU	**.068**	.066	1.032	**.302**	par_7
SATISF	<---	IPDTSK	**-.083**	.043	-1.913	**.054**	par_8
USEFLN	<---	SLFEF	**.152**	.063	2.411	**.016**	par_14
USEFLN	<---	SLFREG	**-.053**	.096	-.550	**.582**	par_15
MOTIV	<---	USEFLN	**.321**	.068	4.696	*******	par_10
MOTIV	<---	SATISF	**.123**	.107	1.156	**.247**	par_11
LRNEFFECT	<---	USEFLN	**-.012**	.017	-.715	**.474**	par_9
LRNEFFECT	<---	SATISF	**-.013**	.024	-.538	**.590**	par_12
LRNEFFECT	<---	MOTIV	**.329**	.025	13.020	*******	par_13

Table 5.6: Regression Weights

After that, the regression weights were calculated and hypothesis were set (Table 5.6).

Pair 1

- Ho: Perceived self-efficacy has no effect on perceived satisfaction.

  H1: Perceived self-efficacy has positive effect on perceived satisfaction.

$r = 0$

$r > 0$

$r = -.177$

$p < .05$

P = ******* in Table 5.5 means that the probability of getting a critical ratio as large as 3.933 in absolute value is less than 0.001. In other words, the regression weight for the variable SLFEF in the prediction of satisfaction is significantly different from zero at the 0.001 level (two-tailed). So, the null hypothesis is rejected and the alternative hypothesis, H1 is accepted. Though Ho is rejected, r shows negative result of -.177, meaning it is partially accepted. This signifies that perceived self-efficacy has negative effect on perceived satisfaction. When self-efficacy increases satisfaction decreases. This would mean that students expected more functionality than they had been getting from iPads.

Pair 2

- Ho: Self-regulation has no effect on perceived satisfaction.

  H1: Self-regulation has positive effect on perceived satisfaction.

r =0

r > 0

r = .163

p < .05

P = .017. The null hypothesis is rejected and the alternative hypothesis, H1 is accepted. Self-regulation has positive effect on perceived satisfaction.

Pair 3

- Ho: The interactive learning environment has no effect on perceived usefulness.

  H1: The interactive learning environment has positive effect on perceived usefulness.

r =0

r > 0

r = .415

p < .05

P = *****.** The null hypothesis is rejected and the alternative hypothesis, H1 is accepted. The interactive learning environment has positive effect on perceived usefulness.

Pair 4

- Ho: The interactive learning environment has no effect on perceived satisfaction.
  H1: The interactive learning environment has positive effect on perceived satisfaction.

r =0

r > 0

r = .078

p > .05

P = .219. The null hypothesis is accepted and the alternative hypothesis, H1 is rejected. The interactive learning environment has no effect on perceived satisfaction.

Pair 5

- Ho: The iPad ease of use has no effect on perceived usefulness.
  H1: The iPad ease of use has positive effect on perceived usefulness.

r =0

r > 0

r = -.067

p > .05

P = .470. The null hypothesis is accepted and the alternative hypothesis, H1 is rejected. The iPad ease of use has positive effect on perceived usefulness. Because r shows negative result of -.067, H1 it is partially accepted. This signifies that iPad ease of use has negative effect on perceived usefulness.

Pair 6

- Ho: iPad based tasks have no effect on perceived usefulness.

  H1: iPad based tasks have positive effect on perceived usefulness.

r =0

r > 0

r = .299

p < .05

P = *****.** The null hypothesis is rejected and the alternative hypothesis, H1 is accepted. iPad based tasks have positive effect on perceived usefulness.

Pair 7

- Ho: iPad ease of use has no effect on perceived satisfaction.

  H1: iPad ease of use has positive effect on perceived satisfaction.

r =0

r > 0

r = .068

p > .05

P = .302. The null hypothesis is accepted and the alternative hypothesis, H1 is rejected. iPad ease of use has no effect on perceived satisfaction.

Pair 8

- Ho: iPad based tasks have no effect on perceived satisfaction.

  H1: iPad based tasks have positive effect on perceived satisfaction.

r =0

r > 0

r = -.083

p < .05

P = .054. The null hypothesis is rejected and the alternative hypothesis, H1 is accepted. iPad based tasks have positive effect on perceived satisfaction. Because r = -.083, it will be partially accepted, meaning iPad based tasks have negative effect on perceived satisfaction.

Pair 9

- Ho: Self-efficacy has no effect on perceived usefulness.

  H1: Self-efficacy has positive effect on perceived usefulness.

r = 0

r > 0

r = .152

p < .05

P = .016. The null hypothesis is rejected and the alternative hypothesis, H1 is accepted. Self-efficacy has positive effect on perceived usefulness.

Pair 10

- Ho: Self-regulation has no effect on perceived usefulness.

  H1: Self-regulation has positive effect on perceived usefulness.

r = 0

r > 0

r = -.053

p > .05

P = .582. The null hypothesis is accepted and the alternative hypothesis, H1 is rejected. Since r = -0.53, it is partially accepted meaning, self-regulation has negative effect on perceived usefulness.

Pair 11

- Ho: iPad usefulness has no effect on motivation.

  H1: iPad usefulness has positive effect on motivation.

r = 0

r > 0

r = .321

p < .05

P = *******. The null hypothesis is rejected and the alternative hypothesis, H1 is accepted. iPad usefulness has positive effect on motivation.

Pair 12

- Ho: Perceived satisfaction has no effect on motivation.

  H1: Perceived satisfaction has positive effect on motivation.

r = 0

r > 0

r = .123

p > .05

P = .247. The null hypothesis is accepted and the alternative hypothesis, H1 is rejected. Perceived satisfaction has no effect on motivation.

Pair 13

- Ho: Perceived usefulness has no effect on learning effectiveness.

  H1: Perceived usefulness has positive effect on learning effectiveness.

r = 0

r > 0

r = -.012

p > .05

P = .474. The null hypothesis is accepted and the alternative hypothesis, H1 is rejected. Perceived usefulness has no effect on learning effectiveness. Since, r = -.012 it is partially accepted, meaning perceived usefulness has negative effect on learning effectiveness.

Pair 14

- Ho: Perceived satisfaction has no effect on learning effectiveness.

  H1: Perceived satisfaction has positive effect on learning effectiveness.

r = 0

r > 0

r = -.013

p > .05

P = .590. The null hypothesis is accepted and the alternative hypothesis, H1 is rejected. Perceived satisfaction has positive effect on learning effectiveness. Since, r = -.013 it is partially accepted, meaning perceived satisfaction has negative effect on learning effectiveness.

Pair 15

- Ho: Motivation has no effect on learning effectiveness.

  H1: Motivation has positive effect on learning effectiveness.

r = 0

r > 0

r = .329

p < .05

P = ***. The null hypothesis is rejected and the alternative hypothesis, H1 is accepted. Motivation has positive effect on learning effectiveness.

Research hypothesis
H1: Perceived self-efficacy has positive predictive value for perceived satisfaction toward iPads as language learning tools.
H2: Perceived self-efficacy has positive predictive value for perceived usefulness toward iPads as language learning tools.
H3: Perceived self-regulation has positive predictive value for perceived satisfaction toward iPads as language learning tools.
H4: Perceived self-regulation has positive predictive value for perceived usefulness toward iPads as language learning tools.
H5: Interactive learning environment have positive predictive value for perceived satisfaction toward iPads as language learning tools.
H6: Interactive learning environments have positive predictive value for perceived usefulness toward iPads as language learning tools.
H7: Perceived ease of use has positive predictive value for perceived satisfaction toward iPads as language learning tools.
H8: Perceived ease of use has positive predictive value for perceived usefulness toward iPads as language learning tools.
H9: iPad based tasks have positive predictive value for perceived satisfaction toward iPads as language learning tools.
H10: iPad based tasks have positive predictive value for perceived usefulness toward iPads as language learning tools.
H11: Perceived satisfaction has positive predictive value for learner motivation toward iPads as language learning tools.
H12: Perceived usefulness has positive predictive value for learner motivation toward iPads as language learning tools.
H13: Perceived satisfaction has positive predictive value for the effectiveness of iPads as learning tools.
H14: Perceived usefulness has positive predictive value for the effectiveness of iPads as learning tools.
H15: Learner motivation has positive predictive value for the effectiveness of iPads as learning tools.
Accepted hypothesis
The perceived self-efficacy has negative effect on the perceived satisfaction
The self-regulation has positive effect on the perceived satisfaction.
The interactive learning environment has positive effect on the perceived usefulness.
The interactive learning environment has no effect on the perceived satisfaction.
The iPad ease of use has negative effect on the perceived usefulness.
The iPad based tasks have positive effect on the perceived usefulness.
The iPad ease of use has no effect on the perceived satisfaction.
The iPad based tasks have negative effect on the perceived satisfaction.
The self-efficacy has positive effect on the perceived usefulness.
The self-regulation has negative effect on the perceived usefulness.
The iPad usefulness has positive effect on the motivation.
The perceived satisfaction has no effect on the motivation.
The perceived usefulness has negative effect on the learning effectiveness.
The perceived satisfaction has negative effect on the learning effectiveness.
The motivation has positive effect on the learning effectiveness.

Table 5.7: The tested and accepted hypothesis

The Table 5.7 illustrates the research hypothesis, the tested and the accepted ones. As it is shown in the table, the perceived self-efficacy, which refers to students' beliefs in their capacity to execute behaviours necessary to produce specific language performance, has negative effects on perceived satisfaction, which supposes the fulfilment of their expectations. On the other hand, the fulfilment of their expectations is encouraged by their self-regulation that is to say by their ability to monitor and control their own behaviour and learning habits through iPads. In other words, students are happy with the control they have over their learning through iPads as a means of learning. The perceived usefulness is the fundamental determinant of user acceptance. It is positively affected by the interactive learning environments, which is the pedagogical approach that incorporates virtual networking and communication by students. Interestingly, according to the survey results, neither the interactive learning environment nor the ease of iPad use have any effects whatsoever on students' satisfaction of the device being implemented in their education. Which is more, the iPad ease of use, which is the user friendly operational system has negative effect on the perceived usefulness. In other words, students do not see it as a useful learning tool because of its user friendliness. On the contrary, the iPad based tasks have positive effect on the perceived usefulness. This means students see the iPad as a useful learning tool because of the learning it is able to provide through online tasks. The self-regulation has positive effect on students' satisfaction and perceived tool usefulness. In other words, working with iPads raises students' satisfaction level, as well as their level of language achievement. Students feel positive studying paperless and do their best to achieve success. They are satisfied and positive about this method of learning because they can regulate their device to serve their individual learning needs and pace. Because students are able to manipulate the electronic applications and multitask, they are happy with what they learn and hence, accept iPads as a means of learning.

Interactive learning environment has positive effect on perceived usefulness. Moreover, self-efficacy has positive effect on perceived usefulness. This means, interactive learning environment, which supposes communication between students as well as students and the teacher, information sharing and gaining practices, as well as multivariate forms of interactive language learning makes students positive about the usefulness of iPads as a means of language learning. Besides the interactive learning environment, self-efficacy as well, which supposes students' beliefs in their ability to succeed in language learning, makes them value the

importance and usefulness of the device for their learning, since iPads play a major role in how students efficiently approach their goals, overcome challenges, solve problems and complete various language tasks.

Perceived usefulness has positive effect on motivation, which in its turn has positive effect on learning effectiveness. This looks like a chain reaction in a sense, that students' positive attitudes towards iPads as a means of language learning motivates them into learning the target language, which results in higher language achievement and effectiveness. The degree to which the students believe that using the paperless system would enhance their language performance and progress, perceived usefulness motivates them into accomplishing language tasks and overcoming language difficulties by the help of the paperless learning. Moreover, motivation and learning effectiveness result from the interaction of learning needs and positive outcomes that students have towards the accomplishment of language tasks. Therefore, it must be stated that according to the survey analysis, iPads stimulate students' desire and energy to keep continuously interested and committed to language learning tasks, assignments, projects and other language learning requirements and make efforts to attain the goals.

To conclude, self-regulation showed positive effect on students' satisfaction and perceived tool usefulness. Interactive learning environment and self-efficacy have positive effect on perceived usefulness. Perceived usefulness has positive effect on motivation, which in its turn has positive effect on learning effectiveness. These factors are interconnected and have positive effect on each other according to the survey questionnaire analysis.

Chapter Six
Results: Reflective Journals

6.1 Reflective journal analysis in phase one and two

The aim of the reflective journal data analysis was to identify the themes and patterns that were grounded in the data (Corbin and Strauss 2008) and gain insights from level one teachers' reflections through weekly journal entries. I used Grounded Theory and constant comparative method to analyse the data, as I aimed at generating a theory that was grounded in my data from the participant teachers who had experienced and reflected on the process. As Fraenkel and Wallen (2014) mention, "Grounded theories are not generated before a study begins, but are formed inductively from the data that are collected during the study itself" (p. 429). In other words, I started with the data I had gathered and developed generalizations after working with it.

The first step was reading the reflections from beginning to end many times trying to understand the mood, feelings and experiences the participants had. "The idea behind the first reading is to enter vicariously into the life of participants, feel what they are experiencing and listen to what they are telling us" (Corbin and Strauss 2008, p. 163).

With the second step I examined each section in depth and wrote memos, to which I assigned a number and labelled with concepts (Corbin and Strauss 2008). "Memos serve as reminders about what is meant by the terms being used and provide the building blocks for a certain amount of reflection" (Bryman 2008, p. 547). Memos helped me to form ideas and keep track of thinking about various matters. I had to change the code names many times as I rethought about messages and ideas written in each line.

I also inserted methodological notes between the memos to explain, differentiate and understand how they fitted together. As I read I noted concepts from my data and made signs in memos reflecting mental connection between me and the reflections. "Though this system of dialoguing with the data may seem tedious, and at times rambling, it is important to the analysis

because it stimulates the thinking process and directs the inquiry by suggesting further areas for data collection" (Corbin and Strauss 2008, p. 170).

After the open coding which was the process of breaking down, examining, comparing, conceptualizing, and categorizing the data (Corbin and Strauss 2008), I started to relate the concepts. As Corbin and Strauss (2008) mention, memos that show the relationship between two or more concepts are examples of axial coding. Finally, after the core concepts were identified from the coded data categories and subcategories through open and axial coding, I referred to selective coding. Corbin and Strauss (2008) explain that, "[Selective coding] is the process of selecting the core category, systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development" (p. 116). When selecting and relating categories in this final step, I came to understand that I had two core concepts which served as context of learning: language learning and motivation, which eventually became my selective codes. Those two selective codes were then inserted into the Activity Theory of using two methods in language teaching: iPad based and textbook based, and were analysed through multivariate angles of that framework (Figure 1 and Figure 2).

6.2 Activity Theory Framework for Reflective Journal Analysis

Though tools exist whenever people are involved in specific activities, they are also created through those activities. Therefore, a mediating action consists of a subject, an object and tools that are continuously transformed through the activity. This view of a mediated activity draws on a theory of learning that looks at language learners as subjects who actively construct meaning within the context. Although, learners or subjects are regarded as active, it is the responsibility of the facilitator to provide opportunities for acceptable construction (Barab, Evans and Baek 2004). In this study the facilitator is the method and subjects are language learners. The context of learning involves the two core concepts that emerged from the coded data categories, motivation and learning. They are to transform the object into an outcome.

In this study the Activity Theory of using two methods for language learning: iPad based and textbook based language learning, starts out from the idea that students start using the methods in the context of their participation in language learning activities. Language learning in

this view is a mode of activity that can be characterized by specifying the method that describes how the activity in general is accomplished. To describe this accomplishment, two conceptual models of activity theory have been formed based on two methods: iPad based and textbook based language learning (Figure 6.1 and Figure 6.2).

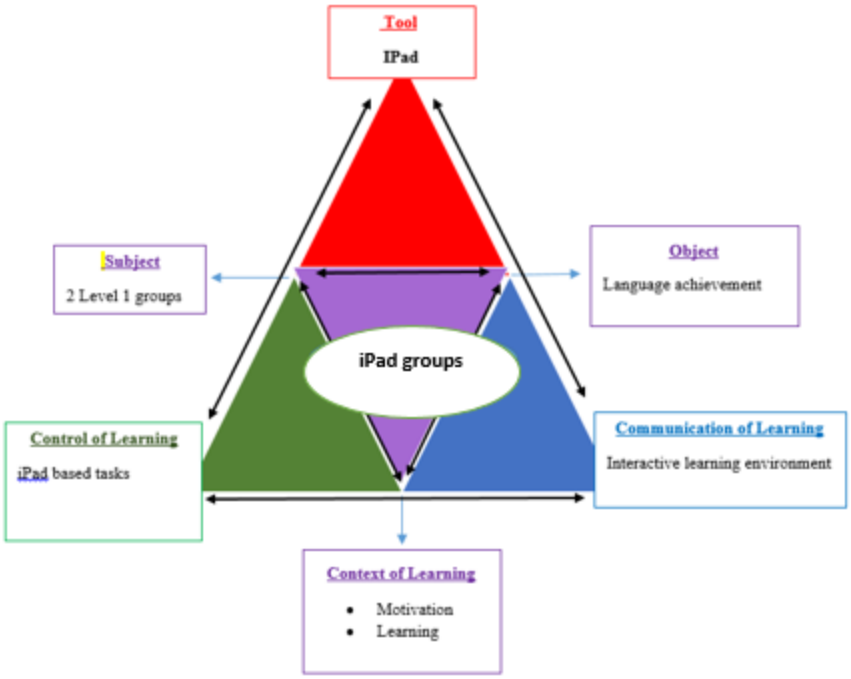


Figure 6.1: AT conceptual model of iPad based language learning

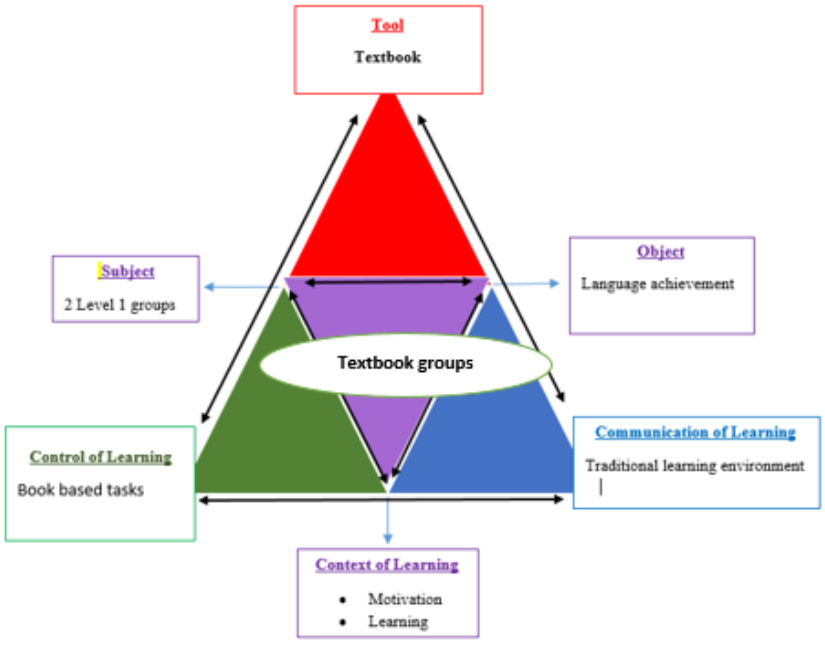


Figure 6.2: AT conceptual model of textbook based language learning

The models look at the activity as a purposeful, productive process carried out by subjects, who are 80 beginner level language learners placed in four homogeneous groups, on an object, which is language achievement, via two mediating tools: iPads and textbooks (Engestrom 1999). The subject, object and tool are observed within the context of a teaching-learning process, in which activity is embedded. In the Activity Theory triangle the control of learning is iPad based vs textbook based tasks, and the communication of learning is interactive vs traditional learning environment. In this section of reflective journal analysis of the study these six elements comprise and govern the activity system. This practical view of the activity with emphasis on the mediating tools makes the activity theory well suited for the analysis of process and activities involving significant components in higher education (Khanova 2012).

Findings

"An action is a discrete element of activity that fulfills an intermediate, conscious goal of activity" (Bedny and Harris 2009, p. 132). Hence, the actions leading to realize a task result in the achievement of the goal. Taking this into consideration the subcategories of the conceptual AT triangles illustrated in Figure 6.1 and Figure 6.2 will be presented in loops to discuss the reflective journals in depth and find out results of actions in relation to the goal.

6.3 Phase one: Reflective journals in two iPad groups

Two teachers teaching two different groups with 20 students in each, wrote four reflective journals throughout four weeks of their teaching with iPads. Subjects in these two iPad groups were beginner level language learners who used iPads as language learning tools for the first time and completed language tasks excusivly on them having no other mediating tools at hand.

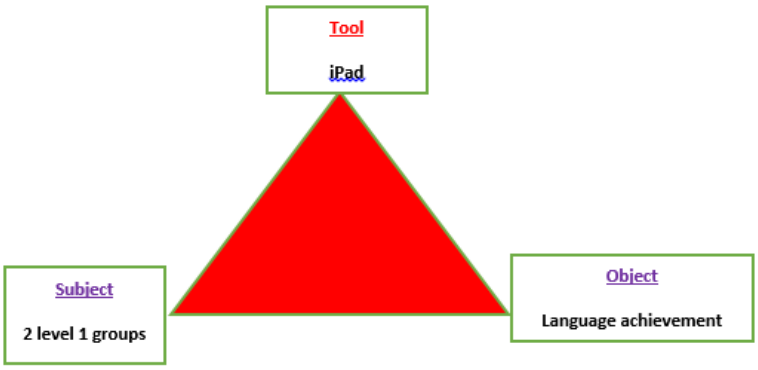


Figure 6.3: Tool, subject and object AT analysis

Figure 6.3 illustrates the AT analysis of the tool, subject and object interaction during phase one in iPad groups. It conseptualizes the ways that the tool influences the subjects to reach the object. To put it in words, the Teacher A's and Teacher B's reflections have many similarities about advantages and disadvantages of using iPads as a means of language learning. Both teachers wrote about technical glitches and variouse issues with operating iPads for the first class mainly. "Students had some issues with operating the programs and needed constant assistance", "Technical issues wasted almost one teaching period", "There were students who struggled to write or read on the tablet screen" (Teacher A). "Though we had couple of technical glitches with iPad apps and e-book codes, we successfully went through the first week", "They were not quite happy and willing to work on iPads", "Students got irritated when writing on the screen because the space for writing was too small" (Teacher B). As can be seen from the above mentioned journal entries, students expressed resistance to applying the new method for learning during the first week. However, there is no evidence of further complaints or resistance from the second week onwards in any of the teachers' reflections.

Besides technical glitches there were also positive effects of using iPads for language achievement. Both teachers mentioned that their students easily and quickly started using the technology. "I was impressed with the mini projects that pairs quickly and easily produced through the *iMovie*", "They easily and quickly completed all reading exercises", "Students got handy with the iPads and completed operations with ease", "They drew on their answers from previouse activities and quickly referred back to their e-notes from previous units", "This week students individually put their traditional food recipes on blogs, podcasts, and PhotoStories online" (Teacher A). "This week I noticed my students were growing up tech-savvy and

mastering their collaborative working skills", "They were easily searching for new information and figuring out how to use it for their advantage and to share with eachother" (Teacher B). These reflections indicate that iPads allow students to deal with course content easily and productively, which may not be possible with other educational tools. It promotes creativity and hands-on learning. It is obviouse that students can search for new vocabulary with a single click or refer to their previouse notes in seconds and not lose precious minutes of class time. Learners prefer receiving information quickly from multiple multimedia sources and to network simultaniousely with their peers. Teacher reflections on ease of iPad use show that it enables collaborative interaction between students emphasising its influence on the students' learning practice, and consequently on their language performance and achievement.

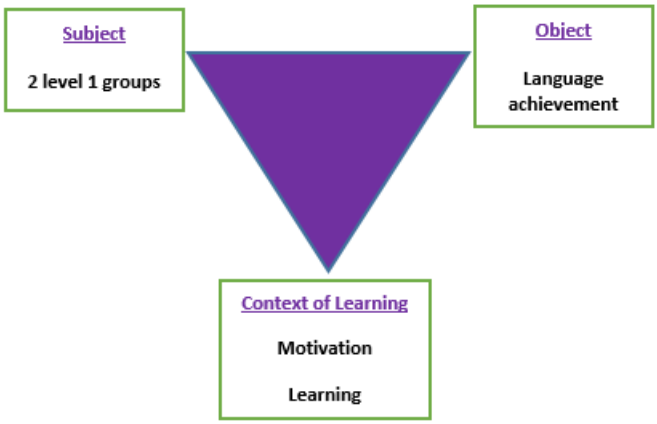


Figure 6.4: Subject, object and context of learning AT analysis

Figure 6.4 illustrates the interaction of subject, object and context of learning through AT analysis. The reflective journal coding revealed two core concepts: motivation and learning, which became the context of learning (Figure 6.4). Therefore this section discusses the interrelations of subjects' motivation and learning as contexts of learning towards language achievement goal.

Throughout the journal entries the teachers mentioned about language learning being promoted through student motivation which encouraged their language learning. "It was an intensive and fun learning week for my students", "Everybody seemed to be motivated and willing to try various interactive functions for their learning. For example, one of the students suddenly exclaimed 'Miss, it said well done to me" (Teacher A). "One of the tasks they enjoyed doing was the iMovie project which they did in pairs", "They liked working with the interactive

textbook", "Students did their best to come up with impressive in-class presentations", "They liked the expansion activity a lot on page 36", "The week went very well. Students worked with their iPads at all times and enjoyed conducting their studies on them" (Teacher B).

The positive teacher reports showed that iPads initiated, guided and maintained goal-oriented behaviours. Students realized that simply having the desire to accomplish the language tasks was not enough. Accomplishing those tasks required the ability and willingness to try and persist through technical obstacles and keep discovering and practicing in spite of anticipated and unanticipated iPad related challenges. A vivid example of this is Teacher A's reflection of the first week, where she writes, "Not only the unit vocabulary and grammar were mostly used accurately, the mood and motivation apparently took over the hard work." She continued then and concluded her reflection with the following words, "On this note I will say I have a strong feeling that students have made friends with iPads and found it challenging but rewarding to work with iPads to achieve their goal." Both teacher reflections indicate that students were self-determined and intrinsically motivated. Deci and Ryan (1985) define intrinsic motivation as, "motivation to engage in an activity because that activity is enjoyable and satisfying to do" (p. 39). According to these authors people seek challenges if they are given freedom to choose what activities to perform. Then they develop a sense of competence and internalize it into the self-concept (Figure 6.5).

