

# CHAPTER ONE

## Introduction

### 1.0 Background

Universities around the world are moving rapidly to introduce Information and Communication Technologies (ICT) into all aspects of their core business of teaching and learning (Bates, 2001; Ryan, Scott, Freeman and Patel, 2000). Soon after that this focus on Information and Communication Technologies (ICT) in education has shifted towards curriculum integration. Consequently, teachers' education programs need to prepare graduates for teaching with ICT. Graduates should possess both; skills and confidence in the use of ICT on one hand, and the belief in using and integrating these ICT into teaching on the other hand. Decisions about course design might be informed by a measure that is directly influenced by course changes and also indicates likely long-term outcomes for teacher behavior. Therefore, it is assumed that teachers' Self-efficacy can provide such a measure especially in the context of preparing teachers to teach with ICT.

On the other hand, researchers presumed that ICT can play an integral role in teachers' personal and professional life. Inevitably, the ability to utilize this technology has become the new literacy of the twenty-first century and of critical importance to countries that seek to achieve excellence and competency within the global community. Thus, for future generations to maximize their capability to operate within competitive and technologically driven economies, it is essential to foster ICT abilities at every level of schooling process. Teachers are central to this endeavor.

In the literature, it is still being discussed whether teachers' ICT training is in fact a critical factor for promoting technology integration in classroom. Several authors have argued that an effective integration of ICT in students' learning activities will require the presence of these technologies in teachers' training. It is very difficult for teachers to use ICT in a productive way and within

a curriculum-oriented approach if they are not given the time to explore, understand and plan teaching activities and projects where such technologies do have an expression. Many authors, have therefore, stated that integrating ICT in training and developing in-service teachers appears as a factor with limited predictive power of an effective educational use of technology and that it was teachers' beliefs and perceptions of the benefits of ICT that could result in ICT-adoption (Ertmer, 2005).

Linguists assumed that the theoretical foundation of Self-Efficacy is originated in the Social Cognitive Theory, developed by Professor Albert Bandura (1977, 1997). Central to Bandura's (1997) framework is his concept of self-efficacy. Bandura's aspirations about self-efficacy were grand, as reflected in the title of his 1977 article "Self- Efficacy: Towards a Unifying Theory of Behavioral Change". In this inspiring work, Bandura defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (1997:3). Consistent with this definition and in the general formulation of self-efficacy, Tschannen-Moran and Woolfolk Hoy (2001:783) defined teacher efficacy as a teacher's "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated." (P: 783). Educationally, self-efficacy beliefs are related to academic performance and self-regulated learning (Pajares, 1996). A second factor believed to influence teachers' self-efficacy, indirectly affecting student achievement, is the professional development of teachers. Guskey (2000:16) defines professional development as the "process and activities designed to enhance the professional knowledge, skills, and attitude of educators so that they might, in turn, improve the learning of students". Recently, Self-efficacy has generated inquiry in areas as diverse as medicine, business, social and political change, psychology, and education. Self-efficacy has been especially prominent in studies of educational constructs such as academic achievement, attributions of success and failure, goal

setting, social comparisons, memory, problem solving, career development, and teaching and teacher education.

Contemporary research demonstrated that, when teachers' self-efficacy beliefs in their ability to use ICT increased through appropriate professional development, those teachers will be more likely to incorporate ICT into their future teaching strategies.

## **1.1 Statement of the Problem**

Throughout the course of his learning and teaching experience at Sudanese Universities, the researcher noted that there has been very limited attention given to the effective integration of ICT to develop the self-efficacy of pre-service teachers.

The researcher also recognized that an effective integration of ICT in Sudanese pre-service teacher education seems to lag behind other developments in education. Additionally, there is too little teacher preparation and training in terms of ICT. More importantly, while traditional approaches in pedagogy are still widely accepted and practiced, less opportunity for the successful introduction and deployment of ICT into pre-service teacher education curriculum is present. Furthermore, most of the studies and research conducted in the field of teacher training and development either, avoid or underestimate the psychological status of the pre-service teachers.

## **1.2 Research Questions**

Upon the completion of this research, the researcher hopes to find answers to the following questions:

1. To what extent does the self-efficacy of EFL pre-service teachers associated with computer access at the University and with their ICT expertise in terms of prior computer experience and qualifications?
2. To what extent can pre-service teachers of EFL use computers and hardware Products for educational purposes?

3. To what extent can pre-service teachers of EFL use software and communication services for educational purposes?
4. To what extent can pre-service teachers of EFL implement and integrate the wide range capabilities of ICT into their current learning approaches and future classrooms contexts?
5. To what extent can the self-efficacy level of pre-service teachers of EFL affect the adoption of suitable instructional principles in their classrooms?

### **1.3 Research Hypotheses**

The researcher hypothesizes the following:

1. Higher levels of EFL pre-service teachers' self-efficacy are associated positively with computer access at University, ICT expertise and related computer qualifications.
2. The pre-service teachers of EFL can use computers and hardware products for educational purposes.
3. The pre-service teachers of EFL can use software and communication services for educational purposes.
4. The pre-service teachers of EFL trust their ability to effectively implement and integrate the wide range capabilities of ICT into their current learning approaches and future classrooms contexts.
5. Pre-service teachers of EFL who have higher levels of self-efficacy can adopt suitable instructional principles in their classrooms.

### **1.4 Objectives of the Study**

The younger generations and ICT are inseparable in their everyday lives. Indeed there are some arguments emphasizing that, because of the way those digital generations grow up, their brains have physically changed. This strongly suggests that current pedagogical approaches to ICT need a total revision based on understanding the current learners' nature, needs, preferences and learning styles.

In the contest of teacher training, understanding pre-service teachers' perceptions and beliefs related to ICT hold the promise of improving their professional preparation and sense of learning community. Therefore, it is said that a better understanding of teachers' beliefs may contribute effectively to the enrichment of pedagogies as well as learning styles and approaches with ICT.

This study aims:

1. To identify the prospective role of computer access at University, ICT expertise and related computer qualifications in the development of pre-service teachers' self-efficacy.
2. To examine pre-service teachers' ability in the use of computer and hardware products for educational purposes.
3. To examine pre-service teachers' ability in the use of software and communication services for educational purposes.
4. To examine pre-service teachers' ability to effectively implement and integrate the wide range capabilities of ICT into their current learning approaches and future classrooms contexts.
5. To identify to what extent can the self-efficacy of pre-service teachers of EFL affect the adoption of suitable instructional principles in their classrooms.

## **1.5 Limits of the Study**

It is well known that there is a need to investigate the role of faculties/colleges in promoting and facilitating the integration of ICT into the pre-service teachers' curriculum. Furthermore, and on a technical note, this study deals with general self-efficacy; therefore, studying self-efficacy in respect to specific ICT tasks such as using Microsoft office applications or various ICT and the Internet tools is required.

- a. Limits of Subject Matter: This study investigates the possible impact of ICT implementation in pre-service teachers' self-efficacy.

- b. Limits of Respondents: Questionnaire respondents are BA students (4<sup>th</sup> Year) Faculty of Education Sudan University, whereas the Interview is targeting the in-service teachers at the Faculty of Education Sudan University.
- c. Limitation of Place and Date: Faculty of Education Sudan University, Academic Year 2016- 2017.

## **1.6 Significance of the Study**

It is generally presumed that rapid and massive developments of ICT worldwide have changed the nature of teaching and learning radically and it is difficult for current educational paradigms to remain unchanged. Where traditional teacher centered practices are the prevailing model, it seems inadequate to merely and simply provide pre-service teachers with technology-related literacy and limited activities, without ICT being embedded effectively in their learning activities.

Although the new learning contexts associated with ICT demand that teachers rethink their practices, this can be simultaneously daunting and challenging as the research suggests. Therefore, understanding pre-service teachers' self-efficacy can provide ways of boosting their levels of confidence and motivation.

In an effort to inform pre-service teacher education, especially in Sudan, this study provides insight into the general perceived self-efficacy of pre-service teachers and the factors that influence the integration of ICT into their curriculum. Consequently, findings and outcomes of this research are assumed to provide sufficient reasons to undertake future investigations in this area and to consider what approaches to pre-service teacher education and development might be effective in increasing self-efficacy for teaching with ICT.

## 1.7 Methodology

This study aims to contribute for developing and systematizing some knowledge in the area of ICT-teacher training, focusing on the analysis of the influence of in-service training on teachers' sense of efficacy as computer users and in their level of ICT- integration in their professional practices, both in a short term and in a medium-term perspective. For achieving this aim, the data for this research will be obtained from two resources. The methodology proposed for this collection will rely on:

- i. An initial pre-service teachers' survey- questionnaire
- ii. Follow-up Teacher Interview

They will involve the collection of both:

- i. Quantitative data, which will include pre-service teachers' personal information, their frequency of using computers, perceptions of their ICT skills and self-efficacy towards the integration of ICT in teaching.
- ii. Qualitative data which will include, pre-service teachers' levels of perceived Self-efficacy with regard to ICT, motivation, capabilities to integrate ICT into learning and teaching approaches.

## 1.8 Definition of Key Terms

- a. **Self-efficacy:** Bandura (1997:3) defined self-efficacy as “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments”.
- b. **Efficacy Beliefs:** Bandura (1993: 118) argued that “Efficacy beliefs influence how people feel, think, motivate themselves, and behave.”
- c. **Professional development** is a “process and activities designed to enhance the professional knowledge, skills, and attitude of educators so that they might, in turn, improve the learning of students”. Guskey, (2000:16).

# CHAPTER TWO

## Theoretical Framework and Literature Review

### 2.0 Introduction

This chapter reviews theoretical foundations significant to Teacher Education, conducted by a number of researchers with a special attention to the role that Information and Communication Technology (ICT) plays in the development of teaching methods of English Language.

The focus of this chapter will be on a number of four aspects. The *first* aspect will preview the most recognized methods and approaches to language teaching in the twentieth century in addition to the traditional teacher training and development models and approaches to teaching and teacher education. The *second* aspect provides a theoretical background of ICT and the importance of fostering them on teaching and learning in addition to the effect of ICT on Learning and teaching. The *third* aspect provides synopsis of the Self-concept. The *forth* aspect outlines the Social Cognitive and the Self-Efficacy Theories; definition and measurement of Self-efficacy beliefs. The aim of this part is to provide a comprehensive review of the theoretical foundation and formulation of the concept of teachers' self-efficacy. The focus will be on self-efficacy applications directly related to the educational development of teachers and the areas of inquiry that show great promise for advancement of teachers' self-efficacy. The chapter will also review some of the previous studies.

### 2.1 English Language Teaching and Linguistics

Though there are still some skeptics, most creative methodologies now agree that one of the cornerstones on which language instruction must be build is the science that deals with the nature of language itself: linguistics.

#### 2.1.1 History of Language Teaching

The aim of this brief survey is to provide background for the discussion of contemporary methods in language teaching and learning. From this historical



perspective it will be possible to see the concerns that have prompted modern method innovations were similar to those that have been the center of discussion on how to teach foreign languages. Along the same line, changes in language teaching methods throughout the history have reflected recognition of changes in the kind of proficiency learners need and a change in the theories of the nature of language teaching.