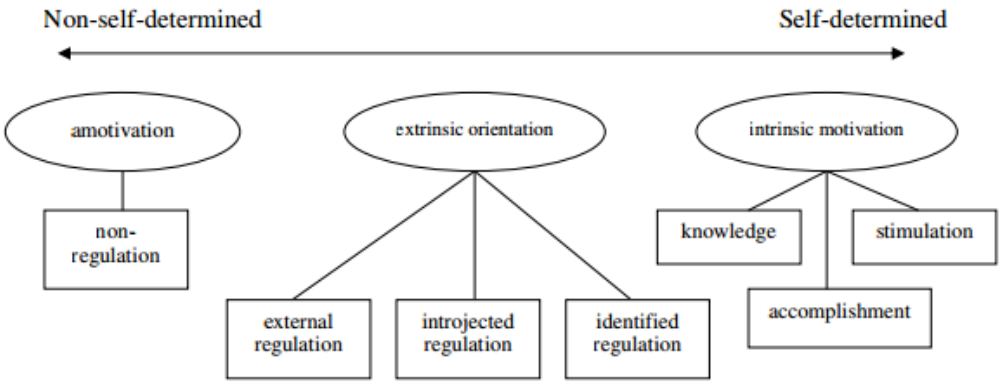


Figure 6.5: Orientation subtypes along the self-determination continuum (Deci & Ryan 1985)

Hence, it can be stated that iPad based activities not only were enjoyable and satisfying for students in both groups, but also opened ample opportunities for them to choose electronic

learning activities and tasks to accommodate their individual learning styles and needs. This, in its turn, developed a sense of competence in the students and motivated them intrinsically.

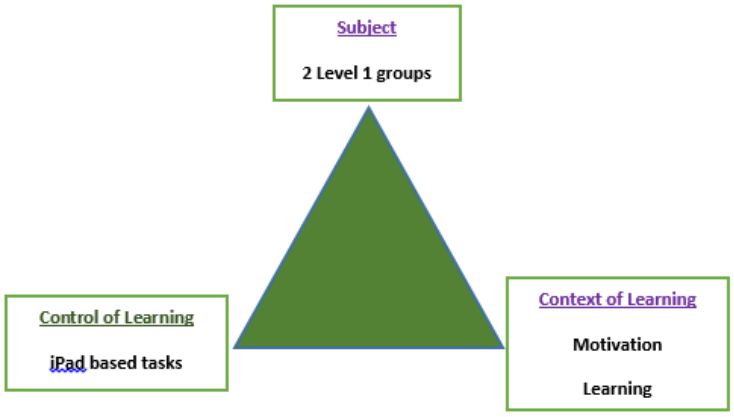


Figure 6.6: Subject, control of learning and context of learning AT analysis

Figure 6.6 illustrates the AT analysis of effects that iPad based tasks have on subjects' level of learning and motivation. The control of learning in two iPad based groups was using no other methods or tasks but iPad based ones. Language learning was conducted through electronic textbooks, electronic dictionaries, skill based electronic exercises which offered immediate help and feedback, various applications for designing and presenting projects, numerous applications for recording, searching, sketching, scanning and piloting, etc. Since the classrooms were equipped with video, audio and mirroring devices, it made iPad based tasks more meaningful and practical for language learning and practicing. Those classroom devices allowed students to project their screens, share information immediately with each other, make their voice recordings, projects, presentations and movies visible and audible for their peers and use the main classroom screen for interactive in-class communications, debates and discussions.

Reflective journals highlighted a firm connection between the iPad based tasks and the level of student motivation in language learning. It was expressed through students' self-efficacy, self-regulation, perceived tool satisfaction and tool usefulness to carry out interactive learning tasks in the interactive learning environment. Examples of student's self-efficacy, which supposes the level of student mastery of operating the device, were observed in both teachers' journals. "Most of my students were comfortable and confident in operating the apps", "They used all sorts of audio and visual effects which made this presentation assignment fun for them to create"

(Teacher A). “They found and created images with sentences and added audio and video pieces to illustrate the words and shared with their peers in seconds” (Teacher B).

Self-regulation, which supposes students’ level of independent interaction with the device, recorded a high jump in teachers’ reflections throughout the teaching and learning process. “Students not only completed all the grammar exercises in the e-books independently but also practiced this grammar and vocabulary through the Tense Buster and other apps that they downloaded during weeks one and two”, “When finished earlier than others, some students would try to operate new language apps, practice the language through different educational programs they found in the app-store and find new ways and answers to the questions they had” (Teacher A). “The student then insisted and suggested to explore the settings, options and consider doing a dry run with the peers to iron out the kinks”, “The highlight of the week was the new language app one of the students found and shared with all of us”, “It took some time, but we all followed her advice and the app turned out to be a valuable one for everyday vocabulary practice”, “I noticed that when making a mistake most of the students checked the feedback and redid those items several times until they were successful” (Teacher B).

Students’ newly developed skills and willingness to operate iPads for their language learning could not take them anywhere else but to satisfaction in their learning in terms of perceived tool satisfaction and usefulness. “The exercise enabled them to stop the audio at any point they wanted to, to take notes or listen again for correct pronunciation” (Teacher A). “I found that students felt more comfortable sharing their ideas and producing their work through iPads, and even the students who typically were shy or didn’t have many friends in class felt like they could fit in” (Teacher B). Not only were the students satisfied with their learning ways and procedures, but also the teachers. An example of teacher satisfaction was found in Teacher A’s reflection, “Overall, I was satisfied with my students’ progress this week, which I could follow daily through the digital grade book. It provided me with the immediate assessment of my students’ progress” and “Online resources helped to address issues right away enabling me to work with my students’ strengths and weaknesses and provide a more customized approach to overcome in-class unanticipated problems”.

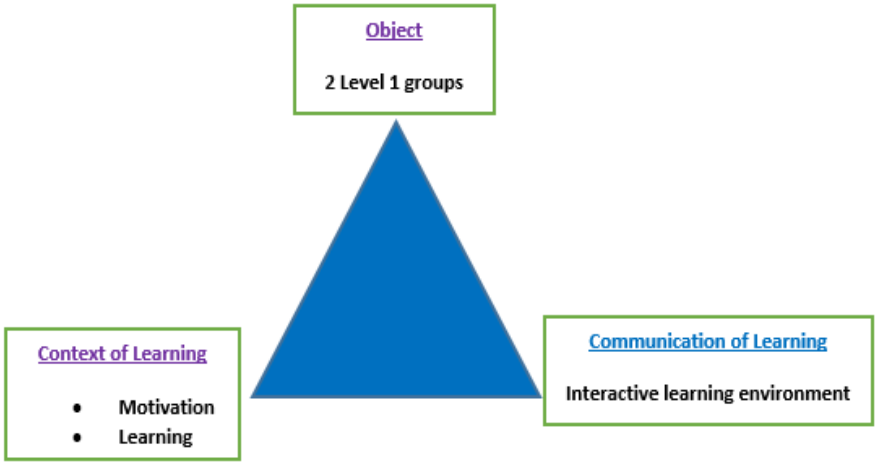


Figure 6.7: Object, context of learning and communication of learning AT analysis

Figure 6.7 explains the object, context of learning and communication of learning interrelations. Modern technological advances in education make it possible to develop interactive learning environments to create innovative ways of language learning. Most of the popular theories about interactive learning are reinforced by the constructivist view, which suggests that active learning environments are better suited for learning (Hrastinski 2009). It mentions that there is no certain meaning of the world to comprehend, rather, there are various ways to structure that world and make meaning of it. Therefore, it is better to develop an interactive learning environment for the learners to help to receive the language material in a way that naturally fits their individual ways of constructing knowledge.

By interactive learning environment in this study is meant iPad-based language learning environment that supports structured interaction between the students. Teachers' reflective journals not only talked positively in this regard but also connected it to learning effectiveness. "They did nice presentations. It was evident that they tried hard to produce the language by the help of technology and had fun creating, designing and learning", "I found interesting the way they collaborated in class by sharing their writings, answers and other useful information", "Their digital products were viewed by their peers who wrote comments and got involved with digital discussion" (Teacher A). "I was impressed with my students' initiative of finding and exploring various apps to practice grammar and share it with each other", "It was important for the students to understand that *do* is also used as a verb, usually related to the concept of work. So, they went ahead and found other grammar apps to practice this in class and shared those apps

with others to try and practice", "They worked in pairs to plan a tour of their college. They drew an interactive e-map and decided where the tour began and ended, and what places had to be on the tour" (Teacher B). These examples from teacher journals show the ways students benefited from interactive learning and how fruitful those interactive tasks were for their language acquisition, development and production.

While analyzing those reflective journals it is impossible not to notice multiple entries about interactive learning environments being a spark for student motivation. "Healthy classroom interaction, interactive materials and introduction of skills in the appropriate sequence, effective time management, as well as final presentation projects done perfectly well constituted evidence of success for this first week", "Instead, they worked in groups, shared the timed work, found suitable programs, pictures and videos, and produced the language through chunks and sentences. They actually cooperate with ease and excitement and came up with beautiful i-movie pieces" (Teacher A). "I felt that using iPad ins class made students more fascinated with their learning", "Judging from their active participation in class, one could say that there was evidence of constructive student-student, iPad-student, as well as teacher-student rapport", "On Thursday the groups prepared an e-weather forecast and reported to class with great motivation and success", "I was pleased to see how my students progressed in operating iPads for language learning and how enthusiastically they handled and completed all language tasks" (Teacher B).

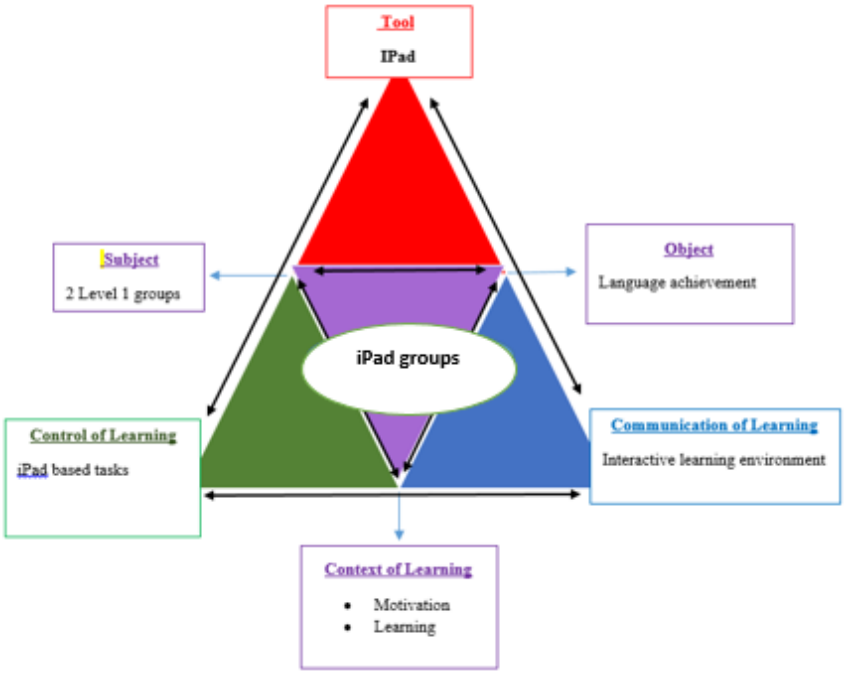


Figure 6.8: AT conceptual model of iPad based language learning

Now that all elements of activity theory have been looked at and discussed in loops for phase one iPad groups, it is necessary to mention that the activity, which was undertaken by subjects using the tool to achieve the object, transformed it into an outcome and demonstrated positive results regardless of technical and technological challenges (Figure 6.8). Based on a technological perspective of human-technology interaction, control may pass between learners and technology (Liaw and Huang 2014). When students use iPads, the value of iPads stems from the method through which learning is delivered, whether students are able to use iPads to easily access learning materials and whether they are able to control the learning speed and style of interaction with iPads. So, from an iPad perspective in language learning, control of language acquisition can be achieved based on learner characteristics such as self-efficacy and self-regulation, which, as teacher reflections in phase one of the experiment showed, can successfully result in motivation and active language learning (Figure 6.8).

6.4 Phase one: Reflective journals in two textbook groups

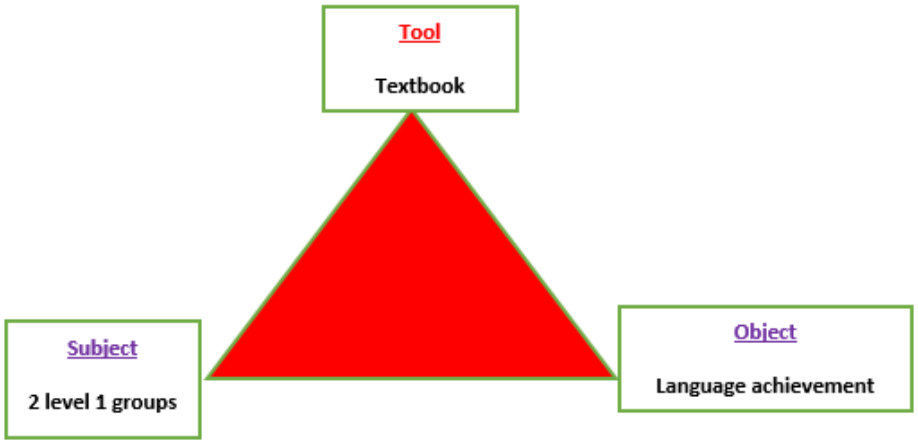


Figure 6.9: Tool, subject and object AT analysis

Figure 6.9 illustrates the AT analysis of the tool, subject and object interaction during phase one in textbook groups. It explains how the tool impacts the subjects to reach the object. Two teachers teaching two different groups of 20 students in each, wrote four reflective journals throughout four weeks of their teaching with textbooks. Subjects in these two iPad groups were beginner level language learners who used textbooks for language learning and completed language tasks excusivly on them having no technological tools at hand. Teacher C's and Teacher D's reflections, who taught these two groups, highlighted several advantages and disadvantages of using textbooks as a means of language learning.

The evidence from reflective journals mounted that paper books have important advantages as tools for language learning. One of the advantages mentioned in Teacher C's journal was the immersive interface of the book. "The non-distracting book interface helped students to keep on task and sucessfully complete reading and vocabulary exercises", "Due to its spatial layout students felt confident using the book and could easily access the information they needed." Teacher D talked positively about students' direct interaction with the book, "Students underlined and highlighted important grammatical points or vocabulary on their books and wrote up notes in the margins."

As good as they appear, textbooks do have some limitations. The teacher reflections highlighted the concept that the textbook must be used judiciously. That is to say, a productive class with textbooks needs many tools in its construction. Since, there were no electronic tools

but pen and paper materials used in class, the teachers had to spend a lot of time creating and adapting extra materials for better learning and language achievement. “I had to create extra materials and adapt exercises, print, cut and prepare them for group or pair work” (Teacher C). “The book activities were not enough to practice and understand *Present of be* and I brought in supplementary materials every day”, “Extra communicative activities brought in some variety and kept away from sticking to the textbook which drove the classroom atmosphere to a final fadeout” (Teacher D).

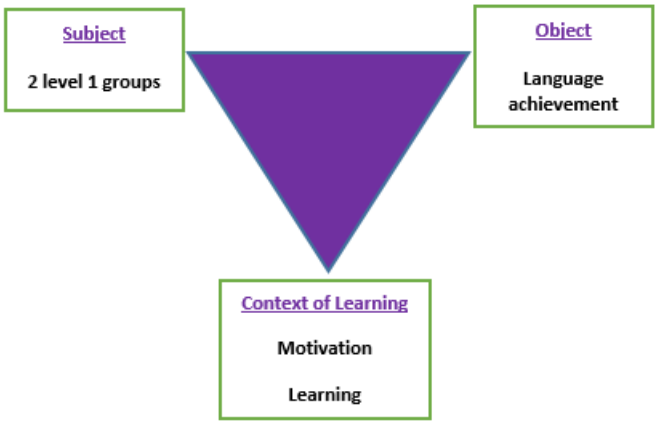


Figure 6.10: Subject, object and context of learning AT analysis

Figure 6.10 illustrates the interaction of subject, object and context of learning through AT analysis. The reflective journal coding revealed two core concepts: motivation and learning, which became the context of learning (Figure 6.10). Therefore this section discusses the interrelations of subjects’ motivation and learning as contexts of learning towards the language achievement goal in textbook groups.

Motivation and Learning as the main elements of Context of Learning in this Activity Theory triangle were looked at from the scope of students’ language achievement when exposed to textbooks. According to Deci and Ryan’s (1985), orientation subtypes along the self-determination continuum, the experimental group students’ motivation and learning will be placed under the extrinsic line (Figure 3). Both teachers’ reflective journals speak about external factors hindering students’ intrinsic motivation, such as constant dependence on the teacher for individual feedback, verbal communication and information sharing, no choice and variety of materials for skills and language development. “I felt classes were dull for the students as they complained about not having interesting exercises in the book”, “… some students needed

constant reassurance that what they did was correct and that they were going in the right direction. So they needed immediate teacher feedback to keep them moving all the time. I guess this will be an issue for coming weeks too", "I was kept on my toes by 20 students who sought individual feedback on vocabulary and grammar as they finished their exercises" (Teacher C). "This week I became aware of my students' strong and weak points and was needed every single minute to give verbal and written feedback to individual students as well as to groups of them", "I noticed students piling up at my desk after classes (especially the struggling students who hardly participate in class) at break times and waiting for me to look at their work and give extra help", "I was constantly needed for face-to-face feedback almost after every exercise, but I was equally able to work with individual students without losing sight of entire class" (Teacher D).

Deci and Ryan (1985) define extrinsic motivation as, "actions carried out to achieve some instrumental end. This type of motivation drives the learner to persist learning as long as the external incentive is present." (p.39). An external incentive in this case was the presence of the teacher and the book to be completed through guided learning.

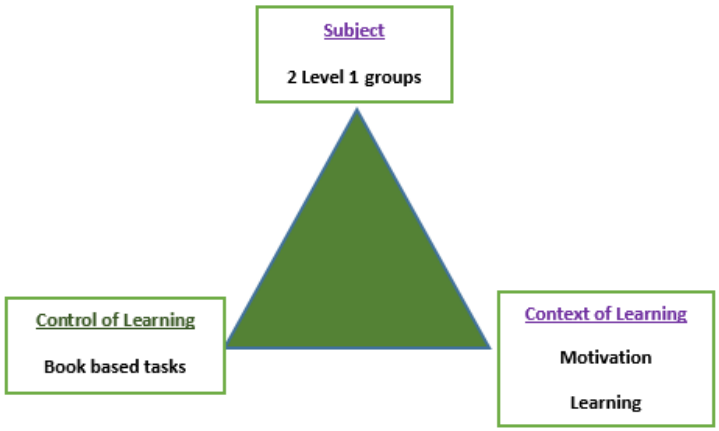


Figure 6.11: Subject, control of learning and context of learning AT analysis

Figure 6.11 illustrates the AT analysis of effects that iPad based tasks have on subjects' level of learning and motivation. The control of learning in two textbook based groups was using no other methods or tasks but book and paper based ones. Language learning was conducted through textbooks, dictionaries, printouts, worksheets and teacher made supplementary materials.

Reflective journals emphasized a connection between the book based tasks and the low level of student motivation in language learning. It was explained through time constraints and level of book difficulty. “I tried to make textbook exercises more interesting for them by creating competitions and games, which took lots of effort and time”, “The units were long and students hardly managed to complete them on both books”, “This week I didn’t have to supplement a lot, but a couple of activities to practice the present simple tense. This was due to the lack of class time for extra activities since the units were tense and completing written tasks took students long to finish”, “It still took me a lot of time to create extra materials that could provide my students with suitable situations and encourage them to ultimately use the rules in real-life communication” (Teacher C). “Grammar and writing took most of the class time.” “It required a considerable amount of guided student time inside the classroom to enable understanding and retention of unit content”, “The time issue was still a big concern. Though I had prepared extra help for students, no extra activities were given time to” (Teacher D).

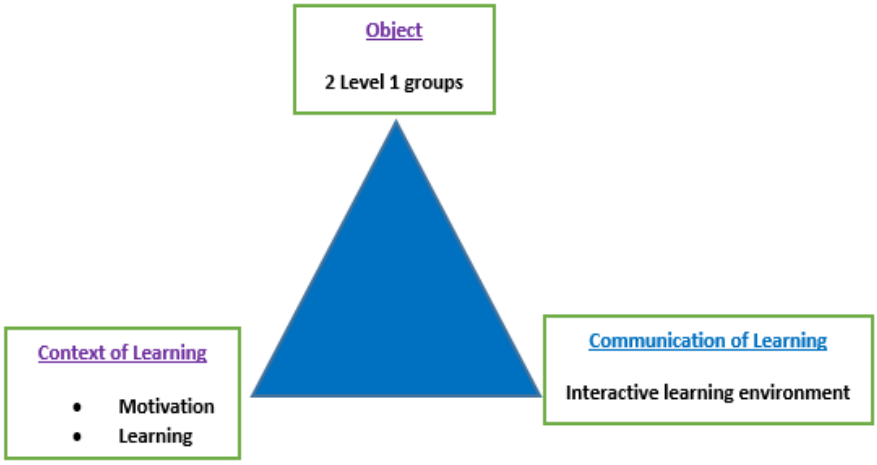


Figure 6.12: Object, context of learning and communication of learning AT analysis

Figure 6.12 explains the object, context of learning and communication of learning interrelations in phase one textbook groups. Though level of student motivation and learning was caught up by time restraints and relatively dense units, it was encouraged by interactive tasks and projects teachers created parallel to the textbook units. “The end of the week project created a big enthusiasm in the group”, “When I asked them why they were so happy and enthusiastic about the task they simply reasoned that it was different from the book”, “Thursday’s presentation project was the highlight of the week. They not only prepared speech and posters

about traditional meals but also had prepared and brought to class several small traditional dishes to use as visuals in their presentations and shared it with others after class", "I felt the last day of the week was the most interesting for the students because they had to work on a mini project (Teacher C). "They had fun and tried their best to express themselves to introduce their friends through the project they did in pairs", "My students enjoyed working in groups and pairs. They cheered up when having group competitions and interactive tasks and kept asking for more", "The presentation project was a success and cheered up the class. I think voting for the best presentations was a successful strategy of motivation since most students were able to formulate an evaluation of the presented work. Overall, this week was remarkably successful and enjoyable for my students" (Teacher D).

Judging from teacher reflections, it becomes clear that increasing student engagement in class through various communicative and interactive assignments is a way to motivate students in learning. The students' motivation and active participation in class is probably the strongest element here with the creative and effective use of textbook ranking next.

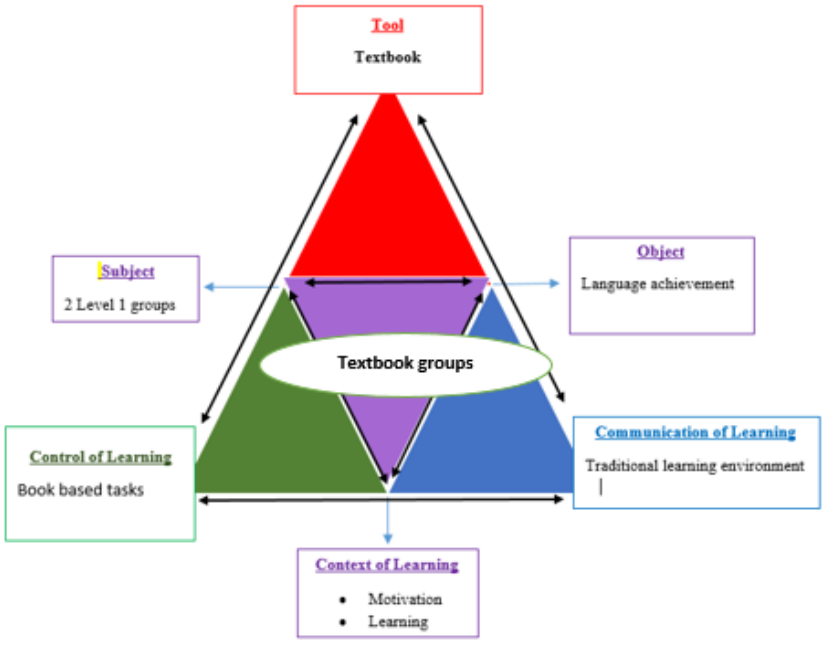


Figure 6.13: AT conceptual model of textbook based language learning

Now that all the elements of activity theory have been looked at and discussed in loops for phase one textbook groups, it is necessary to mention that the activity, which was undertaken by subjects using the tool to achieve the object, transformed it into an outcome and demonstrated positive results regardless of the above mentioned book related challenges (Figure 6.13). So, books can be qualified as valuable tools for language learning if supplemented and used creatively.

6.5 Phase two: Reflective journals in two iPad groups

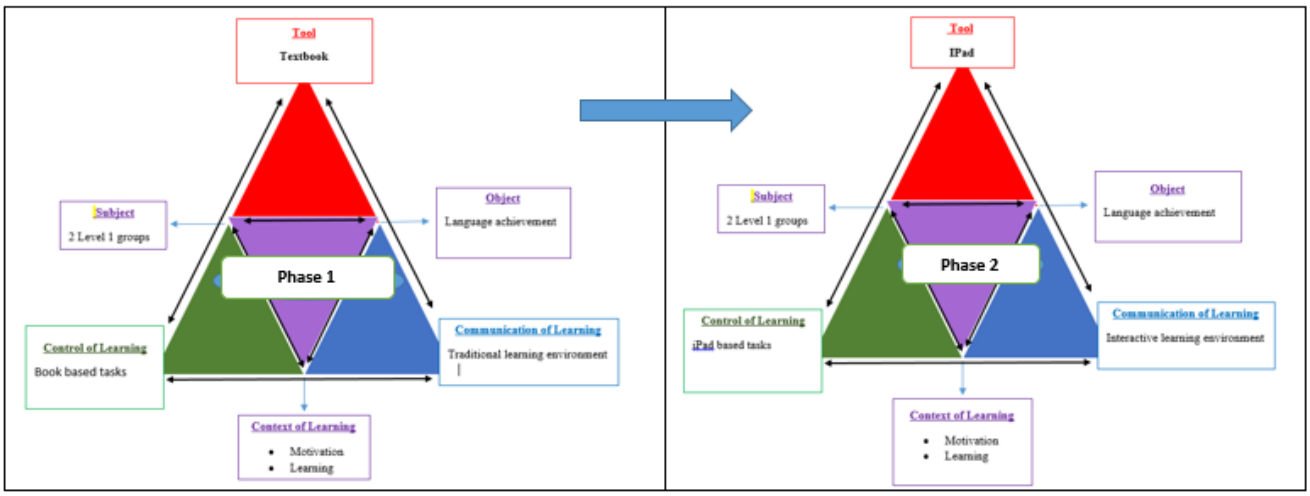


Figure 6.14: Comparison of phase one textbook group model with phase two iPad group model

Figure 6.14 illustrates a conceptual model of AT based explanation of two phases that two groups went through. The two groups, which were exposed to the textbook method in phase one, received iPads and commenced their studies with iPads in phase two. Therefore, the control of learning in those two groups was using no other methods or tasks but iPad based ones. Language learning was conducted through electronic textbooks, electronic dictionaries, skill based electronic exercises which offered immediate help and feedback, various applications for designing and presenting projects, numerous applications for recording, searching, sketching, scanning and piloting, etc. Since the classrooms were equipped with video, audio and mirroring devices, it made iPad based tasks more meaningful and practical for language learning and practicing. Those classroom devices allowed students to project their screens, share information immediately with each other, make their voice recordings, projects, presentations and movies

visible and audible for their peers and use the main classroom screen for interactive in-class communications, debates and discussions.

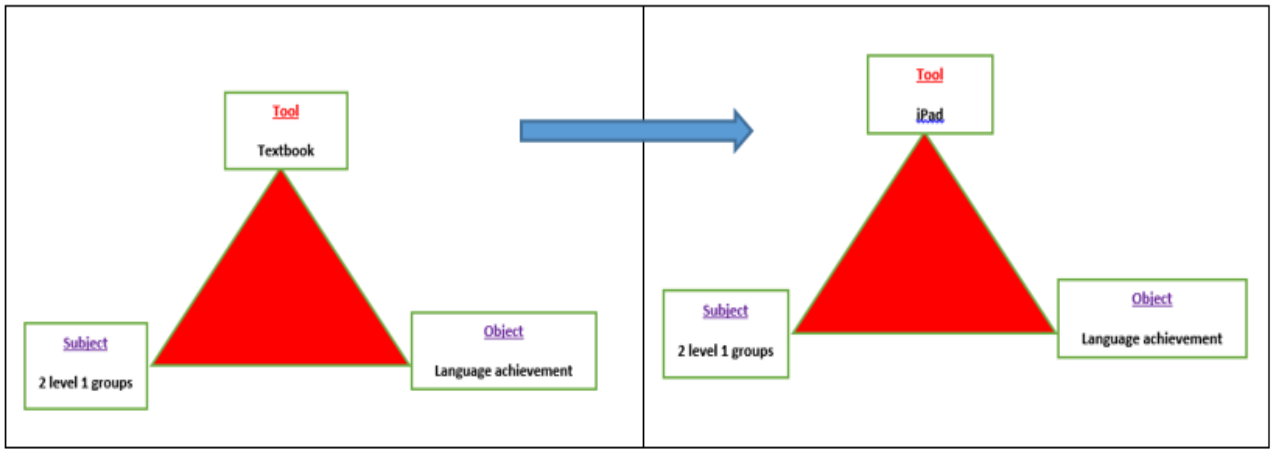


Figure 6.15: Comparative AT analysis of the tool, subject and object in two phases

Figure 6.15 illustrates the AT analysis of the tool, subject and object interaction during phase one and phase two of the two groups that moved to paperless learning with iPads in phase two after being exposed to paper textbooks in phase one. Like phase one iPad groups, phase two iPad groups experienced technical challenges for the first part of the week too. Teacher C and Teacher D recorded technical issues related to installations and program set-ups. "Sunday's classes were spent on installing the needed apps and e-textbooks, as well as solving technical glitches with set-ups and e-mail accounts", "Students were very slow in operating their tablets because it was a new experience for them", "It was a transition for this class from paper based to iPad based learning, therefore, some of the students took longer to adjust" (Teacher C). "My students were happy to be given a chance to study with iPads. Though they had to set up the iPads, update the programs, create apple ID and password, open e-mails, download college apps and e-books, they did their best to cooperate and patiently wait for their turn", "There were also negative reactions this week. A student was really upset when she accidentally deleted her work that she had spent considerable time creating. I tried to recover it but was not successful", "Another problem was related to iPad apps and two students didn't have credit cards to purchase those apps and had to use the free ones which didn't have all the functions. They weren't happy

about that", "The first two days we spent on adjusting technical hiccups, but we eventually managed to create a positive atmosphere and commenced with teaching - learning" (Teacher D).

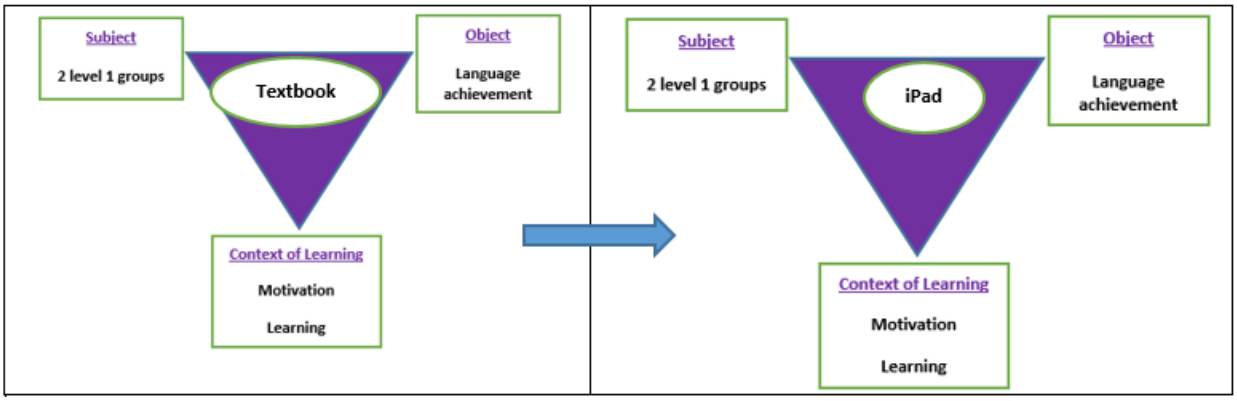


Figure 6.16: Comparative AT analysis of the subject, object and context of learning in two phases

Figure 6.16 illustrates the comparison of subject, object and context of learning in the same groups in two phases. That is to say, it looks at similarities and differences of the methods the two groups were motivated in language achievement in two phases. While students in both groups showed extrinsic motivation when exposed to textbooks, they became intrinsically motivated in phase two while learning with iPads (Figure 6.17).

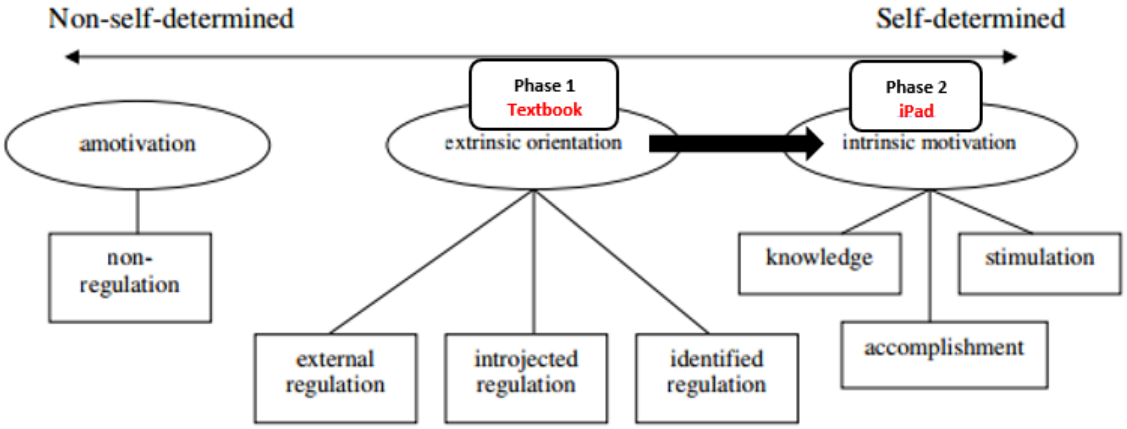


Figure 6.17: Orientation subtypes along the self-determination continuum (Deci & Ryan 1985)

Examples of this transition were reflected through both teachers' journals throughout the experiment. "I observed enthusiasm and motivation in class which I think was connected with new tablets and innovation", "Students were keen on using their iPads for creating, completing

and presenting the assigned activities. They loved the idea of experimenting, competing and sharing with peers", "Students were eager to embrace iPads and were able to troubleshoot technical issues and resolve them as quickly as possible" (Teacher C). "I felt through the use of iPads students became more fascinated with their learning compared to the phase when they used paper" (Teacher D).

While in phase one students' constant dependence on the teacher for individual feedback, verbal communication and information sharing, limited choice and variety of materials for skills hindered language development and drew students to extrinsic motivation, in phase one iPads opened up ample opportunities for learners to receive immediate electronic feedback as soon as they finished their task, gave wide variety of apps and programs to choose from to develop their language individually with minimal teacher help and share information immediately online without waiting for a common time and attention from the teacher's side. This is the reason why students got intrinsically motivated to engage in iPad based language learning activities because they were enjoyable and satisfying to do (Deci and Ryan 1985). According to Deci and Ryan (1985), people seek challenges if they are given freedom to choose what activities to perform. Then they develop a sense of competence and internalize it into the self-concept (Figure 6.17).

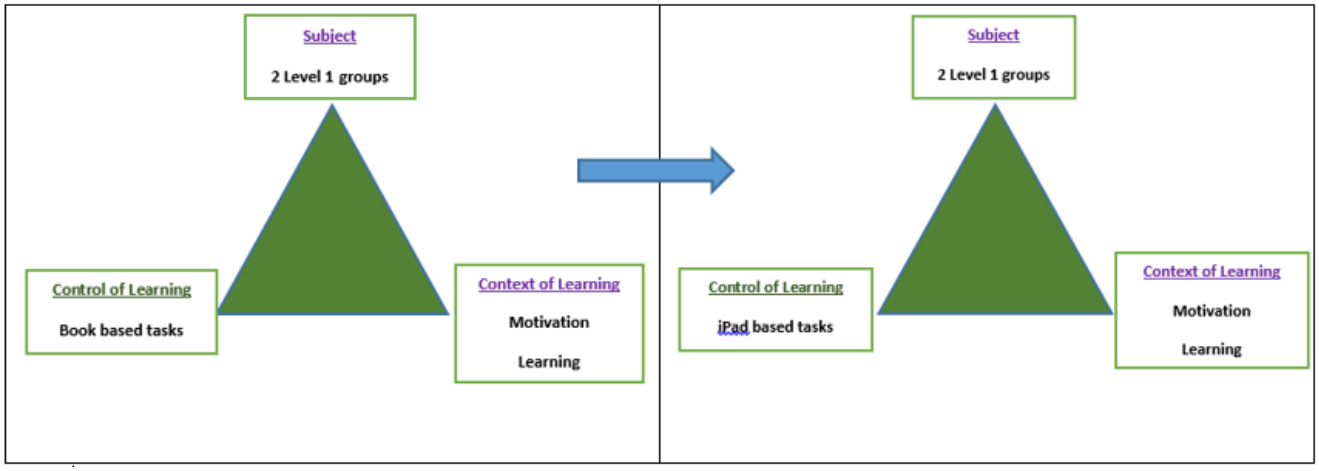


Figure 6.18: Comparative AT analysis of the subject, control of learning and context of context of learning in two phases

Figure 6.18 illustrates the comparative AT based model of the subject, control of learning and context of learning in two groups during two phases. While in phase one reflective journals emphasized a connection between the book based tasks and a low level of student motivation in language learning, they highlighted higher level of motivation in phase two. Time constraints and the level of book difficulty were not problems to be concerned with while using iPads, since quick e-book task completions, the variety of online extra activities and immediate electronic help and feedback were all there for students to experience and benefit. "We used a variety of digital materials, including: the e-textbooks, annotation apps, *Bblearn*, audio player and recording apps, as well as online educational short videos which were used to reinforce the learning acquired through previous activities and harmonize with the lesson objectives", "They didn't have to call me for feedback that often because they immediately received that feedback from their e-book and used the time purposefully to redo the exercises in case of mistakes", "Throughout the week my students took advantage of vast opportunities that were available to them as learners which naturally made their learning into fun" (Teacher C). "We took on this challenging week together and my students were able to show me the other side of their learning through their active participation. I have a feeling it's going to be fun learning for this group. I look forward to observing the journey unfold from this first week", "So, they practiced writing a paragraph about their favourite room and added pictures and labels where necessary. Then through mirroring students shared their paragraphs with others and voted for the best", "There is no doubt that iPad based delivery in particular and interactive learning in general, brought the language achievement and motivation of this group to a whole new level" (Teacher D).

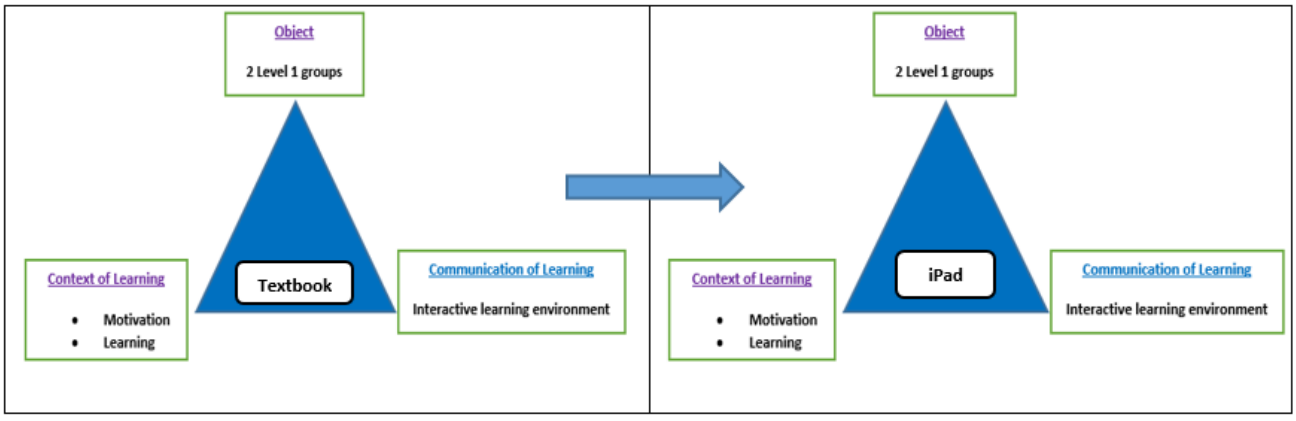


Figure 6.19: Comparative AT analysis of the object, context of learning and communication of learning in two phases

Figure 6.19 illustrates comparative AT analysis of the object, context of learning and communication of learning in two groups during two phases. In the loop of interactive learning environment both phases showed quite a high level of student motivation and language achievement. “They created a social reading experience through *Bblearn* group discussion board, which allowed them to connect with students reading the same text, ask questions, make comments, read their peers’ comments, express opinions and provide an interactive experience”, “With the help of e-book exercises and support apps students seemed to understand better and practice the new grammar”, “I felt the use of iPads in language class has greatly encouraged confidence and risk taking among my students” (Teacher C). “After completing several activities with *Tense-Buster* app students mastered this grammar and successfully used it in writing sentences and making notes in the charts given on page 74”, “Judging from their active participation in class, one could say that there was evidence of constructive student-student, iPad-student, as well as teacher-student rapport”, “… it resulted in instant feedback, variety of ways to accommodate different learning styles, developing cooperative, communicative skills and self-confidence when given a chance to redo the same task many times until they are successful and be praised for it”, “Never before has it been so easy and enjoyable to put together and share content with each other” (Teacher D).

The activity of learning through textbooks as compared to the activity of learning through iPads, which was undertaken by the same subjects throughout two phases to achieve the same object, transformed it into an outcome in both phases and demonstrated positive results regardless of textbook related or technological challenges. The 24 reflective journals showed that iPad based learning carries more benefits than textbook based learning in terms of motivation and learning effectiveness, which is illustrated in Table 6.1. The table summarizes the positive and negative teacher reflections of each method registered in reflective journals throughout the two phases of the experiment.

Summary of positive and negative teacher reflections from two experimental phases (Appendix D and Appendix E)		
	Positive reflections	**Negative reflections**
iPad based classes	• Learning became alive for the students while they were creating something that was new and meaningful to them. • One of the tasks they enjoyed doing was the iMovie project which they did in pairs. • They liked working with the interactive textbook. • To practice this grammar aspect we downloaded Tense Buster app and successfully practiced it through various interactive exercises. • I was impressed with the mini projects that the pairs quickly and easily produced through the iMovie. Not only the unit vocabulary and grammar were mostly used accurately, the mood and motivation apparently took over the hard work. • On this note I will say I had a strong feeling that students made friends with iPads and found it easy to work with them to achieve their goals. • The interactive exercises allowed students to redo the difficult parts and get immediate auto feedback. • Comprehension checks were done through collaborative tasks; asking and answering questions and sharing students' voice recordings with the teacher. • I felt my students enjoyed their learning this week and were on task at all times. • Every time I saw students had problems understanding a language aspect (ex. subject – verb agreement), I created activities from online resources on spot. • So, they went ahead (took the initiative) and found other grammar apps to practice this in class and shared those apps with others to try and practice. • Students worked with such motivation and speed that on the third day of the week there were no unit exercises left blank. • I was impressed with students' initiative of finding and exploring various apps to practice grammar and share with each other. • For example, one of the students suddenly exclaimed "Miss, it said well done to me." Apparently she had answered all questions correctly and got a positive reinforcement from the program. • They used all sorts of audio and visual effects which made this presentation assignment fun for them to create.	• Students had some issues with operating the programs and needed assistance. • Though we had couple of technical glitches with iPad apps and e-book codes, we successfully went through this first week. • I had two students constantly asking for permission to write on a paper. They explained that they got irritated when writing on the screen and that the space for writing was too small. • Though they were not quite happy and willing to work on iPads, they tried to do their best. • In the beginning, for some of us it [a new app] was difficult to operate and we wanted to give up. A student then insisted and suggested to explore the settings and options and to consider doing a dry run with the peers to iron out the kinks. • It was a transition for this class from paper based to iPad based learning. Therefore, some of the students took quite long to adjust. • There were also negative reactions this week: a student was really upset when she accidentally deleted her work that she spend considerable time on. I tried to bring it back but was not successful. • Another case was with the paid apps. Some students didn't have credit cards to purchase those apps we needed in class and had to use the free ones which didn't have all the necessary functions. They were not happy about this. They will try to get those apps next week, but we had to go through this experience.

	• It was a very intensive and fun learning week. Students got handy with the iPads and completed operations with ease. • Everybody seemed to be motivated and willing to try various interactive functions for their learning. • We never ran out of time or had time management issues, as digital files streamlined simple tasks such as distributing, collecting, on-spot marking, etc. • They collaborated in class by sharing their writings, answers and other useful information online. • …. even the students who typically were shy or didn't have many friends in class felt like they could fit in. • . I observed enthusiasm and motivation in class which I think was connected with new tablets and innovation. They were as if competing among themselves who could finish first and get the green auto ticks which would mean they made no mistakes. • Judging from their active participation in class, one could say that there was evidence of a constructive student-student, iPad-student, as well as teacher-student rapport. • There is no doubt that the interactive learning in general and iPad based delivery in particular, brought the language achievement and motivation of this group to a whole new level. • It overcame the "absent and late student" problems and created stronger partnership between home and college because of the transparency and easy access to assigned and submitted tasks. • Throughout the week my students took advantage of the vast opportunities that were available to them as language learners. Students not only learned and practiced the language but also developed such skills as critical thinking, problem solving, analytical reasoning, sharing and cooperating.	
	• Students effectively completed all reading activities in groups or pairs. • The group successfully worked with the book exercises and completed all of them individually, in pairs and in groups. • We conducted discussions about the school day length and time for homework and fun. Students were quite active in expressing their opinions and volunteering to contribute to the discussion. • They had fun and tried their best to express themselves to introduce their friends through the project they did in pairs.	• The book activities were not enough to practice and understand Present of be and I brought in extra materials every day. • They easily got tired of the textbook but had fun with the new listening exercises and discussions. • I felt classes were long and boring for the students and they complained about not having interesting exercises in the book. • I tried to make the textbook more interesting for them by creating competitions and games,

book based classes	• They used their notes and vocabulary logs to express opinion and bring reasons for their answers. • They enjoyed working in pairs and planning a tour of their college. They drew a map and decided where the tour began and ended, and what places had to be on the tour. • Vocabulary building was discussed this time through the dictionary entries. They enjoyed looking through thick dictionaries and searching for words. • Before writing the paragraphs they learned how to write idea maps and use them for writing. They actually did it very well. • In the end I asked my students to say what they thought about their friends' poster presentations and voted for the best one. It was a nice experience. • The differentiated instruction and a friendly class atmosphere kept students engaged and on task. • Poster Presentation was of a success and cheered up the class. I think voting for the best presentations was a successful strategy of motivation since most students were able to formulate an evaluation of the presented work.	which took lots of effort and time to think and constantly come up with something. • Another drawback was the grammar issue with do and does. I had to create extra materials and adapt exercises, print, cut, and prepare them for group or pair work. I wouldn't go through this if students had interactive e-textbooks of course. • When I asked them why they were so happy and enthusiastic about the project they simply reasoned that it was different from the book. • The units were long and the students hardly managed to complete all tasks and exercises from both books. • Grammar took little bit longer than expected because each and every student needed feedback on any written piece produced. • … the biggest concern of the week for me was the lack of time. • This week I didn't have to supplement a lot, but a couple of activities to practice the present simple tense. This was due to the lack of class time for extra activities since the units were tense and completing written tasks and activities took students long to finish. • Another reason for running out of time was that, some students needed constant reassurance that what they did was correct and that they were going in the right direction, so they needed immediate teacher feedback to keep them moving all the time. I guess, this will be an issue for the coming weeks too. • This week I noticed students piling up at my desk after classes (especially the struggling students who hardly participate in class) at break times and wanting me to look at their work or give extra help. • Though I had prepared extra grammar activities for them, we didn't manage to get to those activities because of time constrains. • I was kept on my toes by 20 students who sought individual feedback on vocabulary and grammar as they finished completing their exercises. • In large classes like this, students hesitate to come forward to ask questions and they need you to approach them individually and spend some time explaining and clarifying their doubts about specific tasks and language points. I noticed some students were too shy to express themselves in class and didn't want others to see their work.

Table 6.1: Summary of positive and negative teacher reflections from two experimental phases

As Table 6.1 illustrates in the section of the positive reflections about iPad use, the language achievement is easier, faster and more enjoyable when iPads are used as a means of learning. The level one language learners experienced the digital world for learning the target language that was completely out of sync with traditional approaches and assumptions about teaching, learning, giving feedback or assessing. Despite the best of intentions to teach the language through traditional methods, the textbook based teaching and learning did not really connect with modern language learners primarily because the traditional methods were targeted at learners from another age. As reflected in the journals, the students wanted their learning to be relevant, fast, applicable and instantly useful. Which is more, they wanted to know the possible relevance that learning specific language aspects have for them and their world and why it could not be fun most of the time. "While some experts may argue that the experiences the digital generation have are worthless and that play and games are simply preparation for work and life after school, for today's digital generation, play is work, and work is increasingly seen in terms of games and game play" (Jukes, McCain and Crockett 2010, p. 41).

Another interesting point raised in the journals was the constant complain of the textbook group students about not receiving immediate feedback to the completed work and teachers not being able to give enough of the class time to give individual feedback to students after every language task. The clue here is that the digital world presents the students with a direct tie between the effort taken and the reward received, whereas, the feedback or the reward given by the teachers in the traditional classroom during the experiment was either too nebulous or too slow to motivate students to keep the pace of progressive learning. It must be mentioned that unlike the textbook groups, iPad groups had no issues connected with the pace of receiving feedback or waiting for their work to be checked. As Jukes, McCain and Crockett (2010) mention, "A direct connection between effort and reward, immediate or deferred, is why digital culture resonates so strongly with the digital generation. In terms of immediate rewards, digital culture provides them with exactly what they not only want, but what they need most _ positive feedback" (p. 40).

To sum up, the critical point here was that students had an array of tools, options and services at their hands that gave them easy access to information they needed to achieve learning. The students in this study proved themselves digitally wise, which as Prensky (2012) defines is

the ability to find practical, creative, contextually appropriate, and emotionally satisfying solutions to accomplish tasks. “Those with digital wisdom look for the cases where technology enhances thinking and understanding … and make careful judgments about what digital enhancements are appropriate and when … they investigate and evaluate the positive as well as negatives of new digital tools and figure out how to strike the balance that turns tools into wisdom enhancers” (Thomas 2011, p.131).

Chapter Seven

Discussion

The experimental results revealed that level one language learners progress in learning English better when using iPads as compared to using textbooks. That is to say, according to the experimental results of this study, the paperless classroom is better suited for language learning purposes.

When the iPad is used in language learning, it is not seen as the object of learning the language but as a device to realize the language acquisition process. Thus, based on the technological outlook of the Activity Theory, individual functioning is considered to be distributed across and situated within the transaction of the contexts of the subject, available tools, and community with the division of labour (Uden 2007 in Liaw and Huang 2014). Since this study aimed to conduct an Activity Theory based enquiry into iPad implementation for language learning, it conceptualized a research model to provide insights into the use of iPads in an educational setting. The subjects who were level one students in this study, implemented the tools, which were the books vs iPads to perform cognitive functions to act on the object, which was the language achievement.

Phase one and phase two post-test analysis showed that both groups recorded higher language achievement results in phase two when exposed to the tool, which in the Activity Theory model was the iPad based language learning. The completed statistical analysis for the experimental phase one and two revealed that all four groups showed language achievement and positive results in the Activity Theory context of learning. However, the two iPad groups in phase one, which used iPads for their learning, showed higher post-test and progress test results as compared to the textbook groups, which used paper books for language learning. It is also important to mention that the textbook groups, which lagged behind in phase one, showed considerably higher results in phase two when the tool was changed and the contexts became activity systems" (Engestrom 1993 in Esch and John 2004), p. 56). According to the Activity Theory, the improvement occurred because of the individual actions which took place in relation to three factors: the available tools, the community and the labour distribution in that community.

Hence, according to the statistical analysis and the Activity Theory framework, iPad based learning appears to result in higher language progression.

The experimental results are well supported by the results of the survey analysis. The survey questionnaire, which was administered to all four groups, showed a positive relationship between students' attitudes toward iPad implementation as a means of language learning and their language achievement. The survey data analysis showed that self-regulation has a positive effect on language learners' satisfaction and their perceived tool usefulness, which means that working with iPads raises learners' satisfaction level, as well as their level of language progression. Moreover, the interactive learning environment has a positive effect on the perceived usefulness of the iPad based learning. Self-efficacy in its turn has a positive effect on the usefulness. This means, interactive learning environment, which supposes communication between students and the teacher, information sharing and gaining practices, as well as multivariate forms of interactive language learning makes students positive about the usefulness of iPads as a means of language learning. Perceived usefulness has a positive effect on motivation and motivation in its turn has a positive effect on learning effectiveness. To sum up, students' positive attitudes towards iPads as a means of language learning motivate them to learn the target language, which results in higher language achievement and effectiveness.

Not only the experimental and survey results showed that iPad based language learning is more productive than textbook based language learning, but also the reflective journal analysis. The reflective journals that four teachers involved in the experiment completed throughout two phases, revealed that the interactive learning environment in both phases showed quite a high level of student motivation and language achievement.

The activity of learning through textbooks as compared to the activity of learning through iPads, which was undertaken by the same subjects using two different tools during two different phases to achieve the same object, transformed it into an outcome in both phases and demonstrated positive results regardless of whether it was textbook related or technological challenges. However, as 24 reflective journals showed, iPad based learning carried more benefits than textbook based learning in terms of motivation and learning effectiveness. So, the language achievement is easier, faster and more enjoyable when iPads are used as a means of language learning. However, this is not to say that the skills and knowledge traditionally used or taught in the twentieth century are obsolete today. Much educational practice developed and used in the

20th century are effective nowadays and some of them are more effective than before. But as the results of this study highlight, there has been a change in emphasis in what is essential for success, and a completely different skill set is required to live and learn in the modern digital world, such as information, solution, collaboration, creativity and media fluencies (Jukes, McCain and Crockett 2010). Unlike in the past, when students had to be patient and wait until they could get a chance to use whatever they had learned in real life, today's digital native students can easily and daily experience direct connections. They can participate in profound social revolutions like crowdsourcing and personally significant ones like online voting. Above all, these students are in favour of digital devices as in the digital world they can easily cooperate, compete, share and learn with their peers around the world. This is what the results of this study highlighted.