### **2.1.2 The Nature of Approaches and Methods in Language Teaching**

The changing rationale for foreign language study and the classroom techniques and procedures used to teach languages have reflected responses to a variety of historical issues and circumstances. Therefore, theories derived from linguistics, psychology, or others, were used to develop some theoretical and practical basis for language teaching. More recently, Richards (1999:14) argued that “As the study of teaching methods and procedures in language teaching assumed a more central role within applied linguistics from the 1940s on, various attempts have been made to conceptualize the nature of methods and explore more systematically the relationship between approach and method”.

Nevertheless, linguists and language specialists sought to improve the quality of language teaching in the late nineteenth century, they often did so by referring to general principles and theories concerning how languages are learned, how knowledge of language is represented and organized in memory, or how language itself is structured. In describing methods, the difference between a philosophy of language teaching at the level of theory and principles, and a set of derived procedures for teaching a language, is central. In an attempt to clarify this difference, a schema was proposed by the American applied linguist Edward Anthony in 1963. He identified three levels of conceptualization and organization, which he termed *approach*, *method* and *technique*. The arrangement is hierarchical. The organizational key is that *techniques* carry out a *method* which is consistent with an *approach*. Edward Anthony (1963:63) stated that:

... An approach is a set of correlative assumptions dealing with the nature of language teaching and learning. An approach is axiomatic. It describes the nature of the subject matter to be taught...

... A method is an overall plan for the orderly presentation of language material, no part of which is contradicts, and all of which is based upon, selected approach. An approach is axiomatic, a method is procedural. Within one approach, there can be many methods.

... A technique is implementational- that which actually takes place in a classroom. It is a particular trick, stratagem, or contrivance used to accomplish an immediate objective. Techniques must be consistent with a method, and therefore in harmony with an approach as well.

Although Anthony's original proposal has the advantage of simplicity and comprehensiveness and serves as a useful way of distinguishing the relationship between underlying and theoretical principles and the practices derived from them, "it fails to give sufficient attention to the nature of the method itself" Richards and Rodgers, (1985:16). They add to that "Nothing is said about the roles of teachers and learners assumed in a method" (p: 16). Therefore, in order to provide a more comprehensive model for the discussion and analysis of approaches and methods, Richards and Rodgers (1985) have revised and extended the original Anthony model. The primary areas they clarified are *method* and *technique*. They developed and reorganized the distinction between these terms as Approach, Design and Procedure, encompassed within the overall concept of Method, which they refer to as "an umbrella term for the specification and interrelation of theory and practice" Richards and Rodgers, (1985:6), where:

- a. Approach refers to the beliefs and theories about language, language learning and teaching that underlie a method
- b. Design specifies how theories of language and learning are implemented in a syllabus model and teaching and learning activities and materials in the classroom

- c. Procedure concerns the techniques and practices employed in the classroom as consequences of particular approach and designs.

More recently, Brown (2001:15) echoed these concerns and draws a distinction between methods as “specific, identifiable clusters of theoretically compatible classroom techniques”, and methodology as “pedagogical practices in general... whatever considerations are involved in how to teach are methodological”.

### **2.1.3 The Twentieth Century Approaches to Language Teaching**

In consideration of the learner-centered approach, task-based language learning is not only a means to enhancing classroom communication and acquisition but also the means to the development of classroom syllabuses. As such, teacher education is considered as a dynamic area in the field of English Language Teaching (ELT).

Robinson (1980:6) mentioned that learning English is the way to the acquisition of some diversity skills and knowledge. Thus, the nature of English language is considered as a means to accomplish certain goals and at the same time cannot be regarded as an end itself.

#### **2.1.3.1 The Grammar-Translation Approach**

This Approach represents the tradition of language teaching adopted in the Western society and developed over centuries of teaching not only the classical languages such as Latin and Greek, but also foreign languages.

Prator and Celce-Murica (1979:3) listed the major characteristics of Grammar-Translation:

- a. Classes are taught in the mother tongue, with little active use of the target language;
- b. Much vocabulary is taught in the form of lists of isolated words;
- c. Long, elaborated explanations of the intricacies of grammar are given;
- d. Grammar provides the rules for putting words together, and instruction

### **2.1.3.2 The Direct Approach**

The credit for popularizing the direct method usually goes to Charles Bertiz. Richards and Rodgers (2001:12) summarized the principles of the Direct Method as follows:

- a. Classroom instruction was conducted exclusively in the target language;
- b. Only everyday vocabulary and sentences were taught;
- c. Oral communication skills were built up in a carefully traded progression, organized around questions-and-answer exchanges between teachers and students in small intensive classes;
- d. Grammar was taught inductively;
- e. New teaching points were taught through modeling and practice;

### **2.1.3.3 The Audio-lingual Approach**

This method is grounded in the habit formation model of behaviorist psychology and a Structural Linguistics theory of language, the emphasis was on memorization through pattern drills and conversation practices rather than promoting communicative ability. The following characteristics adapted from (Celce-Murcia 1979:6);

- a. New material is presented in dialogue form;
- b. There is dependence on mimicry, memorization of set phrases, and overlearning;
- c. Structure of skills are sequenced by means of contrastive analysis taught one at a time;
- d. Structural patterns are taught using repetitive drills;

### **2.1.3.4 The Cognitive Code Learning Approach**

This method had limited success as the cognitive emphasis on rules and paradigms proved as unattractive as behaviorist rote drilling. There is also confusion for practitioners, with Nunan (2003:6) ascribing inductive reasoning to

it, while Brown (2001:24) notes that proponents of cognitive code learning methodology injected more deductive rule learning into language classes. The following table illustrates the characteristics of *Deductive* and *Inductive* learning methods.

Table (2:1) Deductive and Inductive learning methods

<p style="text-align: center;"><b>Deductive learning</b></p>	<p>Grammatical explanations or rules are presented and then applied through practice in exercise.</p> <p>The learner works from rules/principles to examples.</p>
<p style="text-align: center;"><b>Inductive learning</b></p>	<p>Learners are presented with examples. They then discover or induce language rules and principles on their own.</p>

#### 2.1.4 Trends in Second Language Teaching

The developments in modern language teaching have paralleled closely those trends occurring in society and education in general. At some of the Universities, efforts are continuing to discover ways and means to improve and develop bilingual education in Sudan. But, the main question to be answered in this case will be: What direction will second language teaching take in the future? Based on present conditions and trends; Kenneth Chastain (1976:37-38) expected the following developments:

- a. Instruction will become more students centered. Chosen teaching-learning objectives will be based on student attitudes and feelings as well as on cognitive abilities.
- b. The teacher will attempt to relate the course content to student-experience, interest, and goals.

- c. As the teaching procedures are developed, the teacher will attempt to match instruction with cognitive style, personality, attitudes, and social characteristics of the students. Meanwhile, the choice of methods will be based on what works in a given situation with a given objective.
- d. Teachers will seek to introduce the students to the culture of the second language. However, before they can do this well, they will need much assistance from text books authors and publishers of classroom materials.

Along the same lines, the teaching profession must work to prove its worth to young people whose primary needs revolve around two basic problems in modern society: acquiring self and social identity. Undoubtedly, the prime source of knowledge for teachers is their own classroom experience based on past procedures, performances, and results. However, they should realize that, scientific teaching without the artful expression of teacher's personality is lifeless and mechanical, but subjective teaching unaccompanied by periodic adjustments based on theory and research can be myopic, inefficient, and unproductive.

It is now generally accepted that the separation of student's cognitive capabilities from the emotional, psychological state is impossible. Kohn and Rosman (1974) state that student's social-emotional involvement in the classroom consists of three main factors: (1) interest and curiosity, (2) acceptance of classroom routine and rules, (3) task orientation. The ideal classroom goal is a situation in which all three factors work together to promote learning.

## **2.2 Second Language Teacher Education**

Language teacher education programs are likely to be housed in departments of Applied Linguistics, Education, or Languages and Literature. These three disciplines provide the knowledge base and opportunities for developing skills and dispositions for both prospective and experienced teachers.

In fact, the last decade can be viewed as a search for a theory of language teaching and, by extension, of language teacher education at both the micro and macro levels (Freeman and Johnson 1998b, Johnson 1996a, Larsen-Freeman 1990, Richards 1990). Language teacher education is a microcosm of teacher education, and many of the trends in current language teacher education derive from theory and practice in general teacher education. Richards, (1990:1) argued that although low-inference techniques and teaching behaviors can be readily taught, their aggregation does not necessarily result in good teaching.

In second language teaching, teacher education programs typically include knowledge base, drawn from linguistics and language learning theory, and a practical component based on language teaching methodology and opportunity for practical teaching. The primary goal of any graduate teacher preparation program is the preparation of effective language teachers, Richards, (1990:4) argued that “To prepare effective language teachers, it is necessary to have a theory of effective language teaching... including specification of the key variables in effective language teachers and how they are interrelated.” This theory should form the basis for the principles and content of second language teacher education, which, as Richards, (1990:4) proposed, should depend upon the following sequence:

- a. Describe effective teaching process;
- b. Develop a theory of the nature of effective language teaching; and
- c. Develop principles for the preparation of language teachers.

## **2.2.1 Approaches to Teaching and Teacher Education**

There are two approaches to the study of teaching from which theories of teaching as well as principles for teacher preparation programs can be developed.

### **2.2.1.1 The Micro Approach**

This approach looks at what the teacher does. It examines teacher characteristics such as “teacher’s interests, attitudes, judgment, self-control,

enthusiasm, adaptability, personality or degree of training to see how these factors influenced training outcomes” Richards, (1990:5).

### **2.2.1.2 The Macro Approach**

This is known as a holistic approach, as it “involves making generalizations and inferences that go beyond that can be observed directly in the way of quantifiable classroom processes.” Richards, (1990:4). It examines the total context of classroom teaching and learning in an attempt to understand “how the interactions between and among teachers, learners, and classroom tasks affect learning”. Richards, (1990:9). These “holistic approaches work towards training goals ..., and they stress the development of personal qualities of creativity, judgment and adaptability.” Britten, (1985:113). This view of teaching is reflected in the research on effective instruction, Blum, (1984:3-6) summarizes these effective classroom practices as follows:

- a. Instruction is guided by a preplanned curriculum.
- b. There are high expectations for student learning.
- c. Students are carefully oriented to lessons.
- d. Instruction is clear and focused.
- e. Learning progress is monitored closely.
- f. Class time is used for learning.
- g. Standards for classroom behavior are high.
- h. Personal interactions between teachers and students are positive.
- i. Incentives and rewards for students are used to promote excellence.

This approach to the study of teaching often termed *Active Teaching*. And according to this theory of active teaching, several dimensions of teaching account for the effective and ineffective instructions. These effective instructions were summarized by Richards, (1990:10-14) they include:

- a. **Classroom management**, which refers to the way in which student behavior, movement, and interaction during a lesson are organized and controlled by teacher to enable teaching to take place most effectively.



- b. **Structuring**; this concept is reflected when the teacher's interactions are clear and instructional activities are sequenced according to a logic and structure that students can perceive.
- c. **Tasks**; they are activity structures; they refer to the activities that teachers assign to attain particular learning objectives.
- d. **Grouping**: it is a dimension of active instructions in which learners are grouped to carry out instructional tasks and the relation between grouping arrangement and achievement.

“According to the theory of active teaching, effective instruction therefore depends on factors such as time-on-task, question patterns, feedback, grouping and task decisions, as well as on factors such as classroom management and structuring. Some of these can be categorized as low-inference and others as high-inference categories.” Richards, (1990:12).