Because this was an experimental study, it pursued a goal of demonstrating cause and effect relationships between the dependent and independent variables. This study chose the experimental approach for two reasons: firstly, it is the only type of research that directly attempts to influence a particular variable and secondly, it is the best type for testing hypotheses about cause and effect relationships (Fraenkel and Wallen 2014). It aimed to answer the first and third research questions by manipulating the independent variable, *the method of instruction through iPads*, and the study of the dependent variable, *language achievement*. As Fraenkel and Wallen (2014) explain, independent variables frequently manipulated in educational research include methods of instruction, types of assignment, learning materials, etc., and dependent variables include achievement, attitudes, motivation, etc." (pp. 261-262). To control threats to the internal validity this study strictly followed Fraenkel and Wallen's (2014, p. 276) Table of Effectiveness of Experimental Designs in Controlling Threats to Internal Validity (Table 7.1):

Design	Subject characteristics	Mortality	Location	Instrument Decay	Data collector	Testing	Attitude of subject	Regression
Randomized Solomon four-group	++	++	-	+	-	++	-	++
This study	++	++	++	++	++	++	+	++

- The Randomized Solomon four-group design combines the pretest-posttest control group and posttest-only control group designs and provides the best control of the threats to internal validity (Fraenkel and Wallen 2014, p. 268).
- This design is implemented for 80 teaching periods in each of the four groups in the first phase and another 80 periods in the iPad groups in the second phase to provide control of the threats to internal validity and evaluate the effects of the iPad use on language achievement (Best and Kahn 2003; Wiersma and Jurs 2005).

Subject characteristics

- Out of 250 newly admitted students, 80 are randomly chosen for the experiment.
- This design was implemented for 80 teaching periods in each of the four groups in the first phase and another 80 teaching periods in the iPad groups in the second phase to provide control of the threats to internal validity and evaluate the effects of the iPad use on language achievement (Best and Kahn 2003; Wiersma and Jurs 2005).

Mortality

- No mortality was recorded during the experiment

Location

- The study was carried out in students' everyday classrooms, hence; minimizing the risk of harm to the participants (Yin 2009).

Instrument Decay

- Since the instruments of the study were the iPads and online materials, they did not decay during the experiment. If damaged in rare cases, IT specialists helped to repair them immediately.

Data collector • The data was collected through the same method of test-administration. • "The data collector characteristics is a minor problem in the time-series design, although such characteristics may be a problem in other designs if different collectors are used for different methods" (Fraenkel and Wallen 2014, p. 277).
Testing • The subjects took one test at a time during the timed common class. They started the exam together and finished it together. • "The testing threat may be present only when subjects respond to an instrument on more than one occasion" (Fraenkel and Wallen 2014, p. 277).
Attitude of subject • The textbook groups which were exposed to textbook learning were demoralized in the first phase, since they were not allowed to use iPads. This was controlled by providing the textbook groups with iPads in the second phase. However, the iPad groups were not given a chance to use textbooks for learning in the second phase. • "The attitudinal (or demoralization) effect is best controlled by the counterbalanced design since each subject receives both (or all) special treatments. In the remaining designs, it can be controlled by providing another "special" experience during the alternative treatment" (Fraenkel and Wallen 2014, p. 277).
Regression • The participants were of the same gender, age, nationality and level of English proficiency. • The statistical analysis of two progress tests in four groups showed no significant difference in scores within iPad and textbook groups. This means that groups were homogeneous and the treatment worked equally well within both iPad groups as well as within both textbook groups. • "Regression is not likely to be a problem except in the one-group pretest-posttest design" (Fraenkel and Wallen 2014, p. 277).
(++) strong control, threat unlikely to occur *(+) some control, threat may possibly occur* *(-) weak control threat likely to occur*

Table 7.1: Effectiveness of Experimental Designs in Controlling Threats to Internal Validity

7.1 Research Questions

This section reflects upon the research questions set in this study and discusses the extent to which they were answered.

Research Question 1

The first research question was: *Is there a relationship between classes taught through iPads and beginner level Emirati students' language achievement?* An experimental approach was used to answer this research question and enabled this study to determine the changes in student's commitment to language learning caused by the innovative educational technology.

Phase one and phase two post-test analysis showed that both groups recorded higher language achievement results in phase two when exposed to the tool. The statistical analysis for the experimental phase one and phase two revealed that all four groups showed language achievement and positive results throughout their learning process. However, the two iPad groups in phase one, which used iPads for their learning, showed higher post-test and progress test results as compared to the textbook groups, which used paper books for language learning. It is also important to mention that the iPad groups, which lagged behind in phase one, showed considerably higher results in phase two when the textbooks were changed into iPads. According to the Activity Theory, this improvement occurred because of the individual actions which took place in relation to three factors: the available tools, the community and the labor distribution in that community. Hence, according to the statistical analysis and the Activity Theory framework, iPad based learning appears to result in higher language progression. So, the experiment which was run in two phases showed that there is a positive relationship between classes taught through iPads and beginner level Emirati students' language achievement.

Research Question 2

The second research question was: *What are beginner level Emirati students' attitudes toward iPad implementation as a language-learning tool in terms of learner satisfaction, motivation, perceived tool usefulness and learning effectiveness?* This research question was answered through a cross-sectional survey questionnaire, wholly composed of fixed-choice questions. The survey collected data through a questionnaire from students from four groups

under experiment: from two iPad groups in the first phase and two iPad groups in the second phase.

The data analysis showed that self-regulation has a positive effect on students' satisfaction and perceived tool usefulness. In other words, working with iPads raises students' satisfaction level, as well as their level of language achievement. An interactive learning environment has a positive effect on perceived usefulness. Moreover, self-efficacy has a positive effect on the tool usefulness. This means, an interactive learning environment, which supposes communication between students as well as students and the teacher, information sharing and gaining practices, as well as multivariate forms of interactive language learning makes students positive about the usefulness of iPads as a means of language learning. Perceived usefulness in its turn has a positive effect on motivation, which in its turn has a positive effect on learning effectiveness. This looks like a chain reaction in a sense, that students' positive attitudes towards iPads as a means of language learning motivate them to learn the target language, which results in higher language achievement and effectiveness. So, the data collected from the survey questionnaire showed positive student attitudes towards iPad implementation as a language learning tool in terms of learner satisfaction, motivation, perceived tool usefulness and learning effectiveness.

Research Question 3

The third research question was: *Is there a relationship between beginner level Emirati students' attitudes toward iPad implementation as a means of language learning and their language achievement?* This research question was answered through the experiment and the questionnaire. Through the experimental phase data analysis the study recorded positive relationships between the iPad implementation and language achievement. Through the survey data analysis the study recorded positive student attitudes towards iPad implementation as a language learning tool in terms of learner satisfaction, motivation, perceived tool usefulness and learning effectiveness. Since both methods, experimental and survey, showed positive results for the same groups, which used iPads as a means of language learning, it can be stated that there is a positive relationship between beginner level Emirati students' attitudes toward iPad implementation as a means of language learning and their language achievement.

Research Question 4

The forth research question was: *What are the emerging themes of the teachers' reflective journals in the evaluation of their lessons and diagnosis of problems?* The analysis of the 24 reflective journal showed that iPad based learning carries more benefits than textbook based learning in terms of motivation and learning effectiveness. Language achievement is easier, faster and more enjoyable when iPads are used as a means of learning.

7.2 Recommendations

Technology mediated teaching and learning provides language learners and teachers with the means to increase exposure to the target language within the classroom by using online and offline materials. With the use of the iPads in the educational system, number of educational institutions worldwide think it will revolutionize the classroom and replace the textbooks with electronic applications and online materials to engage students in new innovative and interactive ways. Another group of educational institutions are against it and talk in favour of traditional teaching and learning methods. The gap between the Digital Natives and Digital Immigrants is profound, particularly when it comes to language learning and teaching. In fact, the vital issue facing education is that Digital Immigrant teachers, as well as Digital Immigrant parents, who come from the pre digital age, are in a constant struggle when teaching the students who speak a totally new language. The new generation is used to getting information faster than their teachers and parents know how to dispense it, because their parents and teachers are used to taking one thing at a time, while digital natives, however, are used to multitask. Teachers and parents think of the script as prime communicator and the graphic as a backup. Their children, however, prefer the graphics to come before the script. The new generation has been networked most of their lives and has very little patience for long teacher talks, step by step logic, and for "tell-test" instructions (Prensky 2012). Sharing information would be another difference between the two generations. It makes a huge part of today's students' lives, as they think they benefit in being the first to share some information. Whereas, their parents and teachers grew up thinking that information is something secret and must be kept to themselves for future benefit. On the flip side, however, the technology greatly invades people's privacy and opens the doors to situations which many people consider to be unacceptable. The challenge lies in finding a good balance

between the extremes, which may be different in educational settings. There are many other gaps that we observe daily between us and our students and we realize that a glimpse into our students' online world can change a lot. Therefore, it would be central at this point to research and find modern ways of teaching the Digital Native students. Regardless of whether the iPad will be the only tool or one of the many new technological devices used in the classroom, it still needs lots of research and enquiry in its practicality, usefulness and efficiency.

Games have always been motivating for students in language classes. Online games, however, make teachers think twice. They have their pros and cons, but regardless of this, they are being widely used by students outside the classroom. Since they are already educating our students after school, they can be successfully used in formal education. Online games let students reach their highest highs and lowest lows, overcome difficulties and can motivate students to spare no efforts to get to the target. Therefore, it is very important that parents and teachers research the field of online games and learn even more about how to use them for educational purposes. "As more educators and designers shift their focus to complex games, and as parents, teachers, and educators really come to understand what complex games are capable of and why the kids love them so much, a great many of today's resistant adults _ including, hopefully you_ will come around and embrace complex games, in their many forms, as a key educational tool for today's students and for kids in the future" (Prensky 2012, p. 63). So, it would be worth researching what the students are actually learning as they play the online virtual games and how those games could be brought to the classroom.

In this information and technology era, regardless of their preferred professions, graduates are facing growing demands to have high level of English communication skills, in addition to their majors, before entering the workforce. However, many students face difficulties meeting their needs within the limited class hours during their education. To overcome these challenges, many learners are for implementing mobile technologies in their language learning as well as in other discipline areas. This is due to the mobile technologies' facility of allowing access to authentic materials. Though this study managed to show that it is not only enjoyable, quick and easier but also more productive to use mobile technology and particularly iPads in language learning, it did not widen the scope to look at different levels of English proficiency. Therefore, a further study could concentrate on higher levels of English proficiency paperless classrooms and compare iPad based learning with other traditional methods.

This study concentrated on Emirati female students only. Hence, it would be interesting to investigate the ways that integration of tablet technology can change the learning outcomes and attitudes of other nationality second language learners' English proficiency. Which is more, it would be interesting to see if gender plays a significant role in studying with mobile devices or not. Moreover, it would be productive to experiment with iPad related specific tasks and applications to see which exact language tasks, practices and skills can boost higher language achievement.

The results of this study suggest considerable potential for iPads to facilitate students' motivation in language learning. However, this study did not follow the aim of looking into specific ways of doing it. Another study could look into ways of student and teacher collaboration, peer-to-peer interaction and engagement in language learning by the help of iPads and offer new insights into how iPad technology or similar devices can be incorporated into learning and what specific activities can boost student motivation and learning. In addition, it would be a major contribution to the field of the English language teaching to look at different ways of using mobile devices other than iPads to detect beneficial ways, attitudes and practices of using those devices in the paperless language classroom.

7.3 Limitations

There were a number of anticipated and unanticipated limitations to this study, but, where possible, steps were taken to control or prevent them. Though the students were randomly selected, by coincidence there were groups which had students with special needs. To control this limitation, simple main effect analysis was run to determine the mean difference between groups of students who scored at high, average, and low levels on the pre-test.

Another limitation was out of class iPad use. Since this study was based on in-class teaching and learning process, it did not consider out of class iPad use. However, this was a limitation that could only be partially controlled by simply banning the language apps planned for in-class use from out of class use through the Guided Access code control. By setting those codes on students' iPads teachers stopped students from using their iPads for language learning unless the codes were changed. Another limitation that was anticipated was the communication and information exchange between the students during the breaks. Since all four groups under

experiment were in the same college and students shared the same eating and resting areas, they met and communicated. To partially control this limitation, students were informed about the experiment, asked to assist in conducting it and signed a consent form (Table 3.9).

Chapter Eight

Conclusion

Today's language classroom is undergoing an irreversible revolution and one of the most powerful drivers of this transformation is information and communication technologies. "Revolutionary change requires the perception that there is a crisis" (Ouchi and Segal 2003, p. 246). Some teachers would appear to have doubts about reforms as they fear the chaos that innovations might bring. Moreover, they are afraid that the innovative change in the curriculum could grow into their idea of hell. However, today's students are "digital natives" and today's teachers need to listen to the kids they teach (Prensky 2012, p. 105). This study provided evidence of the kind of learning that has a positive impact on language learners' effective progress. The fears that language teachers have expressed found explanation in that access to the mobile device alone is not enough for learning a language as the mobile device in itself is not enough to produce learning outcomes. This study found that progressive language learning outcomes occurred when adequate, yet minimal support was provided for integrating and using iPads for learning a foreign language. iPad based language learning tasks and assignments were a useful way to spark learners' interest, motivation and enthusiasm, and the interactive environment could make it easy for the students to settle down, concentrate and do their best in learning a foreign language. For whatever interactive language learning task the teacher and the students decided to hold, online contest tracking and other ranking or feedback-supporting software was also available to make the teaching and learning process more productive and enjoyable. Not only the interactive mobile learning made the teaching and learning process enjoyable but also developed students' searching, comparing and contrasting, analyzing, critical thinking and decision making, exploring, choosing, planning and evaluating, risk taking and self-assessing skills. The students who are given freedom and choice to explore and create in whatever academic ways they want to as part of their learning coursework are far more willing and motivated than those who do not. The pleasure of observing, grading, evaluating and giving feedback on these efforts must be extremely rewarding for both teachers and students. Teachers are encouraged to give students as much latitude and support as possible for their creative efforts, continuously setting the bar higher and higher and making sure all efforts get shared with the rest of the class.

Many teachers use group and team works that encourage cooperative learning. On the other hand, many teachers bring in games and run other forms of competition with their students. However, not all the teachers try to come to a consensus and balance competition and cooperation in their course planning and designing. Above all, the good balance is a key to successful teaching and learning process, since there are students who prefer only one of the two and are not comfortable with the other. "In many cases, those who are motivated by competition and those motivated by cooperation form very distinct sets, sometimes with an overlap" (Prensky 2012). In this day and time, teachers do not need to worry about it, since most of the interactive language learning programs already have the options programmed and cater for students' individual preferences and learning needs by providing them with a choice of doing the work in one way or the other. Language is, in many ways, the most real subject for students, as it is a real communication with their peers. However, students constantly complain about grammar and lists of vocabulary imposed on them to study. They do not want to learn the language for the grammar or literature, but rather to communicate with their friends and make new friends and acquaintances in other countries. It is worth mentioning that they are already doing a lot of this on their own by Skyping, messaging, texting, tweeting, or simply exchanging audios and videos online. Therefore, "Today's language learning has to be about real communication, not dialogues and pretend" (Prensky 2011, p. 77). Today's language learners are able to communicate easily and quickly with their peers in other places who speak the language they are studying, which is one of the reasons why teachers should run apps that encourage students to join online teams that speak the language being studied. Today, there is no more learning a language for "someday when you go there" (Presnky 2012). On the contrary, as often as possible, students should travel virtually where necessary and communicate in the target language about their real life situations. Hence, the findings of this study will, by all means, help the teachers who resist reforms and innovative changes to overcome their fears, think differently and go out to meet their digital native students in the students' comfort zone.

The medium of instruction in UAE higher education degree programs is English. The medium of instruction in the UAE public primary and secondary programs, on the other hand, is Arabic. The English language is taught as a foreign language. This makes it difficult and extremely challenging for the UAE high school graduates to study degree programs delivered through English language. Therefore, this study was designed and conducted as a response to the

need to improve Emirati language learners' English proficiency and prepare them for undergraduate education delivered through the English language.

"Often the problem is addressed by having high-school graduates attend long post-secondary academic bridging courses in preparation for higher education, but this reduces student motivation" (Gitsaki, Robby and Bourini 2014, p. 168). As Jukes, McCain and Crockett (2010) mention, "Children today are different" (p.20). Based on the observations of these scholars, it must be mentioned that children are different in the ways they think, process or view the world. These differences are the influences of the digital world they live in today and what is more, it holds insightful implications for teachers personally and professionally. The students' experience away from school is highly visual. It is the world of online information which does not involve traditional reading, writing or even traditional ways of thinking. Today's language learners in the class are not the readers and writers the system is designed for, nor are they the readers and writers most teachers have been trained to teach. Above all, they are equipped with 21 century skills that enable them to process audio and visual information more effectively than traditional texts. Which is more, they are used to getting this information in an interactive environment where they are given the ample opportunity to regulate it to serve their needs and experience. "Asking today's students to sit while teachers talk or to do the traditional reading of long passages of uninterrupted text is like trying to fit a round peg in a square hole" (Jukes, McCain and Crockett 2010, p. 122). In order not to demotivate students but motivate them to learn a foreign language, it is necessary to make them feel that the way they are acquiring it is relevant to the online visual world that awaits them when the language course is completed. According to the findings of this study, student motivation could be boosted by providing them with iPad-based language learning, which will assist in shorter term language progression and be more effective than traditional paper and pen methods. Hence, long post-secondary academic bridging programs could easily be replaced with short post-secondary paperless academic bridging programs.

This research study represented an effective collaboration of language learners and language teachers. It examined the needs of Emirati level one students, implemented an experimental language development program and, finally, evaluated the development and the effect of the program on students' language achievement. In terms of the research design, the employment of various measures, and triangulation of the data, this study has provided a great

confidence that educationally motivated language progression occurred through the paperless classroom. Hence, based on the outcomes of this study, firm inferences and recommendations for future mediation programs and student language learning are evident. Baseline language achievement findings highlighted the need for effective mediations and paperless language learning programs, like the iPad based language learning program implemented in this study, to help improve knowledge and motivate language learning in a short period of time.

Given the fact that there is a lack of research in the area of paperless learning, the use of the iPad as a language learning tool is still in its foundation stage. A large body of the existing research studies address mostly matters of iPad implementation and student motivation. With regard to the impact of iPads on students' language acquisition and learning outcomes, paperless learning has not so far been shown to have a significant impact on language achievement. This study managed to address this gap by exploring not only language learners' attitudes and motivations towards the use of iPads for language learning purposes but also by further investigating how the implementation of iPads interrelated with students' learning in an effort to measure language achievement.

According to Offner (1997), language learning is active, creative and accumulative, and language learners must be involved in real life situations and frequently exposed to the target language based on topics relevant to them. In this study, during the experimental phase students were given sufficient prospects to interact with their peers in pairs and groups, face to face and online, through virtual and oral communication, sharing and annotating information they had found on their iPads during individual or group work. Through the use of the iPads students spent a lot of time exposing themselves to authentic language use and being involved in tasks and projects which enhanced their creativity, problem solving, critical and analytical thinking skills, as well as individuality. Curriculum integration with the use of mobile technologies and primarily iPads, involves the development of the iPad as a tool to enhance the language learning. To truly understand the positive effects of iPad based language learning, it is crucial that language teachers fully realize the great many important changes that have taken place in the students who exhibit such a strong desire and need to use mobile devices. Digital technology has been an essential part of the students' lives since birth, and a significant consequence is that they reason and process information in ways fundamentally different from their teachers, who grew up in a much more analog world. In this second generation of mobile technology use the

importance is given to using mobile devices to renovate the teaching and learning process. iPads enable language learners to learn in ways not previously possible. Effective integration of iPads is achieved when language learners are able to select applications to help them obtain information in a timely manner, analyse and synthesize the information, as well as present it creatively. The iPads and other mobile devices should become an integral part of how the classroom functions _ as accessible as all other classroom tools (Mehlinger and Powers 2015). As this study managed to highlight, today's "digital natives", who were level one Emirati language learners, demonstrated a strong preference for using mobile technology for their everyday language learning. This has not only been shown by their preference and positive attitude that motivated them to explore and learn the English language, but also by their test scores, which recorded higher results as compared to traditional methods of using pen and paper for learning. Hence, "It is from the interaction of the human mind and digital technology that the digitally wise person is coming to be" (Prensky 2012, p. 213).

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Appendix A: The Pretest and Posttest

UNIVERSITY *of* CAMBRIDGE
ESOL Examinations
English for Speakers of Other Languages

The table below shows the different parts of KET and how long each paper takes. In KET, Reading and Writing are combined on one question paper.

Name of paper	*Content*	*Time allowed*	*Marks (% of total)*
Paper 1 Reading and Writing	9 parts/56 questions Reading: Parts 1–5 Writing: Parts 6–9	1 hour 10 minutes	50%
Paper 2 Listening	5 parts/25 questions	30 minutes (including 8 minutes' transfer time)	25%
Paper 3 Speaking	2 parts	8–10 minutes per pair of candidates (2:2 format*)	25%

PAPER 1 READING AND WRITING (1 hour 10 minutes)

PART 1

QUESTIONS 1–5

Which notice (A–H) says this (1–5)?
For questions 1–5, mark the correct letter A–H on your answer sheet.

Example:

0 You must use this door between these hours. *Answer:* 0 A B C D E F G

1 Young people and their parents may choose different meals.

2 You can eat here in the evenings.

3 The waitress will show you where to sit.

4 You can stay the night here.

5 You should not usually use this door to go outside.

A
FIRE EXIT ONLY –
NO ENTRANCE TO GARDE

B
Bed and Breakfast
Only £24.95

C
This way to the restaurant garde
⇒

D
Dinner is served in the restaura
until 10.00 p.m. daily

E
There is a special children's menu
please ask your waitress

F
Galaxy Restaurant
We have high chairs for young childr

G
RIVERSIDE RESTAURANT
Please ask us to find you a tab

H
Antec Computers
All staff must use night entrance
8 p.m. – 6 a.m.

PART 2

QUESTIONS 6–10

Read the sentences about working in a library.
Choose the best word (A, B or C) for each space.
For questions 6–10, mark A, B or C on your answer sheet.

Example:

0 Elena ..... a Saturday job working in a library a few months ago.
A got **B** became **C** was *Answer:* 0 A

6 On Saturdays, a lot of people visit the library where Elena works and it is always ..... .
A busy **B** heavy **C** strong

7 'The job is ..... because I meet a lot of different people,' Elena says.
A friendly **B** interesting **C** favourite

8 Her job is to ..... all the books when people bring them back.
A look **B** watch **C** check

9 Elena has to put all the books back on the ..... shelf.
A good **B** possible **C** right

10 Sometimes people ..... to return their books on time.
A think **B** forget **C** mind

PART 3

QUESTIONS 11–15

Complete the five conversations.
For questions 11–15, mark A, B or C on your answer sheet.

Example:

0  Where do you come from? 

A New York.
B School.
C Home.

Answer: 0 A B C

11 Have a good holiday.
A Thanks, I will.
B I think so.
C Yes, very much.

12 What about going shopping this afternoon?
A I'm too tired!
B What a pity!
C That's not right!

13 I can't do my homework.
A Can you be careful?
B You can't have that.
C Of course you can.

14 Which of the boys is your friend?
A He says I'm right.
B Yes he is, isn't he?
C That one over there.

15 I've waited here for two hours!
A Yes you do.
B I'm sorry about that.
C It didn't matter.

QUESTIONS 16–20

Complete the conversation about a game of tennis.
What does Juan say to Rob?
For questions 16–20, mark the correct letter A–H on your answer sheet.

Example:

Rob: Are you free on Saturday afternoon?
Juan: 0 ..D.. *Answer:* 0 A B C D E F G H

Rob: Would you like to play tennis?
Juan: 16 .....
Rob: Yes, at the sports centre at 3 o'clock.
Juan: 17 .....
Rob: That's OK. You'll be fine!
Juan: 18 .....
Rob: About an hour should be enough. We can stop if we get tired.
Juan: 19 .....
Rob: Your house is nearer to the sports centre so I'll see you there at 2.30. We can go in my car.
Juan: 20 .....
Rob: No problem. It'll be fun.

A Are you a good player?
B Great! Then we won't have to walk back. Thanks very much.
C OK. Have you booked somewhere to play?
D Yes. I'm not doing anything.
E Alright. Where shall I meet you?
F You know I haven't played for a long time.
G It's not expensive to play.
H How long are we going to play for?

PART 4

QUESTIONS 21–27

Read the article about two Canadian boys.
Are sentences 21–27 'Right' (A) or 'Wrong' (B)?
If there is not enough information to answer 'Right' (A) or 'Wrong' (B), choose 'Doesn't say' (C).
For questions 21–27, mark A, B or C on your answer sheet.

A great idea!

Frazer and Peter are two 14-year-old boys who grew up in the same small Canadian town. They have always been friends and classmates. Like all their other friends, they enjoy going fishing or swimming at weekends. But for the last few months, they've spent every weekend in Peter's room working on his laptop. This isn't because they have a lot of homework. They have made a new computer word game.

The idea for the game came from Frazer's little brother, Kevin, who had problems with his reading. Kevin learns words more easily by seeing pictures and hearing information than he does by reading. His brother wanted to help. Frazer and Peter worked together for over 200 hours to make a computer game and now it's ready to use. It's a speaking and picture game. For example, if you look at the word 'hat', there's a drawing of a hat next to it and you can hear Peter saying 'Hat! Hat!' at the same time.

The two boys have won a lot of prizes for their computer game and it will soon be on sale around the world. Many schools are interested in buying it.

Example:

0 Peter and Frazer are both teenagers.

A Right **B** Wrong **C** Doesn't say *Answer:* 0 [A] [B] [C]

21 Peter and Frazer go to the same school in Canada.

A Right **B** Wrong **C** Doesn't say

22 Peter and Frazer like doing different sports to their friends.

A Right **B** Wrong **C** Doesn't say

23 For the past few months, the boys have spent most of their time outside.

A Right **B** Wrong **C** Doesn't say

24 Peter and Frazer prefer playing computer games to doing their homework.

A Right **B** Wrong **C** Doesn't say

25 It took less than 200 hours to finish the new computer game.

A Right **B** Wrong **C** Doesn't say

26 In the computer game, you see a picture of a word and hear it spoken.

A Right **B** Wrong **C** Doesn't say

27 Students in other countries have said they would like to use the computer game.

A Right **B** Wrong **C** Doesn't say

PART 5

QUESTIONS 28–35

Read the article about parrots.
Choose the best word (A, B or C) for each space.
For questions 28–35, mark A, B or C on your answer sheet.

Parrots

Perhaps you have seen **(0)** ..... beautiful birds, with their lovely colours and long tails in the forest or in the zoo. Parrots are **(28)** ..... in countries like Brazil, Australia and India. They usually live in large groups and **(29)** ..... they like to eat fruit, they are **(30)** ..... a problem for farmers.

(31) ..... are many different kinds of parrots, but they all have strong beaks and feet, which they use **(32)** ..... climbing and holding food. The biggest birds **(33)** ..... live for up to 80 years.

They are **(34)** ..... noisy, but they are clever birds and it is easy to teach them to talk. Some zoos have parrot shows, where you can see the birds **(35)** ..... things they have learned.

Example:

0 **A** this **B** these **C** them *Answer:* 0 [A] [B]

28 **A** finds **B** find **C** found

29 **A** so **B** that **C** because

30 **A** somewhere **B** sometimes **C** something

31 **A** Here **B** They **C** There

32 **A** for **B** by **C** with

33 **A** can **B** did **C** are

34 **A** more **B** very **C** much

35 **A** done **B** doing **C** does

QUESTIONS 36–40

Read the descriptions of some things you need to enjoy different hobbies.
What is the word for each one?
The first letter is already there. There is one space for each other letter in the word.
For questions 36–40, write the words on your answer sheet.

Example:

0 If you enjoy taking pictures, you'll need one of these. **c** _ _ _ _ _

Answer: 0 c a m e r

36 If you enjoy camping, you'll need this to sleep in. **t** _ _ _

37 People learn to play music on this. **g** _ _ _ _ _

38 If you like reading stories about pop stars, you may need to buy these every week. **m** _ _ _ _ _ _ _

39 People who like walking in the forest need these to keep their feet dry. **b** _ _ _ _

40 If you enjoy watching films at home, you may need to rent this. **v** _ _ _ _

PART 7

QUESTIONS 41–50

Complete the email from Greg to his friend, Anna.
Write ONE word for each space.
For questions 41–50, write the words on your answer sheet.

Example: 0 n o t

From: Greg
To: Anna

Hi Anna,

I'm (0) ..... having a very good week!

Yesterday my team had (41) .....volleyball match, but we lost. The other team played much better (42) ..... we did! Then my friend Jeff, who lives in Australia, telephoned with bad news. He can't come to stay (43) ..... us during the holidays because he's got a summer job. We can't (44) ..... camping together now. And this morning, my sister got (45) ..... late so she rode my bike (46) ..... school! She didn't tell (47) ..... she needed to use (48) ..... . I'm really angry with (49) ..... .

I hope you have some good news! Write back today (50) ..... you can.

Greg

Paper 2
Listening

Part 1

Questions 1 – 5

You will hear five short conversations.
You will hear each conversation twice.
There is one question for each conversation.
For questions **1 – 5**, put a tick (✓) under the right answer.

Example:

0 How many people were at the meeting?

A	B	C
3	13	30
☐	☐	☑

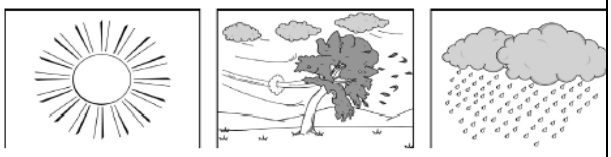
1 What's Jill's favourite food?

A ☐ B ☐ C ☐

2 What time will Barry phone back?

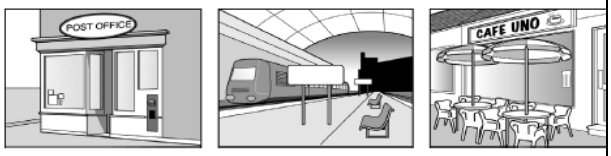
A ☐ B ☐ C ☐

3 What was the weather like last weekend?



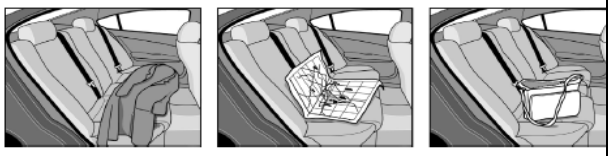
A ☐ B ☐ C ☐

4 Where are they going to meet?



A ☐ B ☐ C ☐

5 What's still in the car?



A ☐ B ☐ C ☐

Part 2

Questions 6 – 10

Listen to Sam talking to Jenny about his birthday presents.
Which present did each person give him?

For questions **6 – 10**, write a letter **A – H** next to each person.
You will hear the conversation twice.

Example:

0 Jenny C

People			Presents	
6	parents	☐	A	belt
7	brother	☐	B	book
8	sister	☐	C	CD
9	aunt	☐	D	chocolate
10	cousin	☐	E	computer game
			F	football
			G	money
			H	sweater

Part 3

Questions 11 – 15

Listen to James talking to a friend about a new music club.

For questions **11 – 15**, tick (✓) **A**, **B** or **C**.
You will hear the conversation twice.

Example:

0 The club is next to the
- A cinema.
- B university.
- C park.

11 The club opened
- A yesterday.
- B a week ago.
- C a month ago.

12 What did James like about the club?
- A the good dancers
- B the fast music
- C the friendly people

13 At the club, you must **not** wear
- A t-shirts.
- B jeans.
- C sports shoes.

14 Yesterday, James's ticket was
- A £5.
- B £7.50.
- C £10.

15 The club stays open until
- A 12.00.
- B 2 a.m.
- C 5 a.m.

Part 4

Questions 16 – 20

You will hear a man telephoning the Tourist Information Centre in Windfield.

Listen and complete questions **16 – 20**.
You will hear the conversation twice.

Trip to Windfield

Name of hotel in centre:		Mill Hotel
Address:	16	24 ..... Road
Cost of single room:	17	£
Telephone number of hotel:	18	
Places to visit:	19	Museum and .....
Museum closed on:	20	

Part 5

Questions 21 – 25

You will hear some information about a food market.

Listen and complete questions **21 – 25**.
You will hear the information twice.

ELWOOD FOOD MARKET

Hall 1 sells:		vegetables
	21	and .....
Hall 2 sells:	22	cakes and .....
Hot breakfast in the café until:	23	
Hall 3		
Piece of pizza costs:	24	
Children's playroom next to the:	25	

PAPER 3 **SPEAKING** (8-10 minutes)

The Speaking test lasts 8 to 10 minutes. You will take the test with another candidate. There are two examiners, but only one of them will talk to you. The examiner will ask you questions and ask you to talk to the other candidate.

Part 1 (5-6 minutes)

The examiner will ask you and your partner some questions. These questions will be about your daily life, past experience and future plans. For example, you may have to speak about your school, job, hobbies or home town.

Part 2 (3-4 minutes)

You and your partner will speak to each other. You will ask and answer questions. The examiner will give your partner a card with some words on it. Your partner will use the words on the card to ask you questions about the information you have. Then you will change roles.

Appendix B: A2 Wordlist for Foundations Level 1

A2 Word List for Foundations Level 1

Word/Phrase CEFR

a bit (adv.) A2 21
a few (det.), (pron.) A2 36
a little (det.), (pron.) A2 19
able (adj.) A2 51
accident (n.) A2 32
across (adv.), (prep.) A2 76
activity (n.) A2
actor, actress (n.) A2 52
actually (adv.) A2 65
add (v.) A2 17
advanced (adj.) A2
adventure (n.) A2
advertisement (also ad, advert) (n.) A2 53
advice (n.) A2 15
afraid (adj.) A2 55
afterwards (adv.) A2 78
against (prep.) A2 49
aged (adj.) A2
ago (adv.) A2 75
agree (v.) A2 68
air (n.) A2 55
airport (n.) A2 56
alcohol (n.) A2
almost (adv.) A2 2
alone (adj.), (adv.) A2 36
along (prep.), (adv.) A2 31
already (adv.) A2 70
amazing (adj.) A2 69
ambulance (n.) A2 22
among (also amongst) (prep.) A2 70
angry (adj.) A2 16
another (det.), (pron.) A2 28
anyone (also anybody) (pron.) A2
anyway (adv.) A2
anywhere (adv.) A2
apartment (n.) A2 57
appointment (n.) A2 75
area (n.) A2 1 4
around (adv.), (prep.) A2
arrive (v.) A2
art (n.) A2 42
artist (n.) A2 33

candy (n.) (NAmE) A2 80
cap (n.) A2 23
capital (n.), (adj.) A2 34
card (n.) A2 50
careful (adj.) A2 67
carefully (adv.) A2 49
carpet (n.) A2 41
carrot (n.) A2 25
case (n.) A2 57
cash (n.) A2 20
castle (n.) A2 35
ceiling (n.) A2 41
cent (n.) (abbr. c, ct) A2 79
centimetre (BrE) (NAmE centimeter) (n.) (abbr. cm) A2 79
centre (BrE) (NAmE center) (n.) A2 37
century (n.) A2 74
certainly (adv.) A2 28
chain (n.), (v.) A2
channel (n.) A2
chat (v.), (n.) A2 47
cheaply (adv.) A2
check (v.), (n.) A2 47
chemist (n.) A2 22
chemist's (n.) (BrE) A2 22
chemistry (n.) A2 42
cheque (n.) (BrE) (NAmE check) A2 20
chicken (n.) A2 24
church (n.) A2 35
cigarette (n.) A2
circle (n.) (v.) A2
clear (adj.), (v.) A2 70
clearly (adv.) A2
click (v.), (n.) A2 46
climb (v.) A2 11
climbing (n.) A2
closet (n.) (especially NAmE) A2 80
cloud (n.) A2 21
club (n.) A2 45
cm (abbr. centimeter) A2 79
coach (n.) A2 22
coldly (adv.) A2
colleague (n.) A2 10 45
collect (v.) A2 50
college (n.) A2 42
coloured (BrE) (NAmE colored) (adj.) A2
comfortable (adj.) A2 19

company (n.) A2 45
competition (n.) A2 46
complete (adj.), (v.) A2
concert (n.) A2 51
congratulations (n.) A2 61
contact (n.), (v.) A2
cooker (n.) (BrE) A2 25
cooking (n.) A2 50
cool (adj.), (v.) A2 21
copy (n.), (v.) A2 46
corner (n.) A2 31
correct (adj.), (v.) A2
cost (n.), (v.) A2 20
could (modal) (v.) A2
countryside (n.) A2 36
cousin (n.) A2 10
cover (v.), (n.) A2 20
covered (adj.) A2
covering (n.) A2
crazy (adj.) A2 70
cream (n.), (adj.) A2 18
cross (n.), (v.) A2 67
crowd (n.) A2 45
crowded (adj.) A2 35
cry (v.), (n.) A2 34
ct (abbr. cent) A2 79
cupboard (n.) A2 39
curtain (n.) A2 41
customer (n.) A2 19
cut (v.), (n.) A2 23
cycling (n.) A2 46
daily (adj.) A2 41
dancer (n.) A2
danger (n.) A2 67
dangerous (adj.) A2 35
dead (adj.) A2 70
decide (v.) A2
deep (adj.), (adv.) A2 12
degree (n.) A2 43
delay (n.), (v.) A2 22
dentist (n.) A2 44
department (n.) A2 53
describe (v.) A2 45
desert (n.), (v.) A2
detail (n.) A2 55
diary (n.) A2 75

difference (n.) A2
dirty (adj.) A2 35
discount (n.) A2 18
discuss (v.) A2 45
dish (n.) A2
document (n.) A2
double (adj.), (det.), (adv.), (n.), (v.) A2
downstairs (adv.), (adj.), (n.) A2 38
Dr (BrE) (also Dr. NAmE, BrE) (abbr. doctor) A2
drawer (n.) A2 40
drawing (n.) A2 50
dream (n.), (v.) A2 19
dressed (adj.) A2
drum (n.) A2 51
dry (adj.), (v.) A2 21
during (prep.) A2 17
dying (adj.) A2
each other (also one another) (pron.) A2 15
earn (v.) A2 20
easily (adv.) A2
east (n.), (adj.), (adv.) A2 34
electric (adj.) A2 40
electricity (n.) A2
elevator (n.) (NAmE) A2 80
else (adv.) A2 26
empty (adj.), (v.) A2 39
engine (n.) A2 47
engineer (n.) A2 43
enough (det.), (pron.), (adv.) A2 25
enter (v.) A2 20
entrance (n.) A2 33
envelope (n.) A2 59
especially (adv.) A2 71
euro (n.) A2
even (adv.), (adj.) A2 71
ever (adv.) A2 72
everyone (also everybody) (pron.) A2
everything (pron.) A2
everywhere (adv.) A2
exactly (adv.) A2
exam (n.) A2 42
examination (n.) A2
excellent (adj.) A2 68
except (prep.), (conj.) A2 60
exercise (n.), (v.) A2 17
exist (v.) A2 11

ice (n.) A2 21
idea (n.) A2 65
if (conj.) A2 78
ill (adj.) (especially BrE) A2 16
immediately (adv.) A2 25
improve (v.) A2
include (v.) A2
including (prep.) A2
indoor (adj.) A2
information (n.) A2
insect (n.) A2 15
instead (adv.) A2
instruction (n.) A2
instrument (n.) A2 50
interested (adj.) A2 48
international (adj.) A2 41
invitation (n.) A2
island (n.) A2
itself (pron.) A2
jam (n.) A2 26
jelly (n.) A2
jewellery (BrE) (NAmE jewelry) (n.) A2 23
join (v.) A2
journey (n.) A2 30
jump (v.), (n.) A2 11
just (adv.) A2
k (abbr. kilometer) A2
keep (v.) A2 46
keyboard (n.) A2 46
kill (v.) A2 35
kilogram (BrE also kilogramme) (also kilo) (n.) (abbr. kg) A2 26
kilometre (BrE) (NAmE kilometer) (n.) (abbr. k, km) A2 31
king (n.) A2
kiss (v.), (n.) A2
km (abbr. kilometer) A2 79
l abbr.litre A2 79
lake (n.) A2 36
lamp (n.) A2 41
large (adj.) A2 19
latest (adj.), (n.) A2 23
laugh (v.), (n.) A2 14
lazy (adj.) A2 14
least (det.), (pron.), (adv.) A2 71
leather (n.) A2 23
left (adj.), (adv.), (n.) A2 31
lemon (n.) A2 25

lend (v.) A2 63
less (det.), (pron.), (adv.) A2
let (v.) A2 66
level (n.), (adj.) A2
library (n.) A2 43
licence (BrE) (NAmE license) (n.) A2
license (v.) A2
lie (v.), (n.) A2 57
lift (v.), (n.) A2 38
line (n.) A2 68
list (n.), (v.) A2
litre (BrE) (NAmE liter) (n.) (abbr. l) A2 26
look after (especially BrE) A2 36 71
lose (v.) A2 49
lost (adj.) A2
loud (adj.), (adv.) A2 34
lovely (adj.) A2 19
low (adj.), (adv.) A2 45
luck (n.) A2 61
lucky (adj.) A2
luggage (n.) (especially BrE) A2 56
machine (n.) A2 39
mad (adj.) A2 70
magazine (n.) A2 53
magic (n.), (adj.) A2
make sure A2 53
make
-up (n.) A2 40
manager (n.) A2 43
map (n.) A2 58
mark (n.), (v.) A2 42
market (n.) A2 35 58
married (adj.) A2
match (n.), (v.) A2 26
mathematics (also maths BrE, math NAmE) (n.) A2 42
matter (n.), (v.) A2 16
may (modal) (v.) A2 36
maybe (adv.) A2 65
mean (v.) A2
medicine (n.) A2 23
meeting (n.) A2 45
member (n.) A2
memory (n.) A2 37
menu (n.) A2 28
metre (BrE) (NAmE meter) (n.) A2
midday (n.) A2

middle (n.), (adj.) A2 46
midnight (n.) A2
might (modal) (v.) A2 54
mine (pron.), (n.) A2
mineral (n.), (adj.) A2 28
mirror (n.) A2 40
miss (v.), (n.) A2 30
missing (adj.) A2
mistake (n.), (v.) A2
mix (v.), (n.) A2
mixed (adj.) A2 69
model (n.) A2
modern (adj.) A2 35
moment (n.) A2 69
moon (n.) A2 11
most (det.), (pron.), (adv.) A2 53
motorcycle (BrE also motorbike) (n.) A2 79
mountain (n.) A2 34
mouse (n.) A2 46
move (v.), (n.) A2 46
movie theater (n.) (NAmE) A2 80
Ms (abbr.) A2
musical (adj.) A2 50
must (v.) A2 60
myself (pron.) A2
national (adj.) A2 41
nature (n.) A2
nearly (adv.) A2
neck (n.) A2 12
negative (adj.) A2
neighbour (n.) A2 38
net (n.) A2 49
news (n.) A2 53
next to (prep.) A2 76
no one, nobody A2
nobody (also no one) (pron.) A2
noisy (adj.) A2 70
normal (adj.), (n.) A2
north (n.), (adj.), (adv.) A2 34
nothing (pron.) A2 35
notice (n.), (v.) A2 32
nurse (n.) A2 44
off (adv.), (prep.) A2 18
offer (v.), (n.) A2 66
office (n.) A2 30
oil (n.) A2 28

rich (adj.) A2 70
riding (n.) A2
ring (n.), (v.) A2 29
rock (n.) A2 12
roof (n.) A2 30
round (adj.), (adv.), (prep.), (n.) A2 31
rounded (adj.) A2
rubber (n.) A2
ruler (n.) A2
runner (n.) A2
running (n.) A2 20
salad (n.) A2 28
sale (n.) A2 18
sauce (n.) A2 28
save (v.) A2 20
science (n.) A2 11
scissors (n.) A2 26
screen (n.) A2 46
seat (n.) A2 27
secretary (n.) A2 44
sell (v.) A2 20
serve (v.) A2
several (det.), (pron.) A2 41
shall (modal) (v.) A2 65 51
share (v.), (n.) A2 14
sheet (n.) A2 40
shelf (n.) A2 39
ship (n.) A2 12
should (modal) (v.) A2 22
shout (v.), (n.) A2 34
shut (v.), (adj.) A2 11
sick (adj.) A2 22
side (n.) A2 33
sign (n.), (v.) A2 59
silver (n.), (adj.) A2 31
simple (adj.) A2 69
since (prep.), (conj.), (adv.) A2 75
singer (n.) A2 50
singing (n.) A2
single (adj.) A2
sink (v.) A2 12
sit down A2 11
size (n.) A2 19
sky (n.) A2 36
slice (n.), (v.) A2
slowly (adv.) A2

snake (n.) A2 15
so (adv.), (conj.) A2 77
soap (n.) A2 40
sock (n.) A2 18
soft (adj.) A2 69
software (n.) A2 43
somebody (also someone) (pron.) A2
somewhere (adv.) A2
song (n.) A2 50
sort (n.), (v.) A2 43
soul (n.) A2
sound (n.), (v.) A2 64
south (n.), (adj.), (adv.) A2 34
space (n.) A2 11
speaker (n.) A2 46
special (adj.) A2 61
spell (v.), (n.) A2
spelling (n.) A2
spend (v.) A2 10
spoken (adj.) A2
spoken, speak A2
spoon (n.) A2 28
spring (n.) A2
square (adj.), (n.) A2 31
staff (n.) A2 55
stage (n.) A2
stair (n.) A2 38
stamp (n.), (v.) A2 59
stand (v.), (n.) A2
star (n.), (v.) A2 52
steal (v.) A2 35
still (adv.), (adj.) A2 68
stomach (n.) A2 12
storm (n.) A2 21
story (n.) A2 52
stove (n.) A2
straight (adv.), (adj.) A2 31
strange (adj.) A2 70
strong (adj.) A2 70
such (det.), (pron.) A2
such as A2
suit (n.), (v.) A2 18
suitcase (n.) A2 54
suppose (v.) A2 65
sure (adj.), (adv.) A2
surname (n.) (especially BrE) A2

surprise (n.), (v.) A2
surprised (adj.) A2 16
sweater (n.) A2 18
swimming (n.) A2
take sth off A2 40
tape (n.) A2
team (n.) A2
temperature (n.) A2 22
term (n.) A2 43
terrible (adj.) A2 36 66
text (n.) A2
thank (v.) A2
the rest A2
the Web (n.) A2
theatre (n.) A2 80
theirs (pron.) A2
themselves (pron.) A2
thin (adj.) A2 13
thinking (n.) A2
thirsty (adj.) A2 16
through (prep.), (adv.) A2 76
throw (v.) A2 48
tidy (adj.), (v.) A2 27
tie (v.), (n.) A2 18
timetable (n.) A2 29
tire (v.) A2 21
toe (n.) A2 12
top (n.), (adj.) A2 18
tour (n.), (v.) A2 58
tourist (n.) A2 55
towel (n.) A2 40
toy (n.), (adj.) A2 31
traffic (n.) A2 32
trip (n.), (v.) A2 22
true (adj.) A2
try (v.) A2 23
tune (n.), (v.) A2 44
turn (v.), (n.) A2 39
twice (adv.) A2 17
type (n.), (v.) A2 45
tyre (n.) A2 21
umbrella (n.) A2 18
uncle (n.) A2 10
underground (adj.), (adv.) A2
unfortunately (adv.) A2 43
unhappy (adj.) (opposite = happy) A2 16

uniform (n.), (adj.) A2
unusual (adj.) (opposite = usual) A2 70
upset (v.), (adj.) A2
upsetting (adj.) A2
upstairs (adv.), (adj.), (n.) A2 38
used (adj.) A2
useful (adj.) A2 70
usually (adv.) A2 17
variety (n.) A2 43
various (adj.) A2 50
video (n.) A2
view (n.), (v.) A2 38
visitor (n.) A2
vocabulary (n.) A2
walking (n.) A2
wallet (n.) A2 80
war (n.) A2 53
washing (n.) A2 27
way (n.) A2 31
weekly (adj.) A2
welcome (v.), (adj.), (n.), (exclamation) A2 61
well known (adj.) A2 51
west (n.), (adj.), (adv.) A2 34
wet (adj.) A2 21
wheel (n.) A2 21
while (conj.), (n.) A2 78
whole (adj.), (n.) A2
wide (adj.) A2 70
wild (adj.) A2 15
win (v.) A2 49
winner (n.) A2 42
winning (adj.) A2
without (prep.) A2
wonderful (adj.) A2 36
wood (n.) A2 36
wooden (adj.) A2 31
wool (n.) A2 31
worker (n.) A2
worried (adj.) A2 16
worry (v.), (n.) A2 66
worrying (adj.) A2
worse, worst, bad A2 42
yeah (exclamation) A2 77
yet (adv.), (conj.) A2
yours (pron.) A2
yourself (pron.) A2

Appendix C: Evaluation of Articles

The questions have been generated following the module texts: Glesne (2011), Kvale (1996), Emerson, Fretz, and Shaw (2011), Stake (1995) and Merriam (2009)							
Study	**Study purpose** *Are the research objectives/questions defined and focused?*	**Theoretical issues** *Is a qualitative approach appropriate to answer the research question?*	**Study design** *What kind of study is it?*	**Methodology** *What methods are used? Are the methods appropriate for the research question?*	**Methodology** *Are the procedures for data collection fully described?*	**Methodology** *Is it likely that the researcher is biased?*	**Results** *Are the findings presented clearly?*
1. A study of participatory action research as professional development for educators in areas of educational disadvantage	✓	✓	Action research	**Interviews**, focus groups	✓	⊘	✓
2. Technology integration in the schools of Guyana: A case study	✓	✓	Case study	Surveys, reports, **interviews**, observations	✓	⊘	✓
3. Devices and Educational Change	✓	✓	Case study	Interviews	✓	⊘	✓
4. Teachers' instructional scaffolding in an innovative information and	✓	✓	Case study	Video and audio tapes, **interviews**, questionnaires	✓	⊘	✓

communication technology-based history learning environment							
5. Teachers' feelings during curriculum change in the UAE: opening Pandora's box	✓	✓	Case study	Semi-structured group **interviews**, document reviews	✓	⊘	✓
6. The paradox of IT in primary schools: E-learning is new but gender patterns are old!	✓	✓	Ethnographic case study	**Interviews**, observations	✓	✓	✓
7. Teacher professional development for technology integration in a primary school learning community	✓	✓	Case study	Instructional observations, reflections	✓	⊘	✓
8. Examining the impact of educational technology courses on pre-service teachers' development of technological	✓	✓	Case study	**Interviews**, document review, observations	✓	⊘	✓

pedagogical content knowledge							
9. Using technology for enhancing teaching and learning in Bangladesh: Challenges and consequences	⊘	✓	Mixed method	Observations, semi-structured **interviews**	✓	⊘	✓
10. ICT in English schools: transforming education?	⊘	✓	Empirical study	**Interviews** ⊘	✓	✓	✓
11. Innovation in higher education in China: are teachers ready to integrate ICT in English language teaching?	✓	✓	Mixed method	Semi-structured **interviews**, focus groups	✓	✓	⊘
12. Persistence and motivation	⊘	✓	Intrinsic case study	E-mail ⊘	✓	⊘	✓
13. Digital technologies and English instruction in China's higher education system	✓	✓	Mixed method	Document reviews	✓	⊘	✓
14. Norwegian secondary	✓	✓	Mixed method	Focus group interviews ⊘	✓	⊘	✓

school teachers and ICT							
15. Affect and acceptability: exploring teachers' technology-related risk perception	✓	✓	2-phase mixed method	Semi-structured **interviews**, informant interviews, observations, document analysis	⊘	⊘	✓

Appendix D: Reflective Journals in phase 1

Week 1	
***Unit 1: What kind of person are you?* Reading and Writing** (Q: Skills for Success _ Reading and writing) **Learning outcome**: *Write sentences to describe your personality, appearance, and interests.* ***Unit 1: What are you interested in?* Listening and Speaking** (Q: Skills for Success _ Listening and writing) **Learning outcome**: *Interview a classmate about his/her interests and introduce him/her to class*	
***Reading**: Identifying main topics and main ideas* ***Vocabulary**: descriptive adjectives* ***Grammar**: Present of be, affirmative present* ***Listening**: Listening for example* ***Pronunciation**: Simple present third person –s/-es* ***Speaking**: Keeping a conversation going*	
iPad group1	***iPad group2***
Week one commenced with orientation and introduction to iPad apps. Students had some issues with operating the programs and needed assistance. However, when technical problems were solved, students managed to work with the interactive e-book and covered unit 1 from both e-textbooks. The new vocabulary and grammar were introduced and practiced through writing, speaking and listening. Students did two reading texts "What kind of person are you?" (p.5) and "Cristiano Ronaldo" (p.10) and worked on the following reading skills: identifying topics and main ideas. Grammar was introduced and practiced through e-textbook exercises, as well as through e-games and board activities. Students then used unit vocabulary and grammar to write short answers to questions about their personality	Though we had couple of technical glitches with iPad apps and e-book codes, we successfully went through this first week. Students learned how to make affirmative statements and write shor answers. They previewed both e-texts usin of strategies. They read for main ideas, det looked at different text types. They comple book exercises as well as extra reading acti online. Students learned how to write an ou before writing a paragraph. They did all vocabulary exercises and practiced the new words and grammar through the iMovie project.

Technical issues

iPad based tasks

Technical issues

iPad based tasks

and appearance. The mini project of the week was to interview the classmate about her interests and introduce her to class using the app called *iMovie*, where they had to write short sentences about their friend, put videos or pictures and record their voce while speaking about their friend.	
Teacher's reflection Though it was the first week of teaching and technical issues wasted almost one teaching period, eventually students did very well in handling the technology for learning. Most students were comfortable and confident in operating the apps. However, there were also students who struggled to write or read on the tablet screen. When asked to produce verbal answers those students mostly gave correct answers. I placed those students with the ones who were good with technology (indirectly through pair and group works) so that they could cooperate and feel comfortable. I can note that they did feel more reluctant after that. I was impressed with the mini projects that the pairs quickly and easily produced through the iMovie. Not only the unit vocabulary and grammar were mostly used accurately, the mood and motivation apparently took over the hard work. Overall, I was satisfied with my students' progress this week, which I could follow daily through the digital grade book. It provided me immediate assessment of my students' progress. On the 5th teaching day I projected the class report	***Teacher's reflection*** The class was active and inspired. Learning became alive for the students while they were creating something that was new and meaningful to them. One of the tasks they enjoyed doing was the iMovie project which they did in pairs. They liked working with the interactive textbook. I had two students constantly asking for permission to write on a paper. They explained that they got irritated when writing on the screen and that the space for writing was too small. I suggested to use a stylus for writing and working on iPads. Next day they came with their styluses. Though they were not quite happy and willing to work on iPads, they tried to do their best. They had trouble remembering the-s ending on the verb used with *he, she, it*. To practice this grammar aspect we downloaded *Tense Buster* app and practiced it through various interactive exercises. The goal of the unit was successfully achieved. At the end of the unit students were able to write sentences to describe their personality, appearance and interests.