### **2.2.2 Applications for Teacher Preparation**

Activities in the second domain- the macro perspective- reflect a view of teacher preparation as Education and focuses on clarifying and elucidating the concepts and thinking processes that guide the effective second language teacher. Activities and experiences are needed that help novice teacher understand and acquire the means by which the effective teacher arrives at significant instructional decisions. Learning experiences include the following:

- i. Practice teaching
- ii. Observation
- iii. Self-and-peer observation
- iv. Seminars and discussion activities.

In sum, these approaches to teacher preparation require changes in the role of both, student teacher and teacher educator. Therefore the intent of second language teacher education must be to provide opportunities for the novice to acquire the skills and competences of effective teacher and to discover the working rules that effective teachers use.

### **2.2.3 Teacher Preparation Procedures**

They indicate what procedures for exploiting such activities as evaluating and ranking. Here are some of the possibilities:

- a. Lectures: provide straight input. They can supply a raw material for student teacher to operate on.
- b. Group/pair discussion: student teachers work using activity sheets.
- c. Workshops: student teachers work to prepare something like classroom materials, teaching aids or lesson plans.
- d. Individual work / assignments.
- e. Demonstrations: the teacher educator demonstrates a particular technique, using either actual students or student teachers.
- f. Practice acceptance and refusing things.

### **2.2.4 Action Research in the Language Classroom**

This section takes as its point of departure the notion that classroom teachers should be involved in curriculum research and development as these relate to their own classrooms and that a primary goal for in-service teacher education is to give teachers ways of exploring their own classrooms.

However, such involvement presupposes certain skills and knowledge in classroom observation and research. These skills can be developed through action research projects wherein professional development programs can feed into a constant cycle of intervention, monitoring, and modification to classroom practice. Therefore, it is crucial that teachers develop a range of skills in planning, monitoring, and evaluating their own professional activities.

On the other hand, one of the problems with teachers as researchers, however, is that they often lack appropriate training in collection and interpretation of classroom data. Therefore, one way of encouraging teachers to develop research skills is to get them to adopt an action research orientation to their classroom.

## **2.3 Fostering ICT on Teaching and Learning**

The effective and appropriate use of Information and Communication Technology (ICT) in education shows high levels of improvement in teaching and learning processes. The growth of ICT in society is reflected in policies to encourage the use of ICT in education and the development of educational multimedia. As the role of educational multimedia increases, it is increasingly important to have an idea of the potential it affords for teaching and learning. ICT has become commonplace entities in all aspects of life. Within education, the effect of ICT has not been as extensive as in other fields. The use of ICT in education lends itself to more student-centered learning settings and often this creates some tensions for some teachers and students. But with the world moving rapidly into digital media and information, the effect of ICT on education is becoming more and more important and this importance will continue to grow and develop in the following years. The aims of this part are to review the effect of ICT on learning and learners, teaching and teachers. A review of the literature will determine how ICT can have a strong effect on educational performance, learning, teaching, communication.

There are many theories and studies describing the profound implications of ICT for education: education can be transformed using ICT which brings new capabilities and capacities to learning. ICT has the potential enabling teachers and students to construct rich multi-sensory, interactive environments with almost unlimited teaching and learning potential. ICT offers numerous advantages and provides opportunities for facilitating learning for children who have different learning styles and abilities, including slow learners, the socially disadvantaged, the mentally and physically handicapped, the talented, and those living in remote rural areas; making learning more effective, involving more senses in a multimedia context and more connections in a hypermedia context; and providing a broader international context for approaching problems as well as being more sensitive response to local needs (Amstrong, D. et al., 2004).

### **2.3.1 Effect of ICT on Learning**

Most educational researchers agree that there is not a direct link between ICT and learning because learning is mediated through the learning environment and ICT is only one element of that environment. Studies that have tried to identify this mediated impact of ICT on learning have found it impossible to entirely remove the effects of other elements of the learning environment. There is little purpose in attempting to compare the cognitive outcomes when using computers, with using a textbook or some other resource.

Therefore, if the aim is to offer new learning opportunities or to improve the way in which current learning activities are implemented, then the overall effectiveness of learning environments and episodes is of paramount concern, not whether they are more effective with or without computers. Therefore in implementing computer applications it is necessary to start by deciding what a student, teacher or school wants to achieve.

### **2.3.2 Effect of ICT on the Learners**

The effects of ICT on the learners can be categorized as follows:

#### **2.3.2.1 Engage students by Motivation and Challenge**

Computer systems provide the opportunity to create a wide range of interesting learning experiences. This is likely to help to maintain student interest and interest a wider range of students. The interactive and multimedia features within software can be used to help students grapple with concepts and ideas. Students can more readily be provided with similar information and experiences within a variety of contexts.

#### **2.3.2.2 Provide Tools to Increase Student Productivity**

While it may be necessary for students to develop the low-level tasks at some time on most occasions they are pre-requisite to some higher level tasks. Unnecessary repetition of low-level tasks is inefficient, non-motivational and may obscure the real purpose of the learning activity. Many computer applications provide the tools to support students in quickly completing these

lower-level tasks so that they can focus on the main purpose of the activity. Word processors, graphics packages, database packages, spreadsheets and other software support the performance of students.

### **2.3.2.3 Increasing Learner Independence**

Computer systems are increasingly being used to provide learning experiences when and where they are needed. This provides students with greater independence not only in terms of when and where they learn but also what they learn. Teachers may provide students with access to software allowing students to select different learning experiences. The class does not have to be treated as one group. Students may consider learning topics independently of the teacher. This is often discussed in terms of lifelong learning, learner-driven learning or project-based learning.

### **2.3.2.4 Collaborative and Cooperative Learning**

Collaboration is a philosophy of interaction and personal lifestyle where individuals are responsible for their actions, including learning and respect the abilities and contributions of their peers. Cooperation is a structure of interaction designed to facilitate the accomplishment of a specific end product or goal through people working together in groups. Studies have found that ICT provides good support for team-based project work (The National Foundation for the Improvement of Education, 2001). The use of ICT to support collaborative and cooperative learning is extrapolated to the support of a learning community.

### **2.3.3 Effect of ICT on Teaching**

The effect of ICT on teaching can be reviewed by observing and analyzing:

- a. The use of specific technologies and applications by teachers
- b. Teacher-student relationships
- c. General use of ICT

#### **2.3.3.1 Specific Technologies and Applications**

Structured approaches to Internet research have the potential to develop students' search and research skills which are transferable across the curriculum.

These approaches involve various processes such as the use of keywords, the identification of likely information sources, the evaluation of resources found, and the adaptation and synthesis of information from various sources. Using email to create more authentic situations in collaborative projects is a favorite approach for some teachers.

### **2.3.3.2 Teacher-Student Relationships**

The effects of ICT in educational contexts are its potential to alter the teacher-learner relationship, to shift the balance from the dominant provider/recipient model to a more facilitative approach, thereby promoting greater independence of learning. Teachers are aware that ICT can change the way they interact with their pupils. This is evident when teachers encourage students to explore software within a clear structure of teacher support and intervention. Increased pupil autonomy brings with it less teacher control over activities and therefore teachers report monitoring problems. It is not always possible to determine the extent to which the pupils are actually learning. Control is a concept deeply rooted in traditional teaching and education and so giving up control and placing more trust in pupils seems to be difficult for teachers. Even though most teachers recognize the potential benefits of collaborative working with ICT, far fewer actually capitalize on this.

### **2.3.3.3 General Use of ICT**

ICT can enhance teaching in several ways:

- a. By enhancing what is already practiced and by introducing new and better ways of teaching and learning.
- b. Engaging students in project oriented tasks and encouraging them to work in groups as well as individually, e.g. searching for information on the Internet;
- c. Differentiating between students;
- d. Enabling pupils more often to work individually than together;

- e. Using ICT where and when it supports the subject content of their teaching, rather than to support their pedagogical methods (Ramboll, 2006).

Teachers should increase their use of ICT in lessons where students search for information on the Internet and further the use of both standard and subject specific Applications. Teachers should exploit the creative potential of ICT and engage students more actively in the production of knowledge. “ICT generally has a positive impact on teaching and learning situations, but compared with the ideal expectations, the impact of ICT on teaching and learning must still be considered to be limited” (Ramboll, 2006). ICT improves pupil performance and can be used as a tool to support both subject content and pedagogy. Teachers can use ICT the most, use ICT in the most project-oriented, collaborative and most experimental ways. The impact of ICT is highly dependent on how it is used. Teachers see the greatest impact of ICT in quite different teaching and learning situations. Some teachers feel ICT has greatest impact when used to as a tool to create a physical product, others see ICT as a powerful tool to support group and project work (Ramboll, 2006).

#### **2.3.4 Effect of ICT on Teachers**

Teachers are a key component in the learning environment and therefore the effect of ICT on teachers and the strategies they employ to facilitate the environment are important. Using ICT to support learning requires change for all teachers whereas clearly some teachers have been creating appropriate learning environments for years without using ICT. Thus, knowing how educational technology changes teaching practices as well as the ways in which students learn is fundamental for evaluating its effectiveness and for developing better tools. We must be sensitive to the ways in which technology use can affect outcomes, and must consider the ways in which individual differences change the use of technology as well as learning processes and outcomes.

Information and Communication Technology facilitates teaching learning process. Using ICT, learners are able to participate in learning communities throughout the world. They are independent and free in choice of their programs of study and access to the resources. They may learn collaboratively, share information, exchange their learning experiences and work through cooperative activities in learning communities. ICT facilitates teaching learning process in more productive fashion. Teacher facilitates and guides the learners in their study playing the role of a coach or mentor.

Teacher is not at the center of the instruction and sole source of information as in conventional classrooms. He/she decides contents/experiences and/or activities, locates the resources and guides learners how to have access and utilize the information for required outcomes. ICT is restructuring teaching learning process to meet the International standards. Where studies have been conducted to measure the direct impact of ICT on student learning and teaching it has not been possible to identify a purely ICT effect disentangled from other elements of the learning environment.

Furthermore, it has become increasingly difficult to measure student learning as more is understood of the complexities of learning. These factors have to be taking into consideration when looking at the evidence for ICT and learning and ICT and teaching. Fundamentally any change is aimed at improving the educational opportunities for all students and not just to make use of ICT.

### **2.3.5 Integration of ICT-Pedagogy in Teacher Training**

While information and communication technology (ICT) is not a panacea for all educational problems, today's technologies are essential tools for teaching and learning. To use these tools effectively and efficiently, teachers need visions of the technologies' potential, opportunities to apply them, training and just-in-time support, and time to experiment. Only then can teachers be informed and confident in their use of new technologies (Bowes, 2003). Teaching is becoming one of the most challenging professions in our society where knowledge is



expanding rapidly and much of it is available to students as well as teachers at the same time (Perraton, Robinson, and Creed, 2001). As new concepts of learning have evolved, teachers are expected to facilitate learning and make it meaningful to individual learners rather than just to provide knowledge and skills.

Modern developments of innovative technologies have provided new possibilities to teaching professions, but at the same time have placed more demands on teachers to learn how to use these new technologies in their teaching (Robinson and Latchem, 2003). These challenges ask teachers to continuously retrain themselves and acquire new knowledge and skills while maintaining their jobs.

Nowadays, a variety of ICT can facilitate not only delivery of instruction, but also learning process itself. Moreover, ICT can promote international collaboration and networking in education and professional development. There's a range of ICT options – from video conferencing through multimedia delivery to websites - which can be used to meet the challenges teachers face today. In fact, there has been increasing evidence that ICT may be able to provide more flexible and effective ways for lifelong professional development for today's teachers. Because of rapid development in ICT, especially the Internet, traditional initial teacher training as well as in- service continued training institutions worldwide are undergoing a rapid change to design suitable syllabus that meet these changes.

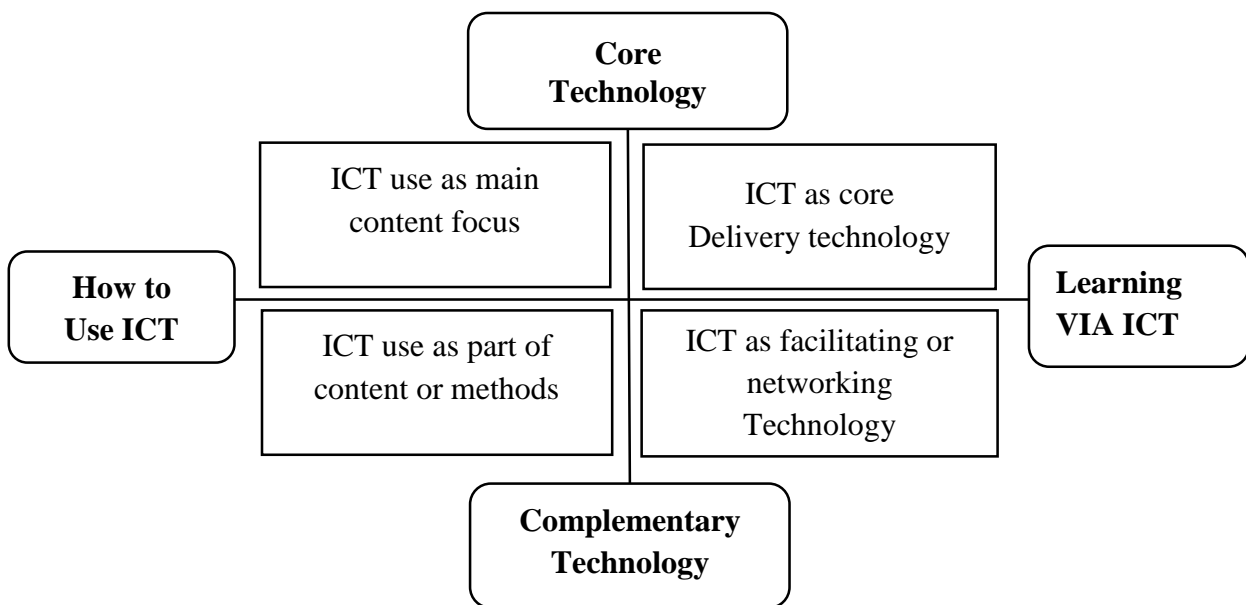
### **2.3.6 Teachers' ICT Training Approaches**

Research indicates that ICT can change the way teachers teach and that it is especially useful in supporting more student-centered approaches to instruction and in developing the higher order skills and promoting collaborative activities (Haddad, 2003). Recognizing the importance of ICT in teaching and learning, a majority of the countries in the world have provided ICT teacher training in a variety of forms and degrees. Even though many teachers report that they have not had adequate training to prepare themselves to use technology effectively in

teaching and learning, there seem to be several efforts around the world in which countries are effectively using technology to train teachers, and/or are training teachers to use technology as tools for enhancing teaching and learning. ICT teacher training can take many forms.

Teachers can be trained to learn HOW to use ICT or teachers can be trained VIA ICT. ICT can be used as a core or a complementary means to the teacher training process (Collis and Jung, 2003). The following section organizes various ICT teacher training efforts found in different countries into four categories using the framework of the following figure Collis and Jung, (2003:17).

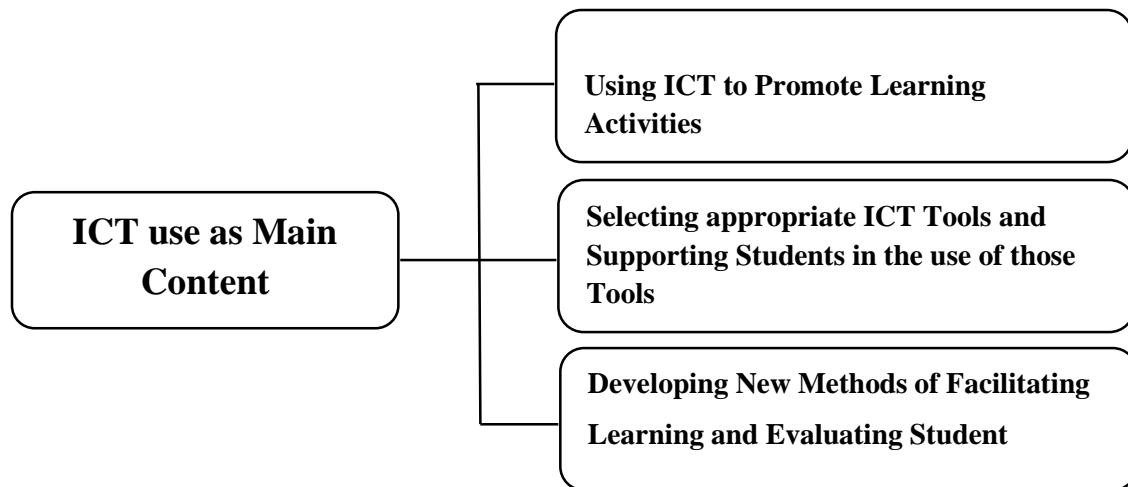
Figure (2:1) Categories for ICT in Teacher Training



### 2.3.6.1 ICT Use as Main Content Focus of Teacher Training

Most of the early ICT teacher training programs in the 1990s' focused on ICT use as the main training content. This approach has an emphasis on teacher training in how to use ICT in the classroom. It addresses issues such as selecting appropriate ICT tools and supporting students in the use of those tools, using ICT to promote learning activities, developing new methods of facilitating learning and evaluating student performance, and so on. Issues addressed in this approach contain the scopes of the following figure:

Figure (2:2) ICT Use as Main Content Focus of Teacher Training



Furthermore, one example case from Singapore's initial teacher training is provided below.

As Singapore's only pre-service teacher training institute, the National Institute of Education (NIE) was entrusted with the responsibility for integrating ICT into initial teacher training programs based on the Master plan for Information Technology in Education. Accordingly, the NIE developed and began implementing a new ICT plan in 1998, which identified four main areas that needed change: Curriculum; Physical and Technological Infrastructure; Human Resource Infrastructure; and Research and Development in the use of ICT in education.

As presented in the above figure and for the purpose of this chapter, the focus will be on how NIE has revised its curriculum to promote ICT use in the classroom for future teachers (Jung, 2001). The curriculum was revised to include three kinds of ICT courses for student teachers: basic ICT-skill workshops, a 30-hour ICT foundation course, and a 26-hour elective course. In addition, the 6 to 12 hours of ICT integration into each curricular subject class was recommended. Basic ICT skill workshops, paid for by students, are provided by external organizations and cover word processing, PowerPoint, Internet literacy, and other

technical skills. A 26-hour elective course covers the design and production of computer-based instruction. A 30-hour ICT foundation course is entitled “Instructional Technology” and covers: “learning, thinking and the effective use of instructional technologies in the classroom; instructional planning models; selecting, creating, evaluating, and integrating instructional technologies and resource materials; promoting creativity and complex thinking through ICT project work activities; and organizing and managing instructional activities with appropriate ICT resources in the classroom.” Besides taking these courses, NIE students pursuing a Diploma in Education must have five weeks of practicum during the first year of their pre-service training and ten weeks during the second year. The trainee is expected to use ICT while teaching, depending on the school’s ICT infrastructure.

As shown in the NIE’s case, this approach of using ICT as the main content focus of teacher training emphasizes the development of basic ICT skills, design and development skills, and pedagogical strategies. However, the basic ICT skill development, rather than the ICT-pedagogical integration, has been the major concern of teacher training. When interviewed about the new teacher training curriculum, student teachers at NIE agreed that the foundation course provided useful pedagogical strategies for the use of ICT in classroom teaching. However, they also reported that the 30 hours of instruction was not enough time to gain proficiency in ICT-pedagogy integration, and some wanted more ICT-pedagogy integration in the practicum. The subsequent approach provides a more effective way of ICT-pedagogy integration in teacher training programs.

#### **2.3.6.2 ICT Use as Part of Teaching Methods**

This approach integrates ICT into teacher training to facilitate some aspects of training. Two cases below show how a variety of ICT are adopted as part of effective training methods. In these cases, teachers are provided with examples of ICT-pedagogy integration in their training process.

Captured Wisdom (<http://www.ncrel.org/cw/>) is a resource developed by the federally-funded (USA) North Central Technology in Education Consortium for K-12 teachers, school administrators and extended to adult literacy educators. It uses videotape and CD-ROM to help US teachers to see how technology can be integrated into their work. The Captured Wisdom (tm) CD-ROM Library is made up of stories about teachers who are making meaningful and creative uses of technology in their instruction. These CD-ROMs contain video descriptions and demonstrations of how technology is used in teachers' classrooms. They provide examples of real educators and learners using successful practices of technology to support instruction and learning in their classrooms. Video sequences are viewed by teachers' focus groups who then discuss the strategies and techniques of classroom management, assessment, etc. In this specific case, teachers learn how to use ICT in their classrooms by actually being engaged in the process of ICT-integrated training.

Another example of this approach can be found in the School Administrators' Technology Integration Resource (<http://www.satir-ritas.org>) project. It is a bilingual Canadian initiative which provides tools and resources to help school administrators successfully integrate ICT into curriculum in their school. It includes the National Center for Technology Planning clearinghouse of school district ICT plans, advice on how to provide technology, successful practices in introducing ICT, perspectives on staff development, a beginners' guide to the Internet, etc. The focus of this project is not on the basic skill development but on the development of ICT- pedagogy integration skills of educators by sharing successful cases and practical ideas.

UNICEF's website under the title "Teachers Talking about Learning" (<http://www.unicef.org/teachers/>) also illustrates the application of this approach to ICT teacher training. It is designed for international collaboration between teachers in developing countries using the Internet and television. It provides

access to teacher training materials and useful links and promotes discussions among teachers.

All the cases discussed above use ICT as part of training methods and promote teachers' ICT-pedagogy integration in the classroom by demonstrating examples and allowing discussions among teachers throughout the whole training process. Participants of the training are asked to actually use ICT to learn about ICT skills and develop ICT-integrated pedagogies. These training strategies seem to be supported by previous research that argues that teachers are likely to benefit by actively experiencing ICT skills as a learner (Jung, 2003).

### **2.3.6.3 ICT as Core Technology for Delivering Teacher Training**

In this approach, ICT is used as the major way of providing the learning experience of teacher training. The content of this approach does not necessarily focus on ICT skill itself but rather covers a variety of ICT applications. As illustrated in the two examples below, the digital technology is frequently becoming the core technology of ICT teacher training.