L-ing effctnss

L-ing effctnss

Percieved satisfaction

for the group to let them view their achievement and gave comprehensive feedback on what they had mastered and what extra apps they could use for independent work and practice. On this note I will say I had a strong feeling that students made friends with iPads and found it easy to work with them to achieve their goals.	

Ease of use

Week 1	
***Unit 1: What kind of person are you?* Reading and Writing** (Q: Skills for Success _ Reading and writing) **Learning outcome**: *Write sentences to describe your personality, appearance, and interests.* ***Unit 1: What are you interested in?* Listening and Speaking** (Q: Skills for Success _ Listening and writing) **Learning outcome**: *Interview a classmate about his/her interests and introduce him/her to class*	
***Reading**: Identifying main topics and main ideas* ***Vocabulary**: descriptive adjectives* ***Grammar**: Present of be, affirmative present* ***Listening**: Listening for example* ***Pronunciation**: Simple present third person –s/-es* ***Speaking**: Keeping a conversation going*	
Textbook group1	***Textbook group2***
Classes commenced with the textbook called: Oxford Q: Skills for Success. Students completed unit 1 from both books: *Reading and Writing* and *Listening and Speaking*. They successfully did vocabulary exercises and answered the unit questions in complete sentences. However, those answers didn't come easily as most of the students couldn't see the difference between do and does, the –s ending and –no ending, etc. After completing several extra activities students finally	We started the unit with the reading texts. Students looked at book photos as they read the captions. Then we discussed the vocabulary and learned new words. Then we learned how the context clues help us figure out what specific words mean. Students completed all reading activities in groups or pairs. Grammar and writing took most of the class time. Common student errors with *be* included using the wrong subject or omitting the subject. Others automatically added the form of *be* after the subject

B is not easy

T-er made material

Time consuming

T-er made material

Interactive project

were able to make correct sentences. Other than the grammar there were no issues with reading, listening or writing skills. Students successfully completed unit 1 from both books. The end of the week project created a big enthusiasm in the group. Students had to choose somebody from the group and introduce her to the class by describing her personality and interests.	pronoun. The book activities were not enough to practice and understand Present of be and I brought in extra materials every day. *Introduce your friend* project went really well. They had fun and tried their best to express themselves to introduce their friends through the project they did in pairs.
Teacher's reflection I felt classes were boring for the students and they complained about not having interesting exercises in the book. I tried to make the textbook more interesting for them by creating competitions and games, which took lots of effort and time to think and come up with something new. Another drawback was the grammar issue with *do* and *does*. I had to create extra materials and adapt exercises, print, cut, and prepare them for group or pair work. I wouldn't go through this if students had interactive e-textbooks of course. My time and efforts were fruitful, because the students could eventually understand the grammar aspect and use *do* and *does* correctly. I felt the last day of the week was the most interesting for the students because they had to work on a mini project. When I asked them why they were so happy and enthusiastic about the project they simply reasoned that it was different from book based activities.	***Teacher's reflection*** It was a long week. Students were new to college system and life. It took them long to settle down and concentrate on their lessons. They easily got tired of the textbook but had fun with listening exercises and discussions. They also liked the activities that I put on the board, such as find the half, or unscramble the sentences. It was a long but a productive week.

B is boring

Time consuming

T-er made material

S enjoy interactive tasks

boring

Interactive project

B is boring

T-er made material

Week 2	
Unit 2: Who are your friends? (Q: Skills for Success _ Reading and writing) **Learning outcome**: *Write complete sentences about three friends using descriptive adjectives* ***Unit 2: How do you make friends?*** (Q: Skills for Success _ Listening and speaking) **Learning outcome**: *Give a presentation that describes some good ways to make friends, including details and examples*	
***Reading**: Identifying topics and main idea* ***Vocabulary**: Word families* ***Grammar**: Simple present* ***Writing**: Editing for capitalization and punctuation* ***Listening**: Listening for example* ***Pronunciation**: Sentence intonation* ***Speaking**: Adding more information*	
iPad group1	***iPad group2***
This week the group learned how to describe photos and pictures. They read the text "Different Kinds of Friends" and created an auto picture with a voice description on their iPads. Students also listened to the audio while they read the text. The exercise enabled them to stop the audio at any point they wanted to take notes or listen again for correct pronunciation. They easily and quickly completed all reading exercises. Simple present was introduced and practiced through textbook and Tense Buster exercises. The interactive exercises allowed students to redo the difficult parts and get immediate auto feedback. The new vocabulary was practiced through e-book and other online interactive exercises. Comprehension checks were done through	This week students reviewed what nouns, verbs and adjectives were and came up with definitions. They made questions, described e-book pictures and photos, read the texts and completed all comprehension check exercises. They discussed suffixes and focused on the most commonly used words with *–ness* and *-ful*. They practiced this through completing sentences and charts. Students learned about different kinds of friends through reading passages and discussions. They then used the labels from the reading when they described their own friends in writing. Simple present was introduced and practiced through both e-book exercises and Tense buster app. It was important for students to understand that *do* is also

Perc-ed satisfaction

Ease of use

L-ing effectiveness

Interactive L-ing environments

iPad based tasks

Interactive L-ing environments

collaborative tasks; asking and answering questions and sharing students' voice recordings with the teacher. Then students were asked to create a presentation on their iPads using the app: Keynote on *Good ways to make friends*. This presentation they created in groups of 3 and successfully presented through mirroring.	used as a verb, usually related to the concept of work. So, they went ahead and found other grammar apps to practice this in class and shared those apps with others to try and practice. The project of the week was the Keynote presentation about making good friends. Students did their best to come up with impressive in-class presentations.
Teacher's reflection It was a very intensive and fun learning week. Students got handy with the iPads and completed operations with ease. Everybody seemed to be motivated and willing to try various interactive functions for their learning. For example, one of the students suddenly exclaimed "Miss, it said well done to me." Apparently she had answered all questions correctly and got a positive reinforcement from the program. Another student suggested an app to practice reading which we all tried in class and benefited. They did nice presentations. It was evident that they tried hard to produce the language but had fun creating and designing them. They used all sorts of audio and visual effects which made this presentation assignment fun for them to create. In short, I liked to see my students motivated, confident and hands on learning.	***Teacher's reflection*** Increased classroom productivity and efficient time management were key aspirations of this week. Students worked with such motivation and speed that on the third day of the week there were no unit exercises left blank. I was impressed with students' initiative of finding and exploring various apps to practice grammar and share with each other. From the final project it was obvious that the unit outcomes were achieved. The slides mostly contained correct present tense sentences and descriptive adjectives. Speech was fluent and contained relatively accurate descriptions of ways to make good friends. Overall, it was a very productive week.

Motiv ation

Motiva tion

Ease of use

Perc-ed useful

Interactive L-ing environme nts

Self-efficacy

Perc-ed usefuln ess

L-ing effect-ss

Interactiv e l-ing environm ent

Perc-d satisfac tion

Week 2

Unit 2: Who are your friends?

(Q: Skills for Success _ Reading and writing)

Learning outcome: *Write complete sentences about three friends using descriptive adjectives*

Unit 2: How do you make friends?

(Q: Skills for Success _ Listening and speaking)

Learning outcome: *Give a presentation that describes some good ways to make friends, including details and examples*

***Reading**: Identifying topics and main idea*

***Vocabulary**: Word families*

***Grammar**: Simple present*

***Writing**: Editing for capitalization and punctuation*

Textbook group1	***Textbook group2***
The group discussed ways they made friends and types of friends they had. In small groups students came up with answers to questions like: *where do you meet people? How do you start conversation? What things do you do with your friend*? Students read the texts and completed the reading exercises. I played the audio and had them read along silently and complete some exercises individually. We learned what word family is and looked at parts of the speech. This was practiced through sentence and dialogue writing in pairs and groups. The units were long and the students hardly managed to complete all tasks and exercises from both books. However, they got some time on Thursday to give a poster presentation describing some good ways to make friends.	The group did very well this week. They studied about different kinds of friends and had active discussions about the ways they choose their friends. They used the new vocabulary and labels from the reading passages when they tried to describe their own friends in speaking and writing. Grammar took little bit longer than expected because each and every student needed feedback on any written piece produced. They were placed in groups to complete those written tasks so that they could get immediate and practical peer feedback. They also learned how to brainstorm before writing a paragraph and shared their variants with each other. Students did the reading passages and completed all comprehension activities from the book. They, as well, listened to the texts and dialogues and did the listening and speaking exercises. Thursday was spent on the poster presentation preparation and oral presentation. It was about the ways they choose and make friends.

Teacher's reflection This week went slowly but steadily. Students manipulated language structures kinesthetically. Handwriting was vital at this point for spelling and foundational literacy. It took them time to write and complete the book exercises. Hence, the biggest concern of the week for me was the lack of time. This week I didn't have to supplement a lot, but a couple of activities to practice the present simple tense. This was due to the lack of class time for extra activities since the units were tense and completing written tasks and activities took students long to finish. Another reason for running out of time was that, some students needed constant reassurance that what they did was correct and that they were going in the right direction, so they needed immediate teacher feedback to keep them moving all the time. I guess, this will be an issue for the coming weeks too.	***Teacher's reflection*** This week I became aware of my students' weak and strong points and was needed every single minut give verbal and written feedback to individual students as well as to groups of them. It required a considerable amount of guided stud time inside the classroom to enable understanding and retention of unit content.

B is not easy

B is time consuming

B is not easy

Individual T feedback

Book based activities

Individual T feedback

B is time consuming

Week 3
Unit 3: Do students spend too much time in school? (Q: Skills for Success _ Reading and writing) **Learning outcome**: *Give information about a school using descriptive adjectives and adverbs* ***Unit 3: What makes a good school?*** (Q: Skills for Success _ Listening and speaking) **Learning outcome**: *Share your opinions to plan a perfect school and present your plan to the class*
***Reading**: Scanning for names, dates, and times*

***Vocabulary**: Vocabulary log, using the dictionary: antonyms*

***Grammar**: Adjectives; adverbs + adjectives*

***Writing**: Editing for capitalization and punctuation*

***Listening**: Listening for example*

***Pronunciation**: Sentence stress*

***Speaking**: Giving opinions*

iPad group1	***iPad group2***
Students discussed the following questions in class: Do you sometimes study in the library? *Do you like to study in the library? Why or why not? How many hours do you spend sleeping every day? etc*. They drew on their answers from previous activities and quickly referred back to their e-notes from previous units. Students read the two texts called: *Comparing schools in three countries* and *Schools around the world*. They scanned for names, dates and times first and then read the texts. They listened to the audio as they read. They were asked to pause or listen again to the necessary parts for better understanding of the text and pronunciation of the words and word stress in the text. Then they did vocabulary building exercises and completed the critical thinking and comprehension check tasks. In grammar skill students learned adverbs of degree, which are placed before an adjective. They learned how to describe manner or degree and answer the questions *when, where, how often, and how much*.	This week the class talked about good schools and time spent in school. The vocabulary was introduced and practiced through the e-book and extra e-exercises. Students liked the expansion activity a lot on page 36. They worked in pairs to plan a tour of their college. They drew a map and decided where the tour began and ended, and what places had to be on the tour. They read both reading passages from the unit about comparing schools in different countries and scanned for names, dates and times. Then they answered the comprehension check questions and got involved in small discussions about their schools. They used the notes and vocabulary logs to express opinion and bring reasons for their answers. Adjectives and adjective + adjective grammar was introduced and successfully practiced through e-book and various extra apps. They also made sentences and highlighted adjectives in them. Then they learned how to brainstorm and write a paragraph about their college. This week students completed unit 3 in both books and did all in-book exercises, as well as extra activities to develop their language skills.

Ease of use

iPad based tasks

Self-regulation

Motivation

Interactive l-ing environment

Ease of use

Perceived satisfaction

Teacher's reflection	***Teacher's reflection***
On the first day of the week students had their progress test 1. This week I noticed that iPads as a means of language learning allowed information to be reinforced and expanded while accommodating different **learning styles** and **developing practical skills**. When finished earlier than others, they collaborated in class by sharing their writings, answers and other useful information. It was a fruitful and technologically enhanced week for the students.	The week went very well. Students worked with their iPads at all times and conducted their studies on them. This helped the students a lot because they were given an opportunity to have a second chance at rewriting where their answers were incorrect and when they received their auto-feedback they got another chance to redo the wrong parts again. In addition to being able to review and rewrite the items they answered incorrectly, students had access to a video review of the models and hints to correct themselves. This has been a vastly superior learning practice for these 3 weeks. We never ran out of time or had time management issues, as digital files streamlined simple tasks such as distributing, collecting, on-spot marking, etc. Besides, sharing and collaborating on digital exercises and worksheets was a breeze and I witnessed how much students enjoyed those practices. I found that students felt more comfortable sharing their ideas and produced work through iPads, and, even the **students who typically were shy or didn't have many friends in class felt like they could fit in**.

Perceived usefulness

Self-regulation

Interactive l-ing env.

L-ing effectiveness

Ease of use

Interactive l-ing env.

Motivation

Self-regulation

Self-efficacy

iPad based tasks

Perceived usefulness

Perceived satisfaction

Week 3
Unit 3: Do students spend too much time in school? (Q: Skills for Success _ Reading and writing) **Learning outcome**: *Give information about a school using descriptive adjectives and adverbs* ***Unit 3: What makes a good school?*** (Q: Skills for Success _ Listening and speaking) **Learning outcome**: *Share your opinions to plan a perfect school and present your plan to the class*

***Reading**: Scanning for names, dates, and times*

***Vocabulary**: Vocabulary log, using the dictionary: antonyms*

***Grammar**: Adjectives; adverbs + adjectives*

***Writing**: Editing for capitalization and punctuation*

***Listening**: Listening for example*

***Pronunciation**: Sentence stress*

***Speaking**: Giving opinions*

Textbook group1	***Textbook group2***
The group successfully worked with the book exercises and completed all of them individually, in pairs and in groups. We conducted discussions about the school day length and time for homework and fun. Students were quite active in expressing their opinions and volunteering to contribute to the discussion. Students read the texts and worked with the vocabulary. They took notes as they read and filled their vocabulary logs with new words. Then they used those notes to write sentences about their Emirati schools. Grammar was also introduced and practiced through textbooks and teacher-made worksheets. Listening exercises were followed by speaking and critical thinking ones which students completed successfully.	We followed the work plan and managed to study unit 3 in both textbooks. We read the texts, scanned for specific information, played small games practicing the new words and conducted mini discussions about schools, school rules, and time spent on homework. We looked at adjectives and adverbs of degree, which are placed before the adjective. We made sentences and discussed examples and then completed the book exercises and discussed the answers for feedback. Though I had prepared extra grammar activities for them, we didn't manage to get to those activities because of time constrains. We listened to texts, dialogues and conversations and did group and pair activities.
Teacher's reflection	***Teacher's reflection***
It was a hands-on week and students worked really hard. This week, a lot of time was taken for in-class individual feedback. I was kept on my toes by 20 students who sought individual feedback on vocabulary and grammar as they finished completing their exercises. While it is	It was a cooperative and communicatively oriented week and students could acquaint themselves with appropriate language use. The newly explained language was used in contexts that involved basic principles of appropriateness. Making those concepts clear and following up with their applications made the students confident about

B is time consuming

Individual T feedback

Interactive work

B is time

important to moderate persistent students, it is all more important to convey through attitude that questions are most welcome. In large classes like this, students hesitate to come forward to ask questions and they need you to approach them individually and spend some time explaining and clarifying their doubts about specific tasks and language points. I noticed some **students were too shy** to express themselves in class and didn't want others to see their work. I tried to make it clear that error-making is not at all disgraceful but a natural and common practice. Still, it was a challenge to encourage those students to talk or group them and assist with the task. To overcome this problem, I put commonly asked questions on board and conducted a discussion about those points encouraging everyone to express themselves and ask questions right away. It still took me a lot of time to create extra materials that could provide my students with suitable situations and encourage them to ultimately use the rules in real-life communication. Overall the week was challenging but successful.	what they had learned. They enjoyed working in groups and pairs. They cheered up when having group competitions and interactive tasks and kept asking for more. The time issue was still of big concern. Though I had created extra help for students, no extra activities were given time to. This week I noticed students piling up at my desk after classes (especially the struggling students who hardly participate in class) at break times and wanting me to look at their work or give extra help. Though it occupied all my free time, I was happy to see them work and responsible for their studies.

B is time consuming

Week 4

Unit 4: When do we eat special food?

(Q: Skills for Success _ Reading and writing)

Learning outcome: *Describe the people, food, and activities at a celebration*

Unit 4: How do you choose you food?

(Q: Skills for Success _ Listening and speaking)

Learning outcome: *Develop and tell a story about a personal experience using information on what makes a good story*

***Reading**: Scanning for information*

***Vocabulary**: using the dictionary, prefixes and suffixes*

***Grammar**: verbs + gerunds or infinitives*

***Writing**: writing complete sentences*

***Listening**: Listening for reasons*

***Pronunciation**: Stressed syllables*

***Speaking**: Giving opinions*

iPad group1	***iPad group2***
Food was my students' favourite topic and they worked this week with double power. They watched the book videos and completed comprehension tasks. Volunteer students introduced recipes and added to the new wordlist. The vocabulary was practiced through group discussions, reading texts and listening pieces. The group scanned the text: *Celebrating the New Year with food* for specific information, such as special food in every country introduced in the text, dates of celebrations, traditions in each country, etc. They looked at dictionary entries and answered different questions about definitions and forms of those entries. The group looked at gerunds and infinities as words for activities and discussed examples of verbs + gerunds, verbs + infinities and verbs + infinitives or gerunds. Students completed various e-textbook and extra activities to better practice the grammar skill. Those activities they did individually, in pairs and groups. Then they practiced the new vocabulary and grammar in writing about special meals in their country and sharing their writing pieces with the rest of the class through Bblearn and Dropbox apps.	This week was around food and celebrations. Students read the text on page 51 about celebrating New Year in different countries and completed all e-book exercises related to it. Then they shared traditional food recipes with their friends and even brought traditional Emirati food to class one day. They listened to dialogues and stories about food and special occasions around the world and competed comprehension check exercises. Gerund - infinitive was explained and practiced through e-books and apps. Vocabulary building was discussed this time through the dictionary entries. They enjoyed looking through thick dictionaries and searching for words. Students looked at different types of dictionary entries and made food charts in their vocabulary logs using those entries. Then they created images with sentences and added audio and video pieces to illustrate the words and shared with their peers. They brainstormed about special meals and celebrations in the UAE and drew idea maps on their iPads. They completed the maps with words about special meals and celebrations and explained their maps in writing. On Thursday students worked in groups and came up with *Popplet* presentations about important celebrations in their country.

iPad based tasks

iPad based tasks

This week students had to present their traditional celebrations in groups. They were given a choice of apps to do this. Most of them used the apps called Popplet, Puppet Puls and iMovie. They presented short videos and pictures of Emirati celebrations and talked us through the slides.	
Teacher's reflection This week students individually put their traditional food recipes on blogs, podcasts, and PhotoStories online. These digital products were viewed by their peers who wrote comments and got envolved in digital discussion. This was a cheerful practice for the class. They not only practiced their reading, writing and vocabulary by creating those digital discussions, but also got motivated using digital operations to create and share their work in minutes. I found it useful to pull up student screens on the main display to highlight strong and weak points of some text, or discuss the language used in specific audio or written piece. Every time I saw students had problems understanding a language aspect (ex. subject – verb agreement), I created activities from online resources on spot. It helped to address issues right away enabling me to work with my students' strengths and weaknesses and provide a more customized approach to overcome in-class unanticipated problems. I felt my students enjoyed their learning this week and were on task at all times.	***Teacher's reflection*** It was a tasty week. One of the moms cooked delicious traditional dish and sent to college. Everyone took pictures of it and later used them in their *Popplet* presentations. This week I noticed my students were growing up tech-savvy and mastering their collaborative working skills; they were easily searching for necessary information and figuring out how to use it for their advantage, selecting and sharing useful data, annotating and storing notes, helping each other with necessary language, apps and links, etc. In the beginning, for some of us it was difficult to operate and we wanted to give up. A student then insisted and suggested to explore the settings, options and consider doing a dry run with the peers to iron out the kinks. The week went really well and students did their best to work as hard as they could.

Ease of use

Interactiv e l-ing environm.

Motivation

iPad based tasks

Perceived satisfaction

iPad based tasks

Ease of use

Self-regulati on

Self-efficacy

Motivation

<table>
<tr><td colspan="2"><u>Week 4</u></td></tr>
<tr><td colspan="2">Unit 4: When do we eat special food?
(Q: Skills for Success _ Reading and writing)
Learning outcome: Describe the people, food, and activities at a celebration
Unit 4: How do you choose you food?
(Q: Skills for Success _ Listening and speaking)
Learning outcome: Develop and tell a story about a personal experience using information on what makes a good story</td></tr>
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Vocabulary: using the dictionary, prefixes and suffixes
Grammar: verbs + gerunds or infinitives
Writing: writing complete sentences
Listening: Listening for reasons
Pronunciation: Stressed syllables
Speaking: Giving opinions</td></tr>
<tr><td><u>Textbook group1</u>
This week students read, wrote, listened and talked about food, traditions, special occasions and celebrations. They looked at the big photo on the first page of the book and tried to guess its plot. Then through flashcards and book pictures they studied new words about food and did vocabulary check exercises in the text-books. They listened to dialogues and completed all listening exercises. They read the text entitled ‘Celebrating the New Year with Food’ and scanned for specific information. Next, they finished comprehension checks and moved to the grammar skill. They learned how to use gerunds and infinitives and discussed examples from the text. In groups they completed all grammar activities wrote about special meals and celebrations in the UAE and later used this information in their end of the week</td><td><u>Textbook group2</u>
The fourth week was all about traditional dishes, celebrations and holidays. Students’ participation in class was favourable. They actively completed both textbook exercises and extra worksheets. They mostly cheered up when a new interactive activity was introduced and run. Therefore, we practiced running dictations and picture dictations this week, which helped students practice their reading, writing, listening and speaking skills, as well as develop analytical and critical thinking skills. Students read the text about how people celebrate New Year in their countries and completed comprehension exercises. They underlined the new vocabulary in the reading text and wrote the new words in their vocabulary logs after we discussed and explained them. Then they used those words to write about famous celebrations in their country.</td></tr>
</table>

presentation projects about popular celebrations and traditional food.	Before writing they learned how to write idea maps and use it for writing. They actually did it very well. They managed to complete all listening activities in the book which involved listening for gist and for specific information. Transitions between skills and activities were planned and realized smoothly and students were mostly engaged in the tasks assigned to them. On Thursday students did pair presentations about their national celebrations and traditional food. They brought in pictures, antique family belongings and traditional food as visuals to support their presentations. In the end I asked students to say what they thought about their friends' poster presentations and voted for the best one. We then rewarded the best 3 presentations with applause.
Teacher's reflection The week went fairly smoothly. Students were actively engaged in discussions and group works and volunteered to express their ideas and opinions about family traditions, occasions and favourite food. The differentiated instruction and a friendly class atmosphere kept students engaged and on task. They still wanted individual one-on-one oral feedback in class but it was not time consuming. Students enjoyed the jigsaw puzzles that I prepared for them to practice vocabulary and grammar. When they finished this activity they asked me if I could prepare jigsaws for every class. Thursday's presentation project was another highlight of the week. They not only prepared speech and posters about traditional meals but also	***Teacher's reflection*** It was a week full of fun and food. Students' participation was quite satisfactory. We got traditional food in class almost every day. Extra communicative activities brought in some variety and kept away from sticking to the textbook which always drives the classroom atmosphere to a final fadeout. I was constantly needed for face-to-face feedback almost after every exercise, but I was equally able to work with individual students without losing sight of the entire class. Students participated constructively in all the implemented activities and volunteered to answer the questions and express themselves.

al T feedback

B is boring

had prepared and brought to class several small traditional dishes to use as visuals in their presentations and share with others after the class. Students received input and were given ample opportunities for output, which allowed them to practice the new language. These moments were important to build language without being preoccupied with grammar rules, but trying to convey meaning to communicate. To summarize, my students' active participation in various tasks and activities was probably the strongest element of the week, with the effective use of both textbooks ranking next.	Poster Presentation was of a success and cheered up the class. I think voting for the best presentations was a successful strategy of motivation since most students were able to formulate an evaluation of the presented work. Overall, this week was remarkably successful and enjoyable for my students.

S enjoy interactiv e tasks

S enjoy interactiv e tasks

Appendix E: Reflective Journals in phase 2

<table>
<tr><td colspan="2"><u>Week 1 – Phase 2</u></td></tr>
<tr><td colspan="2">Unit 5: How do you have fun?
(Q: Skills for Success _ Reading and writing)
Learning outcome: Explain what you do for fun and why you enjoy it.
Unit 5: What makes something fun?
(Q: Skills for Success _ Listening and speaking)
Learning outcome: Participate in a group discussion about fun places in your area.</td></tr>
<tr><td colspan="2">Reading: underlining and highlighting
Vocabulary: verb + noun collocations, collocations with do, play, and go
Grammar: subject and object pronouns
Writing: writing complete sentences
Listening: Listening for reasons
Pronunciation: reduced pronouns
Speaking: agreeing and disagreeing</td></tr>
<tr><td><u>iPad group 1</u></td><td><u>iPad group 2</u></td></tr>
<tr><td>It was a challenging week for the students. They received their iPads and started experimenting with them. Sunday’s classes were spent on installing the needed apps and e-textbooks, as well as on solving technical glitches with set-ups and email accounts. Students were slow in operating their tablets because it was a new experience for them. However, we managed to complete unit 5 in both e-books and couple of extra tasks. Students discussed in groups several ways of having fun, activities that need a lot of money vs activities can be done without spending a lot of money, etc. They read the newspaper article on page 70: Coming Events and highlighted the important information. They</td><td>This week was of a big change for my students and I can state of a positive change. Students were happy to get their iPads and be involved in hands on operations. Though the first two days we spend on adjusting technical hiccups but eventually managed to create a positive atmosphere and commence with teaching-learning.
This week students had a few mini discussions about fun activities in their country and around the world. They highlighted new words in the reading text called ‘Coming Events’ and added those words to their e-vocabulary logs. They discussed the meanings and use of those words and used them to create mini dialogues. Grammar skill created a bit of a confusio because students couldn’t see quite clearly how they could replace the pronoun with the noun. After</td></tr>
</table>

Tech issues

Tech issues

Self-efficacy

Interacti ve l-ing environ ment

Interactive l-ing environment

completed the comprehension check exercises and received immediate auto feedback. Grammar input was Subject and object pronouns. Students found sentences in the context where subjects and objects were nouns, pronouns replaced nouns and discussed how to use pronouns after they know the noun: *Kate likes the book. She thinks it is interesting*. Then they made a chart about how they have fun and shared with their peers. Their peers used annotation apps such as Adobe and NeuAnnotate to add and complete the list of fun activities they do. In the end they discussed the list and used it to complete the writing exercises on pages 74-75.	completing several activities with *Tense-Buster* app students mastered this grammar and successfully used it in writing sentences and making notes in the charts given on page 74. Then students listened to dialogues and conversations and completed multiple choice, true or false, and agree – disagree exercises.
Teacher's reflection It was a transition for this class from paper based to iPad based learning. Therefore, some of the students took quite long to adjust. I observed enthusiasm and motivation in class which I think was connected with new tablets and innovation. They were as if competing among themselves who could finish first and get the green auto ticks which would mean they made no mistakes. We used a variety of digital materials, including: the e-textbooks, annotation apps, Bblearn, audio player and recorder apps, as well as online educational short videos which	***Teacher's reflection*** The week was busy and at the same time very productive. My students were happy to be given a chance to study with iPads. Though students had to set up the iPads, update the programs, create apple ids and passwords, open emails, download college apps and e-books, they did their best to cooperate and patiently wait for their turn. I felt through the use of iPads students became more fascinated with their learning. Judging from their active participation in class, one could say that there was evidence of a constructive student-student, iPad-student, as well as teacher-student rapport. There were also negative reactions this week: a student was really upset when she accidentally deleted her work that she spend considerable time to create. I tried to bring it back but was not successful. Another case was with paid apps, and some students

Self-efficacy

Interactive l-ing environment

iPad based tasks

were used to reinforce the learning acquired through previous activities and to tune with the lesson objectives. I asked individual questions and made sure that all students participated. Classroom interaction, interactive materials and introduction of skills in the appropriate sequence, effective time management, as well as final presentation projects done perfectly well constituted an evidence of success for this first week.	didn't have credit cards to purchase those apps and had to use the free ones which didn't have all the functions. They were not happy at all about this. They will try to get those apps next week, but we had to go through this experience. Overall, it was an innovative week with its ups and downs. We took on this challenging week together and my students were able to show me their learning through their active participation and e-tasks they did in class. I have a feeling it's going to be a fun learning for this group. I look forward to observing the journey unfold from this first week.