The Virtual High School (VHS: <http://www.govhs.org/website.nsf>) in the USA provides an example of the Internet-based ICT teacher training. VHS is a non-profit organization that facilitates a collaborative of participating secondary schools; for every semester a participating school offers a VHS NetCourse that school can enroll up to 20 students in VHS courses. A limited number of student-only schools are allowed to enroll students (10 per semester) on a trial basis, for a single year, after which they must train a teacher and join VHS as a fully participating school. The VHS has developed two graduate-level online professional development courses for teachers of participating high schools: a 26-week Teachers Learning Conference (TLC) course which trains teachers to develop and teach a NetCourse for VHS and a 15-week Netcourse Instructional Methodologies (NIM) which trains teachers to teach an existing online VHS course.

The TLC is designed to train teachers to become online course instructors and course developers whereas the NIM is designed to prepare classroom teachers to become online course instructors only. The TLC provides instruction on the pedagogy and methodology that each teacher will need to develop an effective NetCourse to be offered to the VHS students. A facilitator, a veteran VHS teacher, is assigned to each TLC participant to ensure that they have the correct resources to achieve training objectives. The focus of the NIM is on content and curriculum, as well as good online course delivery. Experienced facilitators are assigned to help NIM participants access the correct resources and monitor each participant's progress.

Both of the teacher training courses at VHS use the Internet as the main delivery technology and focus on ICT- pedagogy integration in an online learning environment. Support given by facilitators of these courses is known as an important factor which helps teachers have positive experiences with technology and integrate technology into their own teaching (Freeman, 1997).

One more case of adopting ICT as the core delivery means of teacher training can be found in the LearnLink project (<http://www.aed.org/learnlink>) supported by USAID and AED. The project has implemented computer-mediated professional development programs to improve training and support services for teachers in several developing countries (Fontaine, 2000; Collis and Jung, 2003). For example, in Guatemala, the project includes the development of culturally appropriate Mayan language instructional materials, and improvement of teacher's professional skills in Mayan languages. Necessary equipment and multimedia computer labs have been installed in several teacher training schools in the Quiche region and instructional materials for bilingual teacher preparation, including an interactive multimedia system on CD-ROM to train teachers in oral and written languages have been developed.

In Morocco and Namibia, the Computer Assisted Teacher Training project has started to develop computer-assisted teacher training courses and construct

communications network to facilitate interaction among teacher trainees, teacher trainers, and inspectors. Moreover, collaboration and information sharing among peers across the provinces have been emphasized. Similarly, the Connectivity for Educator Development project in Uganda has been designed to improve professional development for primary school teachers, with a focus on multimedia-assisted teacher training and digital library resources. The US-Brazil Learning Technologies Network is an Internet-based learning environment and clearinghouse on the role of ICT in education and promoting interactive collaboration between teachers in the two countries.

The LearnLink project is still under implementation. Some of the expected outcomes include: increased collaboration and interactions among educators in each country or among countries, institutionalization of support for learning technology in each country, greater ICT access for teachers and students, ICT-based curriculum reform, and enhancement of pedagogy.

An Internet-based online teacher training is recently introduced and has been found to provide a flexible and interactive training environment for teachers (Jung, 2003). However, costs related to the online training cannot be ignored in most parts of the world and effective online training pedagogies for ICT teacher training have yet to be explored.

#### **2.3.6.4 ICT Use to Facilitate Professional Development**

Whereas the use of ICT as core technology for delivering teacher training can be found in limited contexts, there are many examples of ICT, particularly Internet and Web-based communication technologies, being used to support teachers' on-going professional development and networking. Many countries have developed a website or websites to provide online resources for teachers and facilitate teachers' networking based on the assumption that professional development should be an integral part of daily practice for all teachers and the use of the Internet would enhance continuous professional development activities



of teachers, connecting teachers to larger teaching communities and allowing for interaction with expert groups. Specific examples are discussed below.

The UK Virtual Teacher Centre (<http://vtc.ngfl.gov.uk>) website provides a "Career Development" area which provides a variety of learning and teaching resources and links to support teachers' continuing professional development. Under "Support Providers", for example, teachers can find a range of resources for professional development, such as the ICT Support Network Directory which provides easy access to ICT provision and training. Teachers also find a link to the New Opportunities Fund (NOF), which is currently providing ICT training for teachers and librarians. "International Professional Development" helps teachers learn from and contribute to educational ideas and best practice throughout the world. TeacherNet UK (<http://www.teachernetuk.org.uk>), an independent professional association for teachers, also supports teachers' professional development and national and international teacher networking.

The Korea's EduNet (<http://www.edunet4u.net/>) is an integrated educational internet services for K-12 students and teachers managed by the Korea Education and Research Information Services. Through the EduNet, teachers can search the materials according to training institution, content, instructor, year of publication and type of training, and download them for self-training. These online materials can be also used for individual study in conjunction with face-to-face courses, or as learning resources for online teacher training courses offered by educational institutions.

Another Similar example to the above cases, the US Teachers Network (<http://www.teachnet.org>), a nationwide, and educational non-profit organization, identifies and connects innovative teachers exemplifying professionalism and creativity within public school systems. This network promotes interactive collaboration among teachers and educators to improve teaching and student achievement, provides resources for designing their own

professional development, disseminates the work of outstanding classroom teachers, and attempts to provide teachers with the knowledge and skills needed for good teachers.

At the international level, the World Bank's World Links for Development (WorLD) (<http://www.worldbank.org/worldlinks/english/index.html>) program provides Internet connectivity and training for teachers, teacher trainers and students in developing countries in the use of ICT and other technologies in education. WorLD, then links students and teachers in secondary schools in developing countries with schools in industrialized countries for collaborative learning via the Internet.

One of the best ways to develop teachers' ICT skills and promote ICT-pedagogy integration in their teaching is the provision of ICT-based training environments where on-demand access to materials, peers, and networks of experts where expertise and advices can be obtained and active discussion can take place in relation to technology or pedagogy. In this regard, the approach of using ICT to support teachers' on-going professional development and networking can be very effective as long as organized support is provided (Pacey, 1999).

### **2.3.7 ICT Adoption Possibilities and Challenges**

The aforementioned analysis of approaches in ICT teacher training indicates that there are possibilities and challenges in adopting ICT in teacher training and professional development. Some possibilities are discussed below.

Overall, governments and teacher training institutions seem to recognize the importance of integrating ICT in education and teacher training. In many cases, the national vision for ICT use in education has been integrated into teacher training. For example, Singapore's teacher training institute has successfully integrated the national vision toward ICT use in education into its ICT plan. Other countries such as UK, USA, South Africa, Sweden and Korea have developed extensive online resources and encouraged active exchanges of new

pedagogical ideas to upgrade teachers' knowledge and skills at the national or international level. In addition, the LearnLink project in several developing countries is being implemented with close relationship with each country's government to integrate its activities into the nation's educational vision and policies.

It is also observed in the analysis that a variety of ICT-integrated training environments have been created to provide more effective ICT training. As indicated above, teachers tend to integrate ICT in their teaching if they experience ICT skills as a learner. Teacher training approaches in this section show that many cases adopt ICT into their training process not just as content of the training but rather as an integrated training environment and thus allow teachers to experience ICT-based pedagogies. The cases of VHS and Captured Wisdom are those examples. One UK site has compiled cases of technology-integrated pedagogical strategies for teachers and made suggestions in incorporating ICT into the curricula (<http://www.educ.cam.ac.uk/tips/reports.html>).

More hands-on experiences that relate ICT to the achievement of wider pedagogical objectives are suggested at the initial training level and at the advanced level, the provision of opportunities for teachers to produce and disseminate ICT-based instructional materials is recommended.

Another possibility with the use of ICT in teacher training is that it connects teachers to a larger international teaching community. Several cases analyzed above operate the Internet-based teachers' learning community and support teachers to interact with peer teachers as well as teachers in other countries. Moreover, they invite experts to provide expertise to teachers through online forums or emails. Best practices in using ICT in teaching and learning and successful pedagogies are now being shared among teachers scattered around the world. While these possibilities are observed in ICT teacher training approaches, those experiences also impose challenges to teachers, teacher training institutions, and nations. Some of the challenges are presented below.

a. First, teacher training approaches need to adopt cost-effective strategies.

Most nations have limited resources for teacher training and must make decisions based on cost-effectiveness. The teacher training experiences provide several cost-saving strategies:

- i. Maximize use of computer facilities in training centers to lower user contact hour costs through efficient scheduling. Outside training hours, open computer labs to the public for a small fee (as Uganda has planned in the Connect-ED project).
- ii. Standardize on hardware and software and negotiate best prices with vendors. Complementary peripheral devices can mean savings in hardware costs and free, public-domain software lowers costs. Some vendors include ICT skills training in the purchase price.
- iii. Share Web-based resources and training materials with other training institutions.

b. Second, support and investment in teacher trainer training is important for the adoption of ICT for teacher training. The experiences of NIE, VHS, and LearnLink indicate the importance of providing a variety of both formal and informal teacher trainer training systems so that trainers could take advantage of the methods which suit them best. Experience shows that to enlist staff support and involvement, it is useful to:

- i. Employ a variety of teacher trainer training methods, ranging from face-to-face workshops to online self- study programs depending on training objectives and environments.
- ii. Integrate informal support into the formal teacher trainer training system so that the less experienced teacher trainers can obtain timely assistance.
- iii. Plan to provide multiple incentives such as workload reduction, recognition and reward in faculty evaluations, increased research allocations to encourage use of ICT in teaching, and compensation

for those providing educational or technological assistance to others.

- c. Finally, national and international partnerships across public and private sectors need to be formed to share resources, knowledge, and experiences in providing effective and efficient ICT teacher training. ICT teacher training efforts made by organizations have shown training advantages of international collaborations and benefits of using ICT for teacher training. One of such advantages of international collaboration is to bridge the gap between ICT haves and have-nots.

Governments or teacher training institutions seeking to promote national and international partnerships should:

- i. Provide incentives for private and public participation and investment in ICT teacher training.
- ii. Remove legal barriers – for example, classroom attendance requirement – to online training courses shared by several countries or institutions.
- iii. Incorporate a plan to lessen the digital divide that may exist in participating countries or training institutions.

### **2.3.8 Creating Teachers for Tomorrow**

The role of teachers and the skills they require are changing as learner expectations and access to information grow. In addition, the balance of emphasis between knowledge acquisition and skills development is changing with a growing focus on the 21<sup>st</sup> century skills. Teachers for tomorrow have new opportunities to develop pedagogies which enable realization of the potential of each learner, which work across subjects and disciplines, and which engage and motivate learners. This section will focus on the professional development needs of twenty-first century teachers, both in preparations for teaching and as they develop their practice.

While new technologies will be a key driver in the improvement and creation of teachers for tomorrow, there is a need to address twenty-first century professional development as well. Teachers are at the heart of educational development. Advanced ICT work as powerful education tools both for teachers and students. For teachers they become multifunctional teaching tools and for students at schools or at home they function as convenient learning resources. One of the most important tasks for the future will be to provide high-quality educational content through advanced platforms around the world.

### **2.3.9 The Concept of Self**

Research shows that students who have a good self-concept will achieve more in their studies. Researchers found a significant correlation between self-concept and achievement at the three grade levels included in their data. Other studies showed that the relationship between self-concept and achievement was reciprocal. A good self-concept improved achievement, and at the same time better grades enhanced the student's self-concept. In a study related directly to achievement in second language learning.

### **2.3.10 Skills for the Twenty First Century**

Much good work has been done to identify 21<sup>st</sup> century skills-such as learning to learn, critical thinking and creative knowledge-building- some of which are new and related to digital technologies, while others have long histories stemming at least from the teachings of Socrates and Plato. In view of the current pace of change and the continuous need to adapt, these skills must now be made relevant to the concept of lifelong learning.

### **2.3.11 The Concept of Belief**

The concept of belief, which has been a common feature of research papers in education for the past decade, has recently come into favor in ELT. So, what are beliefs? The concept becomes clearer if we consider some common features of its definition.

- a. The truth element: a belief is a mental state which has as its content a proposition that is accepted as true by the individual holding it, although the individual may recognize that alternative beliefs may be held by others. And this is one of the key differences between belief and knowledge, in that knowledge must actually be true in some external sense.
- b. The relationship between belief and behavior, most definition of belief propose that beliefs dispose or guide peoples' thinking and action.

## **2.4 The Social Cognitive Theory and the Self-Efficacy Beliefs**

Albert Bandura's concept of self-efficacy was developed as part of a larger theory, the Social Learning Theory, which has progressed into the Social Cognitive Theory. Social Cognitive Theory was presented by Bandura in response to his dissatisfaction with the principles of behaviorism and psychoanalysis. The following part will provide a historical overview and attributes of the Social Cognitive and the Self-Efficacy theories.

### **2.4.1 Social Cognitive Theory**

At the turn of the twentieth century, much attention focused on the impact of how human behavior was affected by the idea of self and how one's self-perception affects behavior. An American psychologist, William James believed that "introspective observation is what we have to rely on first and foremost and always" (p: 185). James was among the first psychologists to address "self-esteem," defining it as a feeling about one's self and what one thinks of personal accomplishments in relation to other members of society (Pajares, 2002).

In 1941, Miller and Dollard proposed a theory of social learning and imitation. It was a theory of learning, however, that failed to take into account the creation of novel responses or the processes of delayed and non-reinforced imitations. In 1963, Bandura and Walters wrote *Social Learning and Personality Development*, broadening the frontiers of social learning theory with the now familiar principles of observational learning and vicarious reinforcement.

The humanistic movement waned during the 1980s as psychologists shifted their interest to cognitive processes and information-processing views of human functioning. This cognitive revolution, as it came to be called, was influenced by technological advances and by the advent of the computer, which became the movement's signature metaphor. Much like their humanistic predecessors, the new wave of theorists emphasized internal, mental events, but this emphasis was primarily on cognitive tasks such as encoding and decoding human thinking, information processing strategies, higher-order thinking, memory processes, and problem-solving rather than on issues related to the self.

The 1970s and 1980s brought about the “cognitive revolution” influenced greatly by technological advances such as the computer. Psychologists turned their attention to internal, mental tasking such as information processing, schema building, and problem-solving. Additionally, a nationwide concern that academic standards had dropped drastically, caused a “back to basics approach to curriculum and practice” in the educational system (Pajares, 2002).

By the 1970s, however, Bandura was becoming aware that a key element was missing not only from the prevalent learning theories of the day but from his own social learning theory. Regardless of the movement, renowned social cognitivist, Albert Bandura (1977) identified in his publication, *Self-efficacy: Toward a Unifying Theory of Behavioral Change*, what he believed was an instrumental aspect missing from all theories of the day, including his own social learning theory— “self-efficacy.” Describing individuals as having apperception of their capabilities that impact and help to determine choices of activities and persistence in reaching a goal, Bandura referred to these self-perceptions as *self-efficacy*.

With the publication of *Social Foundations of Thought and Action: A Social Cognitive Theory*, Bandura (1986) discussed a social cognitive theory in which he described people as having beliefs about their own capabilities, thereby, advanced a view of human functioning that accords a central role to cognitive,



vicarious, self-regulatory, and self-reflective processes in human adaptation and change. From this theoretical perspective, human functioning is viewed as the product of a dynamic interplay of personal, behavioral, and environmental influences. For example, how people interpret the results of their own behavior informs and alters their environments and the personal factors they possess which, in turn, inform and alter subsequent behavior. This is the foundation of Bandura's (1986) conception of reciprocal determinism, the view that (a) personal factors in the form of cognition, affect, and biological events, (b) behavior, and (c) environmental influences create interactions that result in a triadic reciprocity.

The reciprocal nature of the determinants of human functioning in social cognitive theory makes it possible for therapeutic and counseling efforts to be directed at personal, environmental, or behavioral factors. Strategies for increasing well-being can be aimed at improving emotional, cognitive, or motivational processes, increasing behavioral competencies, or altering the social conditions under which people live and work. In school, for example, teachers have the challenge of improving the academic learning and confidence of the students in their charge.

Using social cognitive theory as a framework, teachers can work to improve their students' emotional states and to correct their faulty self-beliefs and habits of thinking (personal factors), improve their academic skills and self-regulatory practices (behavior), and alter the school and classroom structures that may work to undermine student success (environmental factors).

#### **2.4.2 Self-Efficacy Beliefs**

The assumption that children's self-beliefs are inextricably tied to their thinking and functioning seems so sound, so obvious, and so commonsensical one might well think that research on academic motivation and achievement (research on why students do the things they do in school and why they achieve or fail to achieve) should naturally focus, at least in great part, on the things that

children come to believe about themselves. In other words, one would think that, if psychologists are interested in understanding the reasons why students select some activities and avoid others, why they succeed in some academic pursuits and fail at others, or why they are filled with either anticipation or panic at the thought of doing this or that task, then researchers should quite carefully investigate the things and ways that students believe about themselves.

Self-Efficacy Beliefs (SEB) stands at the core of Social Cognitive Theory (SCT) and affect human functioning. SEB provide the foundation for human motivation, well-being, and personal accomplishment, therefore they can best be defined as “people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances” Bandura, (1977a: 391).

Fueled by the eloquent arguments of humanist theorists, during the 1960s and 1970s there was an enthusiastic renaissance of interest in internal and intrinsic motivating forces and affective processes, particularly with reference to the dynamic importance of the self.

### **2.4.3 Defining and Measuring Self-efficacy Beliefs**

The theory of self-efficacy, as presented by Bandura (1977a), was outlined as a theoretical framework “in which the concept of *self-efficacy* is assigned a central role, for analyzing changes achieved in fearful and avoidant behavior” Bandura, (1977a:193). The theory was based on the principle assumption that “psychological procedures, whatever their form, serve as a means of creating and strengthening expectations of personal efficacy” Bandura, (1977a:193). The theory distinguishes between expectations of efficacy and response-outcome expectancies. *Outcome* expectancy is “a person’s estimate that a given behavior will lead to certain outcomes” Bandura, (1977a:193). An *efficacy* expectation is “the conviction that one can successfully execute the behavior required to produce the outcomes” Bandura, (1977a:193). Although a person may expect a

certain activity to lead to a particular outcome, they may lack the motivation to perform the action, doubting their ability to do so.

Outcome and efficacy expectations are differentiated, because individuals can believe that a particular course of action will produce certain outcomes, but if they entertain serious doubts about whether they can perform the necessary activities such information does not influence their behavior. Bandura, (1977a:193). Self-efficacy typically comes into play when there is an actual or perceived threat to one's personal safety, or one's ability to deal with potentially aversive events (Bandura, 1983). Increasing a person's self-efficacy increases their ability to deal with a potentially aversive situation. Bandura (1994a:2) defined self-efficacy as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives".

#### **2.4.4 Sources and Characteristics of Self-efficacy**

Although a wide variety of factors contribute to the development of SEB, Bandura (1977a, pp. 191, 195-200; 1994a, pp. 2-3) described four main sources of influence by which a person's self-efficacy is developed and maintained. In General, the four principal sources of self-efficacy beliefs are: Enactive mastery experiences, Vicarious experiences (comparisons), Verbal persuasions and allied types of social influences and Physiological and affective states.

##### **2.4.4.1 Enactive Mastery Experience**

Is the most influential source of efficacy information because it provides the most authentic evidence of whether one can master what it takes to succeed in:

- a. Successes build a robust sense of efficacy. Failures undermine it, especially if failures occur before a sense of efficacy is firmly established.
- b. A resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort.

Although success usually increases efficacy beliefs and repeated failures usually lower them, the impact of performance attainments on efficacy beliefs depends on what is made of those performances.

Individuals form their self-efficacy beliefs by interpreting information primarily from four sources. The most influential source is the interpreted result of one's previous performance, or mastery experience. Individuals engage in tasks and activities, interpret the results of their actions, use the interpretations to develop beliefs about their capability to engage in subsequent tasks or activities, and act in concert with the beliefs created. Typically, outcomes interpreted as successful raise self-efficacy; those interpreted as failures lower it. Of course, people who possess a low sense of efficacy often discount their successes rather than change their self-belief. Even after individuals achieve success through dogged effort, some continue to doubt their efficacy to mount a similar effort.

Consequently, mastery experiences are only raw data, and many factors influence how such information is cognitively processed and affects an individual's self-appraisal. Mastery experiences, or personal performance accomplishments, are the most effective way to create a strong sense of efficacy. "Successes build a robust belief in one's personal efficacy. Failures undermined it, especially if failures occur before a sense of efficacy is firmly established" (Bandura, 1994a:2).

#### **2.4.4.2 Vicarious Experiences (comparisons)**

In addition to interpreting the results of their actions, people form their self-efficacy beliefs through the vicarious experience of observing others perform tasks. This source of information is weaker than mastery experience in helping create self-efficacy beliefs, but when people are uncertain about their own abilities or when they have limited prior experience, they become more sensitive to it. The effects of modeling are particularly relevant in this context, especially when the individual has little prior experience with the task. Even experienced and self-efficacious individuals, however, will raise their self-efficacy even

higher if models teach them better ways of doing things. Vicarious experience is particularly powerful when observers see similarities in some attribute and then assume that the model's performance is diagnostic of their own capability. For example, a girl will raise her perceived physical efficacy on seeing a woman model exhibit physical strength but not after seeing a male model do so. In this case, gender is the attribute for assumed similarity. Observing the successes of such models contributes to the observers' beliefs about their own capabilities ("If they can do it, so can I!").

Conversely, watching models with perceived similar attributes fail can undermine the observers' beliefs about their own capability to succeed. When people perceive the model's attributes as highly divergent from their own, the influence of vicarious experience is greatly minimized. It bears noting that people seek out models that possess qualities they admire and capabilities to which they aspire. A significant model in one's life can help instill self-beliefs that will influence the course and direction that life will take. The most important factor that determines the strength of influence of an observed success or failure on one's own self-efficacy is the degree of similarity between the observer and the model

#### **2.4.4.3 Verbal Persuasions**

Individuals also create and develop self-efficacy beliefs as a result of the social persuasions they receive from others. These persuasions can involve exposure to the verbal judgments that others provide. Persuaders play an important part in the development of an individual's self-beliefs.

Effective persuaders must cultivate people's beliefs in their capabilities while at the same time ensuring that the envisioned success is attainable. And, just as positive persuasions may work to encourage and empower, negative persuasions can work to defeat and weaken self-efficacy beliefs. In fact, it is usually easier to weaken self-efficacy beliefs through negative appraisals than to strengthen such beliefs through positive encouragement. Verbal or social

persuasion also affects one's perception of self-efficacy. It is "a way of strengthening people's beliefs that they have what it takes to succeed" Bandura, (1994a:3). Unfortunately, "it is more difficult to instill high beliefs of personal efficacy by social persuasion alone than to undermine it [since] unrealistic boosts in efficacy are quickly disconfirmed by disappointing results of one's efforts".