Interactive l-ing environment

L-ing effectiveness

Week 2- Phase 2	
Unit 6: What is your favourite room? (Q: Skills for Success _ Reading and writing) **Learning outcome**: *Write a paragraph describing your favourite room using prepositions.* ***Unit 6: What makes a good home?*** (Q: Skills for Success _ Listening and speaking) **Learning outcome**: *Describe your perfect home and present your design to the class.*	
***Reading**: underlining and highlighting* ***Vocabulary**: word categories, compound nouns* ***Grammar**: prepositions of location* ***Writing**: writing paragraphs* ***Listening**: Listening for opinions* ***Pronunciation**: stress in compound nouns* ***Speaking**: agreeing and disagreeing*	
iPad group 1	***iPad group 2***
Students described their rooms and houses this week. They read and listened to two texts called	This week we concentrated on houses and rooms. Students liked looking at different e-room designs

Self-regulation

Motivation

There is no place like home and *A tall man in a small space*. They scanned the readings and answered questions about them. They completed true and false exercises, circled correct answers and completed statements about the reading. Then they worked on vocabulary by highlighting unknown words in the text and practicing them through e-book exercises and *Spelling city* app. Students used the *neuAnnotate* app and created the plan of Sauer's apartment from the second reading passage. Then they shared the plan, compared and did peer correction. Students looked at a messy room picture and used prepositions of location to speak about it. Then they used the *Pages* app and wrote a paragraph about their favourite room. They quickly drew the map of the room and labeled objects on their map. They shared their paragraphs when they finished and we read all together and did peer correction. On Thursday students had to create an iMovie project about their dream house, using multimedia. They had to annotate the pictures and videos using prepositions of location and record their voice as they spoke about their dream house. It was a group project and was done with a big success and enthusiasm.	and discussing them. They read about the smallest house where a very tall man lived and discussed the interior design of that house. They designed their own houses on their iPads and presented to class in couple of minutes. Students learned the unit vocabulary and practiced the words through discussions, written exercises and reading texts. They learned all about paragraph writing. Once they understood the concept, they wanted to see how it was applied. So, they practiced writing a paragraph about their favourite room and added pictures and labels where necessary. Then through mirroring students shared their paragraphs with others and voted for the best. They listened to several conversations and decided on good and bad points about housing, checked correct answers and ranked the ideas and gave explanations. The end of the week project was an iMovie project called 'My Dream House.' Students worked in pairs and created a 3 minute project about how they see their future house.

Self-efficacy

Ease of use

iPad based tasks

Interactive l-ing environment

Teacher's reflection	***Teacher's reflection***
This second week was a successful week full of discussions and group work. Students were keen in using their iPads for creating, completing and presenting the assigned activities. They loved the idea of experimenting, competing and sharing with their peers. The healthy noise and buzz as they worked was mostly there this week. At first I thought the iMovie project might be tough for the students as it was the first time experience, but they didn't see it that way. Instead they worked in groups, shared the timed work, found suitable programs, pictures and videos, explained through chunks and sentences. They actually cooperated and came up with beautiful movies. The challenge brought value to what was presented. Throughout the week my students took advantage of the vast opportunities that were available to them as learners which naturally made their learning authentic. Students not only learned and practiced the language but also developed such skills as critical thinking, problem solving, analytical reasoning, sharing and cooperating.	There is no doubt that the interactive learning in general and iPad based delivery in particular, brought the language achievement and motivation of this group to a whole new level. It resulted in a more prompt work from both my and student perspective. From my perspective I can assure that it resulted in quicker recognition of missing or incomplete work. could be sure that my students received and turned i their assignments on time. It overcame the absent or late student problems and created stronger partnership between home and college because of the transparency and easy access to assigned and submitted tasks. From student perspective it resulted in instant feedback, variety of ways to accommodate different learning styles, developing self-confidence when given a chance to redo the same task for many times until they are successful and be praised for it, developing cooperative and communicative skills, etc. This week I was pleased to see how my students progressed in operating iPads for language learning and how enthusiastically they handled and completed all language learning task.

Motivation

Perceived satisfaction

Motivation

Self-efficacy

Interactive l-ing environment

iPad based tasks

Perceived usefulness

iPad based tasks

Perceived satisfaction

Perceived usefulness

L-ing effectiveness

Week 3- Phase 2

Unit 7: Where is the best and the worst weather?

(Q: Skills for Success _ Reading and writing)

Learning outcome: *Write a paragraph describing types of weather in answer to a question prompt.*

Unit 6: What makes a good home?

(Q: Skills for Success _ Listening and speaking)

Learning outcome: *Participate in group discussion about the weather.*

***Reading**: Identifying pronoun references*

***Vocabulary**: using the dictionary: synonyms, nouns and adjectives for weather*

***Grammar**: adverbs of frequency*

***Writing**: writing paragraphs*

***Listening**: Listening for opinions*

***Pronunciation**: stressing important words*

***Speaking**: asking for repetition*

iPad group 1	***iPad group 2***
We started the unit with a short video about the weather and had a discussion about it. Then in pairs students compared the weather in the video with the weather in their country. Then they read the two e-textbook texts *Good Weather, Bad Weather* on page 97 and *Storm Chasers* on page 103. They highlighted the unknown words, guessed the meaning and completed the vocabulary building exercises and added them to their vocabulary logs. They scanned the texts for specific information and completed the comprehension check exercises. They also read some passages about seasons and weather in *Reading extra* and *Scribd* apps and developed their reading skills by scanning and skimming the paragraphs. They did matching, true and false	The unit was about weather and four seasons, so everything the students did this week was about the weather. They watched the video in the e-book and compared stormy weather with sunny weather they mostly have in their country. They guessed how the snowy weather would look like and expressed willingness to experience it one day. They read about good and bad weather on page 97 and did true - false and matching exercises to for comprehension check. The students read about Storm Chasers on page 103 and wrote correct paragraph numbers next to each detail. They learned how to use adverbs of frequency and practiced grammar through e-textbook exercises and *Tense Buster, Grammar Up,* and *Grammar Express* apps. Students completed all listening and

Interactive l-ing environment

iPad based tasks

iPad based tasks

Self-regulation

questions and arranging-sorting exercises. Grammar input was about the adverbs of frequency. They listened to monologues, dialogues and conversations about seasons and weather and did the listening and speaking exercises. End of the week project was to write a weather forecast and create multimedia that would look real and report it to the audience.	speaking exercises and got involved in mini discussions about weather. On Thursday they prepared weather forecast in pairs and reported to class with great success. Interactive l-ing environment
Teacher's reflection This week students took control of their learning. They used online dictionaries, vocabulary and grammar apps to practice, and voice recorders to record themselves for the project. Students were eager to embrace iPads and were able to troubleshoot technical issues and resolve them as quick as possible. They created a social reading experience through *Bblearn* group discussion, which allowed them to connect with students reading the same text, ask questions, make comments, read their peers' comments, express opinions and provide an interactive experience. They really liked this experience and I noticed that even the shy students took active participation in this digital discussion. Another highlight of the week was the weather forecast project. It was so interesting to see them	***Teacher's reflection*** Never before has it been this easy and fast to put together and share content with each oter. Because my students had never seen snow and rarely had they seen foggy and stormy weather, they had to search online for videos about these types of weather and share with each other. I have to note that finding and sharing took them seconds and they were all ready and on task. We successfully covered the unit and smoothly moved forward to extra fun activities and group discussions. Self-regulation The final project boosted the enthusiasm even more. Students cooperatively managed to come up with weather forecast and in pairs reported it to class. They prepared multimedia to go with it and even dressed smart to look effective. I am happy to say iPad based tasks

spare neither effort nor pain to find necessary apps to make this project look real and accurate. It was a pair work where two reporters had to speak about the weather and use visuals to support their speech. I can proudly state that my students did a great job. Their language was accurate and fluent, and they were well prepared. They used multimedia and necessary applications to make their 3 minute projects appealing.	that it was a real success.

L-ing effectiveness

Interactive l-ing environment

Motivation

L-ing effectiveness

Week 4- Phase 2	
Unit 8: How can you change an unhealthy habit? (Q: Skills for Success _ Reading and writing) **Learning outcome**: *Write a paragraph about how to change a bad habit.* ***Unit 6: What do you do to stay healthy?*** (Q: Skills for Success _ Listening and speaking) **Learning outcome**: *Create, conduct, and discuss a health survey.*	
***Reading**: Identifying pronoun references* ***Vocabulary**: collocations, adjectives ending in –ed* ***Grammar**: modal verbs – can, could, and should* ***Writing**: supporting your ideas* ***Listening**: Listening for frequency* ***Pronunciation**: can, can't, should, and shouldn't* ***Speaking**: asking for repetition*	
iPad group 1	***iPad group 2***
This week students watched short videos and discussed healthy and unhealthy habits. They read about *Stages of change, goals and lifestyles*. They practiced collocations and new words by using them in context and speaking about their	Habits and lifestyles appeared to be hot topics for the students to talk about and debate on. They switched to Arabic every time they couldn't make each other understand their point and it was amazing to see engaged they were in discussions.

Motivation

lifestyles. Students used the new vocabulary in a role play which they acted out within scenario. They videotaped the role play as they acted and then discussed the weak and strong points of it. Students also read the text called *Dr. Lee on Wealth* on page 120 and did comprehension check exercises. Modal verbs caused a bit of confusion. They could not understand why they couldn't use *to* with modals. They also had difficulty with differentiating could and should. They listened to short conversations and talks and completed charts, sentences and dialogues with modal verbs. Then they acted out those dialogues and recorded their voice to be able to listen to their pronunciation. On Thursday students had review class and took their second progress test.	Students watched the unit video and read both texts about good and bad habits in the e-book. They underlined the new words and collocations and practiced them in interactive vocabulary building exercises. They created situations and acted out dialogues where good and bad habits were discussed. Then they brainstormed and wrote paragraphs describing their lifestyles and habits. Students listened to conversations and completed all listening exercises in the e-book.
Teacher's reflection I felt the use of iPads in language classes has greatly encouraged confidence and risk taking among my students. Tools such as audio and video recorders helped a lot this week in preparing, acting and recording role plays and dialogues, which later served as a valuable method to go through strong and weak parts of student speech patterns and give feedback relying on specific examples. The endless access to	***Teacher's reflection*** In my opinion this group has come a long way and will continue to impress us for long. I will not think twice to say that those students can professionally deal with most iPad based tasks and feel quite comfortable and happy using this means for their language learning.

iPad based tasks

Self-regulation

iPad based tasks

Interactive l-ing environment

Self-efficacy

Self-efficacy

Perceived usefulness

L-ing effectiveness

valuable tools and authentic information such as dictionaries, online videos, pictures, sketches, audio effects, etc. made students' learning meaningful, interesting, easy and quick to achieve.	. They hardly ever deviated from the tasks and tried to accomplish assignments as accurately and promptly as they could. The most interesting part in this was that they mostly rushed to help each other in case of a technical problem. This, in its turn, opened up a chance of communicating language problems as they arose. However, language problems were mechanically directed to me as a teacher. So, I think if we could somehow find ways of encouraging students to help each other with language as much as they do with the technology, we would be able to double up the language achievement effectiveness.

Self-regulation

iPad based tasks

Interactive l-ing environment

Appendix F: The Survey Questionnaire in English

Dear students,

Below are 29 statements regarding your attitudes to studying English using iPads. Please read each statement and indicate to what extent you agree or disagree with each one. Your responses will remain confidential.

iPads are easy to carry	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
iPads are active language learning tools	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
iPad apps for language learning are not easy to regulate	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I am confident using my iPad in class	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I am not confident using my iPad for the test	1. Completely disagree 2. Mostly disagree

	3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I am confident using my iPad for electronic resources	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I believe the iPad can develop communication between the students	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I believe the iPad can develop communication between the students and the teacher	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I believe the iPad can be a means of information gaining	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I believe the iPad can be a means of information sharing	1. Completely disagree 2. Mostly disagree 3. Slightly disagree

	4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I believe the iPad can be a means of language learning	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
It is easy to write on the iPad	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
It is easy to listen on the iPad	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree **7.** Completely agree
iPad based tasks provide language learning	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
iPad based tasks are interesting to do	1. Completely disagree 2. Mostly disagree

	3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
iPad based tasks are difficult to share	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I am satisfied with the availability of iPad language learning applications	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I am satisfied with the electronic format of the language learning applications	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I am not satisfied with the iPad based assessment applications	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I believe language learning through iPads is productive	1. Completely disagree 2. Mostly disagree

	3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I believe acquiring language learning skills through iPads is productive	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I believe acquiring literacy skills through iPads is not productive	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I don't enjoy using iPad for my language class	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I plan to continue learning English through my iPad	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I encourage others to start using iPad for language learning	1. Completely disagree 2. Mostly disagree

	3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I feel iPads could enhance language learning effectiveness	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I feel iPads could motivate learners into language learning	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree
I feel iPads could not provide interactive ways to develop language skills	1. Completely disagree 2. Mostly disagree 3. Slightly disagree 4. Neither agree nor disagree 5. Slightly agree 6. Mostly agree 7. Completely agree

Appendix G: Descriptive Statistics

Descriptive statistics for Pre-test marks.

(A) Group 1:

iPad G 1 - Used iPads

Statistics

	Pre-test1	Post-test1- Phase I
N (Number of students)	20	20
Mean	61.45	77.90
Median	61.00	79.00
Std. Deviation	2.235	4.291

(B) Textbook group 1- Used books

Statistics

	Pre-test1	Post-test1- Phase I
N (Number of students)	20	20
Mean	61.55	73.45
Median	61.50	74.00
Std. Deviation	2.282	3.832

Descriptive statistics for Post-test marks.

Group number		Statistic
Cont. G 1 - Used iPads	Mean	77.90
	Median	79.00
	Std. Deviation	4.291
	Minimum	69
	Maximum	84
Cont. G 2 - Used iPads	Mean	78.90
	Median	80.50
	Std. Deviation	3.796
	Minimum	71
	Maximum	84

Exp. G 1 - Used books only	Mean	73.45
	Median	74.00
	Std. Deviation	3.832
	Minimum	65
	Maximum	79
Exp. G 2 - Used books only	Mean	73.45
	Median	73.00
	Std. Deviation	3.486
	Minimum	68
	Maximum	80

Descriptive statistics for Progress test- Cycle 1- marks.

Group number		Statistic
Cont. G 1 - Used iPads	Mean	73.75
	Median	73.50
	Std. Deviation	3.007
	Minimum	68
	Maximum	78
Cont. G 2 - Used iPads	Mean	73.35
	Median	73.50
	Std. Deviation	2.961
	Minimum	68
	Maximum	79
Exp. G 1 - Used books only	Mean	71.30
	Median	72.00
	Std. Deviation	2.055
	Minimum	67
	Maximum	76
Exp. G 2 - Used books only	Mean	72.30
	Median	72.00
	Std. Deviation	2.342
	Minimum	68
	Maximum	77

Descriptive statistics for Progress test 2- cycle 2- marks

Cont. G 1 - Used iPads	Mean	83.50
	Median	83.50
	Std. Deviation	2.800
	Minimum	79
	Maximum	89
Cont. G 2 - Used iPads	Mean	84.15
	Median	84.00
	Std. Deviation	3.281
	Minimum	79
	Maximum	90
Exp. G 1 - Used books only	Mean	77.95
	Median	78.00
	Std. Deviation	2.114
	Minimum	74
	Maximum	82
Exp. G 2 - Used books only	Mean	78.60
	Median	79.00
	Std. Deviation	1.957
	Minimum	75
	Maximum	81

Descriptive statistics for Posttest 1- For all groups

Group number		Statistic
Cont. G 1 - Used iPads	Mean	77.90
	Median	79.00
	Std. Deviation	4.291
	Minimum	69
	Maximum	84
Cont. G 2 - Used iPads	Mean	78.90
	Median	80.50
	Std. Deviation	3.796
	Minimum	71
	Maximum	84
Exp. G 1 - Used books only	Mean	73.45
	Median	74.00
	Std. Deviation	3.832
	Minimum	65
	Maximum	79
Exp. G 2 - Used books only	Mean	73.45
	Median	73.00
	Std. Deviation	3.486
	Minimum	68
	Maximum	80

Descriptive statistics for Post-test 2- Cycle 2

Group number		Statistic
Exp. G 1 - Used books only	Mean	87.90
	Median	88.00
	Std. Deviation	2.673
	Minimum	82
	Maximum	91
Exp. G 2 - Used books only	Mean	87.30
	Median	87.50
	Std. Deviation	2.849
	Minimum	81
	Maximum	92

Descriptive statistics for Progress test 1- Cycle 2

Exp. G 1 - Used books only	Mean	72.95
	Median	73.00
	Std. Deviation	2.800
	Minimum	68
	Maximum	77
Exp. G 2 - Used books only	Mean	72.95
	Median	72.50
	Std. Deviation	2.481
	Minimum	68
	Maximum	77

Descriptive statistics for Progress test 2- Cycle 2

Exp. G 1 - Used books only	Mean	86.45
	Median	88.00
	Std. Deviation	4.199
	Minimum	77
	Maximum	92
Exp. G 2 - Used books only	Mean	86.10
	Median	87.00
	Std. Deviation	3.553
	Minimum	78

	Maximum	90

Descriptive statistics for Pretest2- Cycle 2

Exp. G 1 - Used books only	Mean	72.70
	Median	72.50
	Std. Deviation	2.697
	Minimum	68
	Maximum	77
Exp. G 2 - Used books only	Mean	72.50
	Median	72.50
	Std. Deviation	2.565
	Minimum	68
	Maximum	80

Appendix H: Experimental Data Analysis

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	80	100.0
	Excluded[a]	0	.0
	Total	80	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.249	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Quest 1 iPads are easy to carry	13.00	.481	.232	-.041[a]
Quest 2 iPads are active language learning tools	12.89	.607	.122	.210
Quest 3 iPad apps for language learning are easy to regulate	13.46	.480	.069	.367

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	80	100.0
	Excluded[a]	0	.0
	Total	80	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.190	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Quest 1 iPads are easy to carry	31.34	1.771	.157	.106
Quest 2 iPads are active language learning tools	31.22	1.949	.062	.176
Quest 3 iPad apps for language learning are easy to regulate	31.80	1.985	-.073	.292
Quest 12 It is easy to read on the iPad	32.04	1.631	.181	.070
Quest 13 It is easy to write on the iPad	32.43	1.463	.153	.079
Quest 14 It is easy to listen on the iPad	31.24	1.804	.020	.218

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test1	61.50	40	2.230	.353
	Post-test1	75.68	40	4.604	.728

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre-test1 & Post-test1	40	.683	.000

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower				
Pair 1	Pre-test1 - Post-test1	-14.175	3.485	.551	-15.290				

Paired Samples Test

		Paired Differences				
		95% Confidence Interval of the Difference				
		Upper	t	df	Sig. (2-tailed)	
Pair 1	Pre-test1 - Post-test1	-13.060	-25.722	39	.000	

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test1	61.45	20	2.235	.500
	Post-test1	77.90	20	4.291	.959

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre-test1 & Post-test1	20	.784	.000

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower				
Pair 1	Pre-test1 - Post-test1	-16.450	2.892	.647	-17.804				

Paired Samples Test

		Paired Differences				
		95% Confidence Interval of the Difference				
		Upper	t	df	Sig. (2-tailed)	
Pair 1	Pre-test1 - Post-test1	-15.096	-25.435	19	.000	

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test1	61.55	20	2.282	.510
	Post-test1	73.45	20	3.832	.857

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre-test1 & Post-test1	20	.813	.000

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower				
Pair 1	Pre-test1 - Post-test1	-11.900	2.382	.533	-13.015				

Paired Samples Test

		Paired Differences				
		95% Confidence Interval of the Difference				
		Upper	t	df	Sig. (2-tailed)	
Pair 1	Pre-test1 - Post-test1	-10.785	-22.342	19	.000	

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Prg test1- For all groups	72.30	20	2.342	.524
	Prg test2.1- Cycle 2	72.95	20	2.481	.555
Pair 2	Prg test2 - For all groups	78.60	20	1.957	.438
	Prg test2.2- Cycle 2	86.10	20	3.553	.794

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Prg test1- & Prg test2.1- Cycle 2	20	.845	.000
Pair 2	Prg test2 - & Prg test2.2- Cycle 2	20	.589	.006

Paired Samples Test- Group 4

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Prg test1- Prg test2.1- Cycle 2	-.650	1.348	.302	-1.281	-.019	-2.156	19	.044
Pair 2	Prg test2 - Prg test2.2- Cycle 2	-7.500	2.875	.643	-8.845	-6.155	-11.668	19	.000

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Prg test1- For all groups	71.30	20	2.055	.459
	Prg test2.1- Cycle 2	72.95	20	2.800	.626
Pair 2	Prg test2 - For all groups	77.95	20	2.114	.473
	Prg test2.2- Cycle 2	86.45	20	4.199	.939

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Prg test1- & Prg test2.1- Cycle 2	20	.085	.721
Pair 2	Prg test2 -& Prg test2.2- Cycle 2	20	.098	.683

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post-test1- For all groups- Phase I	73.45	20	3.832	.857
	Post-test2 - Cycle 2- For 2 groups - Exp -1 and Exp-2	87.90	20	2.673	.598

Paired Samples Correlations – Group 3

		N	Correlation	Sig.
Pair 1	Post-test1-Phase I & Post-test2 - Cycle 2-	20	.508	.022

Paired Samples Test – Group 3

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post-test1- Phase I - Post-test2 – Phase 2-	-14.450	3.379	.756	-16.031	-12.869	-19.124	19	.000

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post-test1- For all groups- Phase I	73.45	20	3.832	.857
	Post-test2 - Cycle 2- For 2 groups - Exp -1 and Exp-2	87.90	20	2.673	.598

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Post-test1- For all groups- Phase I & Post-test2 - Cycle 2- For 2 groups - Exp -1 and Exp-2	20	.508	.022

Paired Samples Statistics- Group 3

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post-test1-Phase I	73.45	20	3.832	.857
	Post-test2 - Cycle 2	87.90	20	2.673	.598

Paired Samples Test- Group 3

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Post-test1- Phase I - Post-test2 - Cycle 2	-14.450	3.379	.756	-16.031	-12.869	-19.124	19	.000

Paired Samples Statistics- Group 3

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post-test1- For all groups- Phase I	73.45	20	3.486	.780
	Post-test2 - Cycle 2- For 2 groups - Exp -1 and Exp-2	87.30	20	2.849	.637

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post-test1- Phase I - Post-test2 - Cycle 2	-13.850	3.911	.874	-15.680	-12.020	-15.839	19	.000

Oneway

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Cont. G 1	20	77.90	4.291	.959	75.89	79.91
Cont. G 2	20	78.90	3.796	.849	77.12	80.68
Exp. G 1	20	73.45	3.832	.857	71.66	75.24
Exp. G 2	20	73.45	3.486	.780	71.82	75.08
Total	80	75.93	4.547	.508	74.91	76.94

Descriptives

Post-test1

	Minimum	Maximum
Cont. G 1	69	84
Cont. G 2	71	84
Exp. G 1	65	79
Exp. G 2	68	80
Total	65	84

Test of Homogeneity of Variances

Post-test1

Levene Statistic	df1	df2	Sig.
.375	3	76	.771

ANOVA

Post-test1

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	500.050	3	166.683	11.176	.000
Within Groups	1133.500	76	14.914		
Total	1633.550	79			

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Post-test1

	(I) Group number	(J) Group number	Mean Difference (I-J)	Std. Error	Sig.		
LSD	Cont. G 1	Cont. G 2	-1.000	1.221	.415		
		Exp. G 1	4.450*	1.221	.000		
		Exp. G 2	4.450*	1.221	.000		
	Cont. G 2	Cont. G 1	1.000	1.221	.415		
		Exp. G 1	5.450*	1.221	.000		
		Exp. G 2	5.450*	1.221	.000		
	Exp. G 1	Cont. G 1	-4.450*	1.221	.000		
		Cont. G 2	-5.450*	1.221	.000		

		Exp. G 2	.000	1.221	1.000		
	Exp. G 2	Cont. G 1	-4.450*	1.221	.000		
		Cont. G 2	-5.450*	1.221	.000		
		Exp. G 1	.000	1.221	1.000		
Tamhane	Cont. G 1	Cont. G 2	-1.000	1.281	.969		
		Exp. G 1	4.450*	1.286	.008		
		Exp. G 2	4.450*	1.236	.006		
	Cont. G 2	Cont. G 1	1.000	1.281	.969		
		Exp. G 1	5.450*	1.206	.000		
		Exp. G 2	5.450*	1.153	.000		
	Exp. G 1	Cont. G 1	-4.450*	1.286	.008		
		Cont. G 2	-5.450*	1.206	.000		
		Exp. G 2	.000	1.158	1.000		
	Exp. G 2	Cont. G 1	-4.450*	1.236	.006		
		Cont. G 2	-5.450*	1.153	.000		
		Exp. G 1	.000	1.158	1.000		