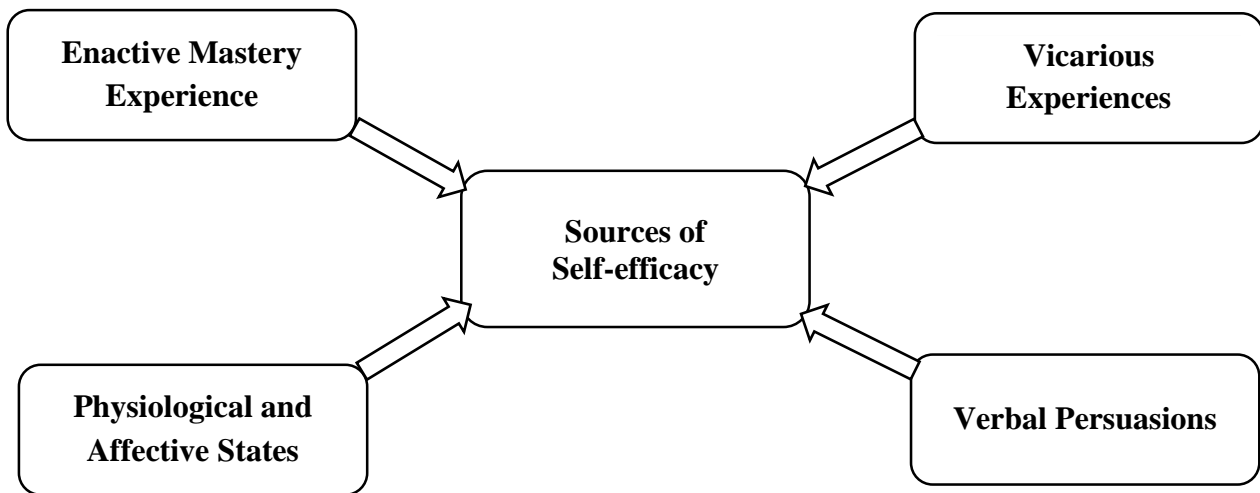
#### **2.4.4.4 Physiological and Affective States**

Somatic and emotional states such as anxiety, stress, arousal, and mood states also provide information about efficacy beliefs. People can gauge their degree of confidence by the emotional state they experience as they contemplate an action. Strong emotional reactions to a task provide cues about the anticipated success or failure of the outcome. When they experience negative thoughts and fears about their capabilities, those affective reactions can themselves lower self-efficacy perceptions and trigger additional stress and agitation that help ensure the inadequate performance they fear.

Of course, judgments of self-efficacy from somatic and emotional states are not necessarily linked to task cues. Individuals in a depressed mood lower their efficacy independent of task cues. One way to raise self-efficacy beliefs is to improve physical and emotional well-being and reduce negative emotional states. Because individuals have the capability to alter their own thinking and feeling, enhanced self-efficacy beliefs can, in turn, powerfully influence the physiological states themselves.

As Bandura (1997) has observed, people live in psychic environments that are primarily of their own making. As portrayed by Bandura below the following diagram summarizes the four principal sources of self-efficacy information, Bandura, (1977a:191, 195-200).

Diagram (2:3) Principal Sources of Self-efficacy Information



#### **2.4.5 Role of Self-efficacy in Human Functioning**

Bandura's (1997:2) key contentions as regards the role of self-efficacy beliefs in human functioning is that "people's level of motivation, affective states, and actions are based more on what they believe than on what is objectively true". For this reason, how people behave can often be better predicted by the beliefs they hold about their capabilities than by what they are actually capable of accomplishing, for these self-efficacy perceptions help determine what individuals do with the knowledge and skills they have. This helps explain why people's behaviors are sometimes disjoined from their actual capabilities and why their behavior may differ widely even when they have similar knowledge and skills.

#### **2.4.6 Influence of SEB in Human Attainment**

Since Bandura first introduced the construct of self-efficacy in 1977, researchers have been very successful in demonstrating that individuals' self-efficacy beliefs powerfully influence their attainments in diverse fields. In his 1997 book, *Self-Efficacy: The Exercise of Control*, Bandura set forth the tenets of his theory of self-efficacy and its applications to fields as diverse as life-course development, education, health, psychopathology, athletics, business, and international affairs. In this volume, Bandura also further situated self-efficacy

within a social cognitive theory of personal and collective agency that operates in concert with other socio-cognitive factors in regulating human well-being and attainment. He also addressed the major facets of agency—the nature and structure of self-efficacy beliefs, their origins and effects, the processes through which such self-beliefs operate, and the modes by which they can be created and strengthened. In addition, Bandura reviewed a vast body of research on each of these aspects of agency in diverse applications of the theory. A search for the term “self-efficacy” in most academic databases reveals that, by the year 2000, over 2500 articles had been written on this important psychological construct.

### **2.4.7 Impact of PSE in Cognitive Development**

People make casual contributions to their own functioning through mechanisms of personal agency. Among the mechanisms of agency, none is more central or pervasive than people’s beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives. Bandura (1993:118) argued that “Efficacy beliefs influence how people feel, think, motivate themselves, and behave.”

Much research has been conducted on the four major psychological processes through which self-beliefs of efficacy produce these diverse effects on human functioning. These processes include cognitive, motivational, affective and selection processes. In other words they are termed Efficacy-Activated Processes.

#### **2.4.7.1 Cognitive Processes**

The effects of self-efficacy beliefs on cognitive processes take a variety of forms. Much human behavior is regulated by forethought embodying valued goals. Personal goal setting is influenced by self-appraisal of capabilities. The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them. Moreover, personal accomplishments require not only the skills but also the beliefs of efficacy to use



them well. A major function of thought is to enable people to predict events and to develop ways to control those that affect their lives.

#### **2.4.7.2 Motivational Processes**

Self-beliefs of efficacy play a key role in the self-regulation of motivation. People motivate themselves and guide their actions anticipatorily by the exercise of forethought. Self-efficacy beliefs influence causal attributions. People who regard themselves as highly efficacious attribute their failures to insufficient effort, those who regard themselves as inefficacious attribute their failures to low ability. Causal attributions affect motivation, performance and affective reactions mainly through beliefs of self-efficacy. As Bandura (1993:131) assured that: “Self-efficacy beliefs contribute to motivation in several ways: They determine the goals people set for themselves, how much effort they expend; how long they persevere in the face of difficulties, and their resilience to failures.” .

#### **2.4.7.3 Affective Processes**

People’s beliefs in their capabilities affect how much stress and depression they experience in difficult situations and level of motivation. Perceived self-efficacy to exercise control over stressors plays a central role in anxiety arousal. Perceived self-efficacy to control thought processes is a key factor in regulating thought produced stress and depression. Once people develop a resilient sense of efficacy they can withstand difficulties and adversities without adverse effects.

#### **2.4.7.4 Selection Processes**

People are partly the product of their environment. Therefore, beliefs of personal efficacy can shape the course lives take by influencing choice of activities and environments. People avoid activities and situations they believe exceed their coping capabilities. But they readily undertake challenging activities and select situations they judge themselves capable of handling. By the choices they make, people cultivate different competencies, interests and social networks that determine life courses. Any factor that influences choice behavior can profoundly affect the direction of personal development.

#### **2.4.8 Foundations and Theoretical Nature of Teacher's Efficacy**

Central to Bandura's (1997) framework is his concept of self-efficacy. Bandura's aspirations about self-efficacy were grand, as reflected in the title of his 1977 article "Self- Efficacy: Toward a Unifying Theory of Behavioral Change." In this seminal work, Bandura defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Self-efficacy beliefs were characterized as the major mediators for our behavior, and importantly, behavioral change. Over the last quarter century, Bandura's other works continued to develop and defend the idea that our beliefs in our abilities powerfully affect our behavior, motivation, and ultimately our success or failure (cf. Bandura, 1982, 1986, 1993, 1996, 1997).

Bandura (1997) proposed that because self-efficacy beliefs were explicitly self-referent in nature and directed toward perceived abilities given specific tasks, they were powerful predictors of behavior. The research literature has supported this proposition. Research has linked efficacy to a variety of issues such as phobias depression, and smoking behavior. Educationally, self-efficacy beliefs are related to academic performance and self-regulated learning. Most importantly, efficacy beliefs help dictate motivation.

Bandura observed: "People regulate their level and distribution of effort in accordance with the effects they expect their actions to have. As a result, their behavior is better predicted from their beliefs than from the actual consequences of their actions" (1986:129). From the social cognitive theory perspective, because human agency is mediated by our efficaciousness, self-efficacy beliefs influence our choices, our effort, our persistence when facing adversity, and our emotions (cf. Pajares, 1997). In short, self-efficacy theory is a common theme in current views of motivation (Graham and Weiner, 1996), primarily because of its predictive power and application for practically any behavioral task.

#### **2.4.9 The Importance of Teacher's Self-efficacy**

Consistent with the general formulation of self-efficacy, Tschannen-Moran and Woolfolk Hoy (2001:32) defined teacher efficacy as a teacher's "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated." The study of teacher efficacy is a little over two decades old and began with RAND researchers' evaluation of whether teachers believed they could control the reinforcement of their actions (Armor et al., 1976). This early work was founded on Rotter's (1966) locus of control theory, and it was assumed that student learning and motivation were the relevant re-enforcers of teaching action. Historically, the Bandura (1977) and Rotter (1966) traditions have influenced the study of teacher efficacy.

Unfortunately, researchers' interpretations of these theories have significantly muddied the efficacy waters as regards the theoretical formulation of teacher efficacy and the psychometric attempts to measure the construct. Tschannen-Moran, Woolfolk Hoy, and Hoy (2001:33) provided a comprehensive review of these historical developments of self-efficacy measurement scale. In spite of the measurement confusion, teacher efficacy still emerged as a worthy variable in educational research. As Woolfolk and Hoy (1990) noted, "Researchers have found few consistent relationships between characteristics of teachers and the behavior or learning of students. Teachers' sense of efficacy . . . is an exception to this general rule" (P: 81). The idea that teachers' self-beliefs are determinants of teaching behavior is a simple, yet powerful idea.

The correlates of teacher efficacy are many when using a variety of efficacy scales and measurements. Students of efficacious teachers generally have outperformed students in other classes. Teacher efficacy was predictive of achievement on the Iowa Test of Basic Skills the Canadian Achievement Tests, and the Ontario Assessment Instrument Pool. Watson (1991) observed greater achievement in rural, urban, majority Black, and majority White schools for

students of efficacious teachers. Teacher efficacy is also related to students' own sense of efficacy and student motivation.

Regarding teacher behaviors, efficacious teachers persist with struggling students and criticize less after incorrect student answers (Gibson and Dembo, 1984). They are more likely to agree that a low SES student should be placed in a regular education setting and less likely to refer students for special education (Meijer and Foster, 1988; Podell and Soodak, 1993; Soodak and Podell, 1993). Teachers with high efficacy tend to experiment with methods of instruction, seek improved teaching methods, and experiment with instructional materials (Allinder, 1994; Guskey, 1988; Stein and Wang, 1988).