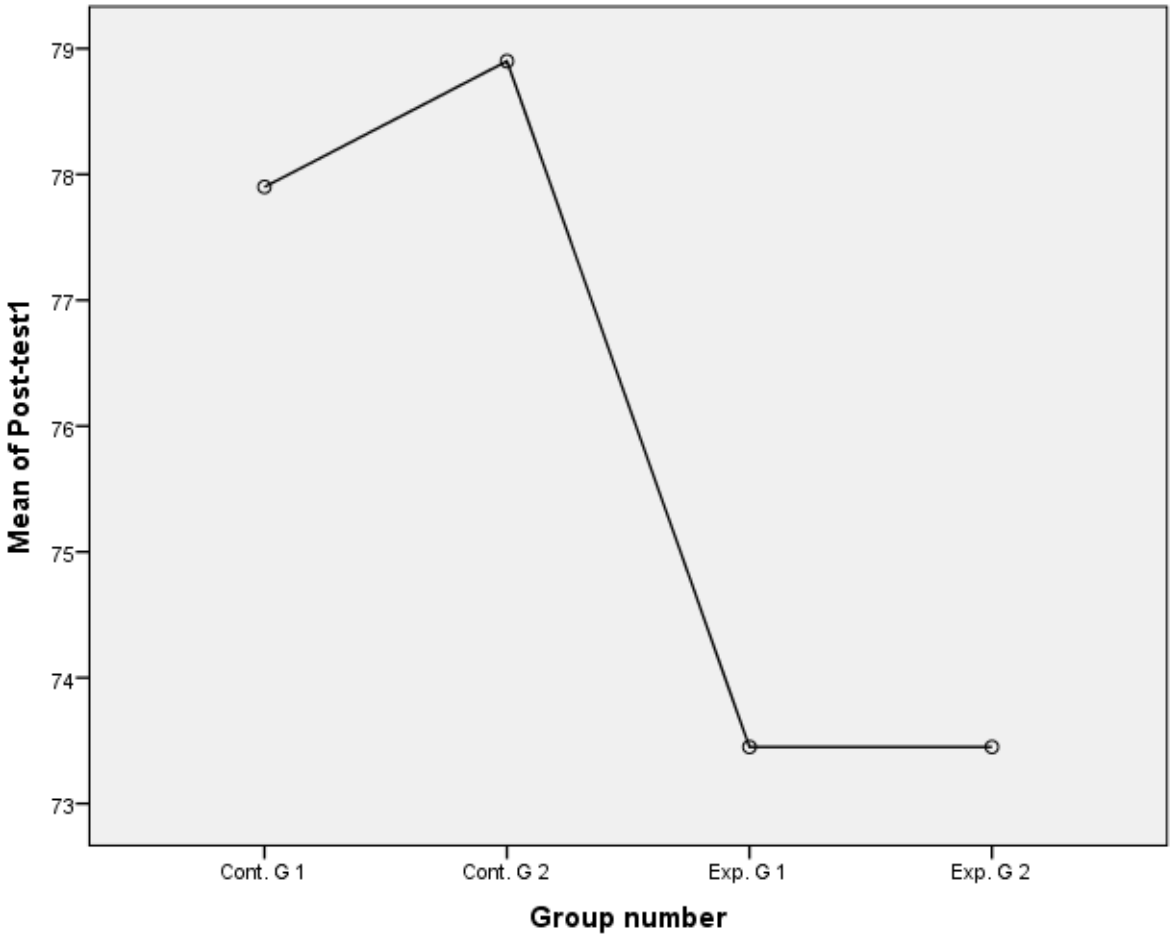
Multiple Comparisons

Dependent Variable: Post-test1

			95% Confidence Interval	
	(I) Group number	(J) Group number	Lower Bound	Upper Bound
LSD	Cont. G 1	Cont. G 2	-3.43	1.43
		Exp. G 1	2.02	6.88
		Exp. G 2	2.02	6.88
	Cont. G 2	Cont. G 1	-1.43	3.43

		Exp. G 1	3.02	7.88
		Exp. G 2	3.02	7.88
	Exp. G 1	Cont. G 1	-6.88	-2.02
		Cont. G 2	-7.88	-3.02
		Exp. G 2	-2.43	2.43
	Exp. G 2	Cont. G 1	-6.88	-2.02
		Cont. G 2	-7.88	-3.02
		Exp. G 1	-2.43	2.43
Tamhane	Cont. G 1	Cont. G 2	-4.56	2.56
		Exp. G 1	.88	8.02
		Exp. G 2	1.01	7.89
	Cont. G 2	Cont. G 1	-2.56	4.56
		Exp. G 1	2.10	8.80
		Exp. G 2	2.25	8.65
	Exp. G 1	Cont. G 1	-8.02	-.88
		Cont. G 2	-8.80	-2.10
		Exp. G 2	-3.22	3.22
	Exp. G 2	Cont. G 1	-7.89	-1.01
		Cont. G 2	-8.65	-2.25
		Exp. G 1	-3.22	3.22

Means Plots



Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Prg test1- For all groups	72.68	80	2.746	.307
	Prg test2 - For all groups	81.05	80	3.792	.424

		N	Correlation
Pair 1	Prg test1- For all groups & Prg test2 - For all groups	80	.746

		Paired Differences			
					95% Confidence Interval of the Difference
		Mean	Std. Deviation	Std. Error Mean	Lower
Pair 1	Prg test1- For all groups - Prg test2 - For all groups	-8.375	2.528	.283	-8.938

Paired Samples Test

		Paired Differences			
		95% Confidence Interval of the Difference			
		Upper	t	df	Sig. (2-tailed)
Pair 1	Prg test1- For all groups - Prg test2 - For all groups	-7.812	-29.635	79	.000

Group Statistics

	Group number	N	Mean	Std. Deviation	
Prg test1- For all groups	Cont. G 1 - Used iPads	20	73.75	3.007	
	Cont. G 2 - Used iPads	20	73.35	2.961	
Prg test2 - For all groups	Cont. G 1 - Used iPads	20	83.50	2.800	
	Cont. G 2 - Used iPads	20	84.15	3.281	

Group Statistics

	Group number	Std. Error Mean
Prg test1- For all groups	Cont. G 1 - Used iPads	.672
	Cont. G 2 - Used iPads	.662
Prg test2 - For all groups	Cont. G 1 - Used iPads	.626
	Cont. G 2 - Used iPads	.734

		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	t
Prg test1- For all groups	Equal variances assumed	.043	.837	.424
	Equal variances not assumed			.424
Prg test2 - For all groups	Equal variances assumed	.479	.493	-.674
	Equal variances not assumed			-.674

		t-test for Equality of Means		
		df	Sig. (2-tailed)	Mean Difference
Prg test1- For all groups	Equal variances assumed	38	.674	.400
	Equal variances not assumed	37.991	.674	.400
Prg test2 - For all groups	Equal variances assumed	38	.504	-.650
	Equal variances not assumed	37.084	.505	-.650

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	
Prg test1- For all groups	Equal variances assumed	.944	-1.510	
	Equal variances not assumed	.944	-1.510	
Prg test2 - For all groups	Equal variances assumed	.965	-2.603	
	Equal variances not assumed	.965	-2.604	

Independent Samples Test

		t-test for Equality of Means
		95% Confidence Interval of the Difference
		Upper
Prg test1- For all groups	Equal variances assumed	2.310
	Equal variances not assumed	2.310
Prg test2 - For all groups	Equal variances assumed	1.303
	Equal variances not assumed	1.304

Group Statistics

	Group number	N	Mean	Std. Deviation	
Prg test1- For all groups	Cont. G 1 - Used iPads	20	73.75	3.007	
	Exp. G 1 - Used books only	20	71.30	2.055	
Prg test2 - For all groups	Cont. G 1 - Used iPads	20	83.50	2.800	
	Exp. G 1 - Used books only	20	77.95	2.114	

Group Statistics

	Group number	Std. Error Mean
Prg test1- For all groups	Cont. G 1 - Used iPads	.672
	Exp. G 1 - Used books only	.459
Prg test2 - For all groups	Cont. G 1 - Used iPads	.626
	Exp. G 1 - Used books only	.473

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t						
Prg test1- For all groups	Equal variances assumed	5.205	.028	3.009						
	Equal variances not assumed			3.009						
Prg test2 - For all groups	Equal variances assumed	2.107	.155	7.073						
	Equal variances not assumed			7.073						

Independent Samples Test

		t-test for Equality of Means					
		df	Sig. (2-tailed)	Mean Difference			
Prg test1- For all groups	Equal variances assumed	38	.005	2.450			
	Equal variances not assumed	33.568	.005	2.450			

Prg test2 - For all groups	Equal variances assumed	38	.000	5.550			
	Equal variances not assumed	35.350	.000	5.550			

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	
Prg test1- For all groups	Equal variances assumed	.814	.802	
	Equal variances not assumed	.814	.794	
Prg test2 - For all groups	Equal variances assumed	.785	3.962	
	Equal variances not assumed	.785	3.958	

Independent Samples Test

		t-test for Equality of Means
		95% Confidence Interval of the Difference
		Upper
Prg test1- For all groups	Equal variances assumed	4.098
	Equal variances not assumed	4.106
Prg test2 - For all groups	Equal variances assumed	7.138
	Equal variances not assumed	7.142

Group Statistics

	Group number	N	Mean	Std. Deviation	
Prg test1- For all groups	Cont. G 2 - Used iPads	20	73.35	2.961	
	Exp. G 2 - Used books only	20	72.30	2.342	
Prg test2 - For all groups	Cont. G 2 - Used iPads	20	84.15	3.281	
	Exp. G 2 - Used books only	20	78.60	1.957	

Group Statistics

	Group number	Std. Error Mean
Prg test1- For all groups	Cont. G 2 - Used iPads	.662
	Exp. G 2 - Used books only	.524
Prg test2 - For all groups	Cont. G 2 - Used iPads	.734
	Exp. G 2 - Used books only	.438

		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	t
Prg test1- For all groups	Equal variances assumed	1.745	.194	1.244
	Equal variances not assumed			1.244
Prg test2 - For all groups	Equal variances assumed	4.898	.033	6.496
	Equal variances not assumed			6.496

Independent Samples Test

		t-test for Equality of Means					
		df	Sig. (2-tailed)	Mean Difference			
Prg test1- For all groups	Equal variances assumed	38	.221	1.050			
	Equal variances not assumed	36.086	.222	1.050			
Prg test2 - For all groups	Equal variances assumed	38	.000	5.550			
	Equal variances not assumed	31.004	.000	5.550			

		t-test for Equality of Means	
		Std. Error Difference	95% Confidence Interval of the Difference: Lower
Prg test1- For all groups	Equal variances assumed	.844	-.659
	Equal variances not assumed	.844	-.662
Prg test2 - For all groups	Equal variances assumed	.854	3.821
	Equal variances not assumed	.854	3.808

Independent Samples Test

		t-test for Equality of Means
		95% Confidence Interval of the Difference: Upper
Prg test1- For all groups	Equal variances assumed	2.759
	Equal variances not assumed	2.762
Prg test2 - For all groups	Equal variances assumed	7.279
	Equal variances not assumed	7.292

	Group number	N	Mean	Std. Deviation
Prg test1- For all groups	Exp. G 1 - Used books only	20	71.30	2.055
	Exp. G 2 - Used books only	20	72.30	2.342
Prg test2 - For all groups	Exp. G 1 - Used books only	20	77.95	2.114
	Exp. G 2 - Used books only	20	78.60	1.957

Group Statistics

	Group number	Std. Error Mean
Prg test1- For all groups	Exp. G 1 - Used books only	.459
	Exp. G 2 - Used books only	.524
Prg test2 - For all groups	Exp. G 1 - Used books only	.473
	Exp. G 2 - Used books only	.438

		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	t
Prg test1- For all groups	Equal variances assumed	.457	.503	-1.436
	Equal variances not assumed			-1.436
Prg test2 - For all groups	Equal variances assumed	.005	.945	-1.009
	Equal variances not assumed			-1.009

		t-test for Equality of Means		
		df	Sig. (2-tailed)	Mean Difference
Prg test1- For all groups	Equal variances assumed	38	.159	-1.000
	Equal variances not assumed	37.367	.159	-1.000
Prg test2 - For all groups	Equal variances assumed	38	.319	-.650
	Equal variances not assumed	37.776	.319	-.650

		t-test for Equality of Means	
		Std. Error Difference	95% Confidence Interval of the Difference
			Lower
Prg test1- For all groups	Equal variances assumed	.697	-2.410
	Equal variances not assumed	.697	-2.411
Prg test2 - For all groups	Equal variances assumed	.644	-1.954
	Equal variances not assumed	.644	-1.955

Independent Samples Test

		t-test for Equality of Means
		95% Confidence Interval of the Difference
		Upper
Prg test1- For all groups	Equal variances assumed	.410
	Equal variances not assumed	.411
Prg test2 - For all groups	Equal variances assumed	.654
	Equal variances not assumed	.655

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test2 - Cycle -2 - For 2 groups - Exp -1 and Exp-2	72.60	40	2.600	.411
	Post-test2 - Cycle 2- For 2 groups - Exp -1 and Exp-2	87.60	40	2.744	.434

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre-test2 - Cycle -2 - For 2 groups - Exp -1 and Exp-2 & Post-test2 - Cycle 2- For 2 groups - Exp -1 and Exp-2	40	.868	.000

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference
					Lower
Pair 1	Pre-test2 - Cycle -2 - For 2 groups - Exp -1 and Exp-2 - Post-test2 - Cycle 2- For 2 groups - Exp -1 and Exp-2	-15.000	1.377	.218	-15.441

Paired Samples Test

		Paired Differences			
		95% Confidence Interval of the Difference			
		Upper	t	df	Sig. (2-tailed)
Pair 1	Pre-test2 - Cycle -2 - For 2 groups - Exp -1 and Exp-2 - Post-test2 - Cycle 2- For 2 groups - Exp -1 and Exp-2	-14.559	-68.871	39	.000

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Prg test2.1- Cycle 2- For 2 groups - Exp-1 and Exp-2	72.95	40	2.611	.413
	Prg test2.2- Cycle 2- For 2 groups - Exp -1 and Exp- 2	86.28	40	3.843	.608

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Prg test2.1- Cycle 2- For 2 groups - Exp-1 and Exp-2 & Prg test2.2- Cycle 2- For 2 groups - Exp -1 and Exp- 2	40	.840	.000

		Paired Differences				
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	
					Lower	
Pair 1	Prg test2.1- Cycle 2- For 2 groups - Exp-1 and Exp-2 - Prg test2.2- Cycle 2- For 2 groups - Exp -1 and Exp- 2	-13.325	2.177	.344	-14.021	

Paired Samples Test

		Paired Differences			
		95% Confidence Interval of the Difference			
		Upper	t	df	Sig. (2-tailed)
Pair 1	Prg test2.1- Cycle 2- For 2 groups - Exp-1 and Exp-2 - Prg test2.2- Cycle 2- For 2 groups - Exp -1 and Exp- 2	-12.629	-38.718	39	.000

Descriptive

	N	Minimum	Maximum	Mean
Improvement in the scores of progress test 2 and 2.2	40	-5.00	8.00	1.1500
Improvement in the scores of progress test 2 and 2.2	40	-1.00	17.00	8.0000
Valid N (listwise)	40			

	Group number	N	Mean	Std. Deviation
Improvement in the scores of progress test 2 and 2.2	Exp. G 1 - Used books only	20	1.6500	3.32890
	Exp. G 2 - Used books only	20	.6500	1.34849
Improvement in the scores of progress test 2 and 2.2	Exp. G 1 - Used books only	20	8.5000	4.51314
	Exp. G 2 - Used books only	20	7.5000	2.87457

Improvement in the scores of progress test 2 and 2.2

Improvement in the scores of progress test 2 and 2.2

		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	t
Improvement in the scores of progress test 2 and 2.2	Equal variances assumed	13.619	.001	1.245
	Equal variances not assumed			1.245
Improvement in the scores of progress test 2 and 2.2	Equal variances assumed	3.180	.083	.836
	Equal variances not assumed			.836

		t-test for Equality of Means		
		df	Sig. (2-tailed)	Mean Difference
Improvement in the scores of progress test 2 and 2.2	Equal variances assumed	38	.221	1.00000
	Equal variances not assumed	25.072	.225	1.00000
Improvement in the scores of progress test 2 and 2.2	Equal variances assumed	38	.409	1.00000
	Equal variances not assumed	32.237	.409	1.00000

		t-test for Equality of Means	
		Std. Error Difference	95% Confidence Interval of the Difference
			Lower
Improvement in the scores of progress test 2 and 2.2	Equal variances assumed	.80312	-.62583
	Equal variances not assumed	.80312	-.65381
Improvement in the scores of progress test 2 and 2.2	Equal variances assumed	1.19649	-1.42216
	Equal variances not assumed	1.19649	-1.43646

Independent Samples Test

		t-test for Equality of Means
		95% Confidence Interval of the Difference
		Upper
Improvement in the scores of progress test 2 and 2.2	Equal variances assumed	2.62583
	Equal variances not assumed	2.65381
Improvement in the scores of progress test 2 and 2.2	Equal variances assumed	3.42216
	Equal variances not assumed	3.43646

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Improvement in the scores of progress test 1 and 2.1	1.1500	40	2.55754	.40438
	Improvement in the scores of progress test 2 and 2.2	8.0000	40	3.76897	.59593

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Improvement in the scores of progress test 1 and 2.1 & Improvement in the scores of progress test 2 and 2.2	40	.646	.000

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference
					Lower
Pair 1	Improvement in the scores of progress test 1 and 2.1 - Improvement in the scores of progress test 2 and 2.2	-6.85000	2.87830	.45510	-7.77053

		Paired Differences			
		95% Confidence Interval of the Difference			
		Upper	t	df	Sig. (2-tailed)
Pair 1	Improvement in the scores of progress test 1 and 2.1 - Improvement in the scores of progress test 2 and 2.2	-5.92947	-15.052	39	.000

Appendix I: Survey Analysis

	Component						
	1	2	3	4	5	6	7
SLFREG01							-.809
SLFREG02					.620	-.350	
Self regulation 03 recoded					.733		
SLFEF01	.782						
INTLRENV05	.790						
INTLRENV03	.672			.353			
INTLRENV01	.722						
SLFEF02	-.733						
SLFEF04	.615	.434					
INTLRENV06	.486	.463					.402
EASEUS02	.351				.510		
USEFLNS03	.440	.418		.459			.385
IPDTSK02				.691			.320
SATISF01		.814					
INTLRENV02		.841					
EASEUS03			.564	.586			
INTLRENV07		.538	.496	.448			
USEFLNS02	-.441	-.485	-.337				
IPDTSK01		.715	.447	.360			
MOTIV02		.393	.683	.324			
MOTIV03			.875				
LRNEFFCT01		.516	.474	.559			
LRNEFFCT02			.901				
Ease of use recoded				.406		.462	
Ipad task 3 recoded	.430		.482			.393	
Satisfaction3 recoded	-.494	-.669					
Satisfaction 2 recoded						.820	
Motivation 1 recoded		.304		.747			
Learning effectiveness recoded				.774			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 13 iterations.

Reliability Statistics

Cronbach's Alpha	N of Items
.808	29

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.805
Bartlett's Test of Sphericity	Approx. Chi-Square	1712.739
	df	406
	Sig.	.000

Confirmatory factor analysis:

Factor name: Self-regulation

Component Matrix[a]	
	Component
	1
SLFREG01	.378
SLFREG02	.704
Self regulation 03 recoded	.753
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Factor name: Self-efficacy

Component Matrix[a]	
	Component
	1
SLFEF01	.828
SLFEF04	.843
SLFEF02R	.794
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Factor name: Interactive learning

Component Matrix[a]	
	Component
	1
INTLRENV05	.688
INTLRENV03	.677
INTLRENV01	.608
INTLRENV06	.812
INTLRENV02	.718
INTLRENV07	.702
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Factor name: Ease of use

Component Matrix[a]	
	Component
	1
EASEUS02	.490
EASEUS03	.821
Ease of use recoded	.715
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Factor name: iPad based tasks

Component Matrix[a]	
	Component
	1
IPDTSK02	.759
Ipad task 3 recoded	.780
IPDTSK01	.786
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Factor name: Perceived satisfaction

Communalities	
	Extraction
SATISF01	.809
SATISF02	.055
SATISF03	.821
Extraction Method: Principal Component Analysis.	

Factor name: Perceived usefulness

Component Matrix[a]	
	Component
	1
USEFLNS01	.630
USEFLNS02	.968
Usefulness 3 Recoded	.968
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Factor name: Motivation

Component Matrix[a]	
	Component
	1
MOTIV02	.861
MOTIV03	.857
Motivation 1 recoded	.692
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Factor name: Learning effectiveness

Component Matrix[a]	
	Component
	1
LRNEFFCT01	.897
LRNEFFCT02	.790
Learning effecitveness recoded	.790
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Statistics

		Self regulation	Interactive learning	Self efficacy	Satisfaction	Usefulness	IPad based tasks	Motivation	Ease if use	LRNEFFECT
N	Valid	80	80	80	80	80	80	80	80	80
	Missing	0	0	0	0	0	0	0	0	0
Mean		6.6625	6.6688	6.4833	4.0375	6.7500	6.6875	6.8875	6.5542	4.9708
Std. Deviation		.32906	.35429	.50007	.22183	.42097	.51788	.25405	.33937	.09478
Minimum		5.33	5.50	5.33	3.50	5.00	5.00	6.00	5.00	4.67
Maximum		7.00	7.00	7.00	4.50	7.00	7.00	7.00	7.00	5.00

Comparison of attitudes between iPad groups and textbook groups

	iPad	N	Mean	Std. Deviation
Self-regulation	iPad groups	40	6.6083	.36893
	Textbook groups	40	6.7167	.27786
Interactive learning	iPad groups	40	6.7333	.29187
	Textbook groups	40	6.6042	.40065
self-efficacy	iPad groups	40	6.4667	.48803
	Textbook groups	40	6.5000	.51750
Satisfaction	iPad groups	40	4.0125	.21145
	Textbook groups	40	4.0625	.23170
Usefulness	iPad groups	40	6.7625	.46668
	Textbook groups	40	6.7375	.37532
IPad based tasks	iPad groups	40	6.8000	.38895
	Textbook groups	40	6.5750	.60500
Motivation	iPad groups	40	6.9250	.17683
	Textbook groups	40	6.8500	.31078
Ease if use	iPad groups	40	6.6083	.26026
	Textbook groups	40	6.5000	.39943
LRNEFFECT	iPad groups	40	4.9917	.05270
	Textbook groups	40	4.9500	.12054

		Levene's Test for Equality of Variances							
								95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Self regulation	Equal variances assumed	.782	.379	-1.483	78	.142	-.10833	-.25372	.03705
	Equal variances not assumed			-1.483	72.474	.142	-.10833	-.25389	.03723
Interactive learning	Equal variances assumed	5.996	.017	1.648	78	.103	.12917	-.02687	.28520
	Equal variances not assumed			1.648	71.297	.104	.12917	-.02710	.28543
Self efficacy	Equal variances assumed	.857	.358	-.296	78	.768	-.03333	-.25724	.19058
	Equal variances not assumed			-.296	77.733	.768	-.03333	-.25726	.19059
Satisfaction	Equal variances assumed	1.916	.170	-1.008	78	.317	-.05000	-.14874	.04874
	Equal variances not assumed			-1.008	77.357	.317	-.05000	-.14875	.04875
Usefulness	Equal variances assumed	.537	.466	.264	78	.792	.02500	-.16351	.21351
	Equal variances not assumed			.264	74.570	.792	.02500	-.16365	.21365

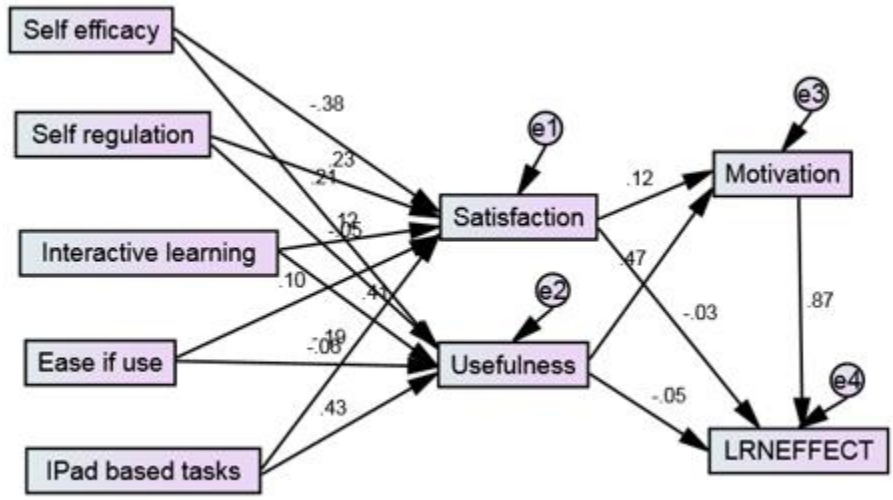
IPad based tasks	Equal variances assumed	8.493	.005	1.979	78	.051	.22500	-.00140	.45140
	Equal variances not assumed			1.979	66.535	.052	.22500	-.00202	.45202
Motivation	Equal variances assumed	8.343	.005	1.327	78	.189	.07500	-.03755	.18755
	Equal variances not assumed			1.327	61.857	.190	.07500	-.03802	.18802
Ease if use	Equal variances assumed	2.763	.100	1.437	78	.155	.10833	-.04173	.25840
	Equal variances not assumed			1.437	67.058	.155	.10833	-.04212	.25879
LRNEFFECT	Equal variances assumed	19.640	.000	2.003	78	.050	.04167	.00025	.08308
	Equal variances not assumed			2.003	53.386	.051	.04167	-.00005	.08338

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
SATISF	<---	SLFEF	-.177	.045	-3.933	***	par_1
SATISF	<---	SLFREG	.163	.068	2.385	.017	par_2
USEFLN	<---	INTLERN	.415	.089	4.670	***	par_3
SATISF	<---	INTLERN	.078	.063	1.229	.219	par_4
USEFLN	<---	EASU	-.067	.093	-.722	.470	par_5
USEFLN	<---	IPDTSK	.299	.061	4.910	***	par_6
SATISF	<---	EASU	.068	.066	1.032	.302	par_7
SATISF	<---	IPDTSK	-.083	.043	-1.913	.056	par_8
USEFLN	<---	SLFEF	.152	.063	2.411	.016	par_14
USEFLN	<---	SLFREG	-.053	.096	-.550	.582	par_15
MOTIV	<---	USEFLN	.321	.068	4.696	***	par_10
MOTIV	<---	SATISF	.123	.107	1.156	.247	par_11
LRNEFFECT	<---	USEFLN	-.012	.017	-.715	.474	par_9
LRNEFFECT	<---	SATISF	-.013	.024	-.538	.590	par_12
LRNEFFECT	<---	MOTIV	.329	.025	13.020	***	par_13

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
SATISF	<---	SLFEF	-.381
SATISF	<---	SLFREG	.231
USEFLN	<---	INTLERN	.407
SATISF	<---	INTLERN	.119
USEFLN	<---	EASU	-.063
USEFLN	<---	IPDTSK	.428
SATISF	<---	EASU	.100
SATISF	<---	IPDTSK	-.185
USEFLN	<---	SLFEF	.210
USEFLN	<---	SLFREG	-.048
MOTIV	<---	USEFLN	.470
MOTIV	<---	SATISF	.116
LRNEFFECT	<---	USEFLN	-.048
LRNEFFECT	<---	SATISF	-.032
LRNEFFECT	<---	MOTIV	.873



Tests of Normality	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Interactive learning	.216	80	.000	.852	80	.000
Self efficacy	.212	80	.000	.858	80	.000
Satisfaction	.430	80	.000	.606	80	.000
Usefulness	.399	80	.000	.645	80	.000
IPad based tasks	.377	80	.000	.657	80	.000
Motivation	.471	80	.000	.504	80	.000
Ease if use	.305	80	.000	.775	80	.000
LRNEFFECT	.533	80	.000	.317	80	.000

a. Lilliefors Significance Correction