Clearly the study of teacher efficacy has borne much fruit. However, teacher efficacy is the subject of current debate concerning its meaning and measure (cf. Tschannen-Moran et al., 1998). The dialogue has centered on two issues. First, based on the theoretical nature of the self-efficacy construct as defined by Bandura (1977, 1997), researchers have argued that self-efficacy is most appropriately measured within context regarding specific behaviors (Pajares, 1996). Second, the construct validity of scores from the primary instruments purporting to measure teacher efficacy has been severely questioned. Accordingly, teacher efficacy is presently on the precipice of inquiry; it is ready to either move forward or fall to the wayside as a good idea that ultimately had little substance. As Tschannen-Moran et al. (1998) noted:

This appealing idea, that teachers' beliefs about their own capacities as teachers somehow matter, enjoyed a celebrated childhood, producing compelling findings in almost every study, but it has also struggled through the difficult, if inevitable, identity crisis of adolescence . . . teacher efficacy [now] stands on the verge of maturity. . . (p. 202)

#### **2.4.10 Teacher's Sense of Efficacy Scales**

Teacher efficacy has proved to be powerfully related to many meaningful educational outcomes such as teachers' persistence, enthusiasm, commitment and instructional behavior, as well as student outcomes such as achievement (Armor et al., 1976; Ashton and Webb, 1986; Moore and Esselman, 1992; Ross, 1992), motivation (Midgley, Feldlaufer, and Eccles, 1989), and students' own sense of efficacy (Anderson, Greene, and Loewen, 1988). However, persistent measurement problems have plagued those who have sought to study teacher efficacy.

In addition, teachers' efficacy beliefs also relate to their behavior in the classroom. Efficacy affects the effort they invest in teaching, the goals they set, and their level of aspiration. Teachers with a strong sense of efficacy tend to exhibit greater levels of planning and organization (Allinder, 1994). They also are more open to new ideas and are more willing to experiment with new methods to better meet the needs of their students. Clearly the study of this construct has borne much fruit in the field of education. And yet researchers have had difficulty developing a measurement tool to capture it. That is why; there are a variety of problems with existing measures of teacher efficacy.

#### **2.4.11 A first attempt at Measurement: Rotter's Locus of Control**

The search for ways to measure teacher efficacy has not suffered from a lack of effort. In the attempt to capture the meaning of this apparently powerful construct, researchers have tried both long, detailed measures and short, general ones. The first measures were grounded in Rotter's social learning theory.

##### **2.4.11.1 The Rand Measure**

The simple idea that teachers' perceptions of their own capabilities are important began with a simple measure-just two items. These two items were buried in an otherwise extensive questionnaire, and yet they turned out to be among the most powerful factors examined by Rand researchers in their study of

teacher characteristics and student learning (Armor et al., 1976). With the work of Rotter (1966) as a theoretical base, the Rand researchers conceived teacher efficacy as the extent to which teachers believed that they could control the reinforcement of their actions, that is, whether control of reinforcement lay within them or in the environment. Teachers who concur that the influence of the environment overwhelms a teacher's ability to have an impact on a student's learning exhibit a belief that reinforcement of their teaching efforts lies outside their control or is *external* to them. Teachers who express confidence in their ability to teach difficult or unmotivated students evidence a belief that reinforcement of teaching activities lies within the teacher's control or is *internal*.

- a. Rand item 1. *“When it comes right down to it, a teacher really can't do much because most of a student's motivation and performance depends on his or her home environment.”*

A teacher who expresses strong agreement with this statement indicates that environmental factors overwhelm any power that teachers can exert in schools. This assessment extends beyond the individual capabilities of the particular teacher to teachers in general. Factors such as the value placed on education at home; the conflict, violence, or substance abuse in the home or community; the social and economic realities concerning class, race, and gender; and the physiological, emotional and cognitive needs of a particular child all have a very real impact on a student's motivation and performance in school. Teachers' beliefs about the power of these external factors compared to the influence of teachers and schools have since been labeled *general teaching efficacy* (GTE) (Ashton, Olejnik, Crocker, and McAuliffe, 1982).

- b. Rand item 2. *“If I really try hard, I can get through to even the most difficult or unmotivated students.”*

Teachers who agree with this statement indicate confidence in their abilities as teachers to overcome factors that could make learning difficult for a student. The teachers are making a statement about the efficacy of their own

teaching, reflecting confidence that they have adequate training or experience to develop strategies for overcoming obstacles to student learning. These teachers may well have experienced past success in boosting students' achievement. This aspect of efficacy has been labeled *personal teaching efficacy* (PTE); it is more specific and individual than a belief about what teachers in general can accomplish. Spurred on by the success of the Rand studies, several researchers sought to expand and refine the notion of teacher efficacy, developing measures they hoped would capture more of this powerful construct. Researchers were concerned about the reliability of the two-item scale and attempted to develop longer, more comprehensive measures.

#### 2.4.11.2 Responsibility for Student Achievement

Shortly after the first Rand study was published, Guskey developed a 30-item instrument measuring Responsibility for Student Achievement (RSA), (Guskey, 1981). When Guskey (1982, 1988) compared scores from the RSA with teacher efficacy (TE) as measured by the sum of the two Rand items, he found significant positive correlations between teacher efficacy and responsibility for both student success and student failure. Data for the table below is recited from Guskey, (1981:215).

Table (2:2) Responsibility for student achievement

<p><b>Format:</b> Participants are asked to give a weight or percent to each of the two choices.</p> <p><b>Scoring:</b> A global measure of responsibility, with two subscales: Responsibility for student success (R+) and Responsibility for student failure (R-)</p>	<p><b>Sample Items:</b></p> <p>If a student does well in your class, would it probably be</p> <p>a) because that student had the natural ability to do well, or</p> <p>b) Because of the encouragement you offered?</p> <p>When your students seem to have difficulty learning something, is it usually</p> <p>a) because you are not willing to really work at it, or</p> <p>b) Because you weren't able to make it interesting for them?</p>
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### 2.4.11.3 Teacher Locus of Control

At the same time that Guskey developed the RSA, Rose and Medway (1981) proposed a 28- item measure called the teacher locus of control (TLC) in which teachers were asked to assign responsibility for student successes or failures by choosing between two competing explanations for the situations described. Half the items on the TLC described situations of student success and the other half described student failure. Scores on the TLC have been weakly but significantly related to the individual Rand items (GTE and PTE) as well as to the sum of the two Rand items (TE). Data is attained from (Rose and Medway, 1981).

Table (2:3) Teacher Locus of Control

<p><b>Format:</b> 28 items with a forced choice format.</p> <p><b>Scoring:</b> Half of the items describe situations of student success (I+) and half describe student failure (I-).</p>	<p><b>Sample Items:</b> Suppose you are teaching a student a particular concept in English grammar and the student has trouble learning it. Would this happen a) because the student wasn't able to understand it, or b) Because you couldn't explain it very well? If the students in your class perform better than they usually do on a test, would this happen a) because the students studied a lot for the test, or b) Because you did a good job of teaching the subject area?</p>
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### 2.4.12 A Second Conceptual Strand: Bandura's Social Cognitive Theory

While one strand of research grounded in Rotter's social learning theory developed, a second strand emerged, growing out of Bandura's social cognitive theory and his construct of self-efficacy, as initially described in his 1977 article,



“Self-efficacy: Toward a unifying theory of behavioral change”. Moreover, Self-efficacy is a future-oriented belief about the level of competence a person expects he or she will display in a given situation. Self-efficacy beliefs influence thought patterns and emotions that enable actions in which people expend substantial effort in pursuit of goals, persist in the face of adversity, rebound from temporary setbacks, and exercise some control over events that affect their lives (Bandura, 1986, 1993, 1997). Social cognitive theory proposes a second kind of expectation, *outcome expectancy*, which is distinct from efficacy expectations. An efficacy expectation is the individual’s conviction that he or she can orchestrate the necessary actions to perform a given task, while outcome expectancy is the individual’s estimate of the likely consequences of performing that task at the expected level of competence (Bandura, 1986). Additionally, Bandura asserted that because they stem from the projected level of competence a person expects to bring to a given situation, outcome expectancies add little to the predictive power of efficacy measures. However, outcome expectancies, in the form of physical or social rewards, recognitions, punishments, criticisms, or self-evaluations can provide incentives and disincentives for a given behavior (Bandura, 1986, 1997).

#### **2.4.12.1 The Ashton Vignettes**

In order to address the assumption that teacher efficacy is context specific, Ashton and her colleagues (Ashton, Buhr, and Crocker, 1984) developed a series of vignettes describing situations a teacher might encounter and asking teachers to make judgments as to their effectiveness in handling the situation. The researchers tested two frames of reference for judgments. The first asked teachers to judge how they would perform in the described situation on a scale from “extremely ineffective” to “extremely effective”. The second version asked teachers to make a comparison to other teachers, from “much less effective than most teachers” to “much more effective than most teachers”. The norm-referenced vignettes in which teachers compared themselves to other teachers

were significantly correlated with the Rand items but the self-referenced vignettes, rating effectiveness or ineffectiveness, were not (Ashton et al., 1984; Ashton and Webb, 1986).

Table (2:4) Ashton Vignettes

<p><b>Format:</b> 50 items describing problem situations concerning various dimensions of teaching, including motivation, discipline, academic instruction, planning, evaluation, and work with parents.</p> <p><b>Self-referenced:</b> “extremely ineffective” to “extremely effective.” <b>Norm-referenced:</b> “Much less effective than most teachers” to “much more effective than other teachers.”</p>	<p><b>Sample Items:</b></p> <p>Your school district has adopted a self-paced instructional program for remedial students in your area. How effective would you be in keeping a group of remedial students on task and engaged in meaningful learning while using these materials?</p> <p>A small group of students is constantly whispering, passing notes and ignoring class activities. Their academic performance on tests and homework is adequate and sometimes even good. Their classroom performance, however, is irritating and disruptive. How effective would you be in eliminating their disruptive behavior?</p>
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(Ashton et al., 1986)

#### 2.4.12.2 Gibson and Dembo’s Teacher Efficacy Scale

The early 1980s was a fertile time for attempts to measure teacher efficacy. It was in those years that Gibson and Dembo developed the Teacher Efficacy Scale (TES) building on the formulations of the Rand studies, but bringing to bear the conceptual underpinnings of Bandura as well. Beginning with teacher interviews and analyses of previous studies of teachers reported to have a strong sense of efficacy, Gibson and Dembo (1984) developed a 30-item measure of

teacher efficacy. Perplexed when factor analysis of the items yielded a two-factor structure, Gibson and Dembo assumed that the two factors reflected the two expectancies of Bandura’s social cognitive theory: *self-efficacy* and *outcome expectancy*. Consequently, Gibson and Dembo called the first factor *personal teaching efficacy* (PTE) assuming that it reflected self-efficacy, and the second they called *teaching efficacy* (GTE) assuming that it captured outcome expectancy.

When the Rand items were included in the factor analysis with the Gibson and Dembo measure, Rand 1 (when it comes right down to it, a teacher really can’t do much because most of a student’s motivation and performance depends on his or her home environment) usually loaded on the GTE factor and Rand 2 (if I really try hard, I can get through to even the most difficult or unmotivated students) usually loaded on the PTE factor (Coladarci, 1992; Woolfolk and Hoy, 1990).

Table (2:5) Teacher Efficacy Scale

<p><b>Format:</b> 30 items on a 6-point Likert scale from strongly disagree to strongly agree.</p> <p><b>Scoring:</b> A global measure of teacher efficacy derived from the sum of all items. Two subscales emerge from factor analysis: personal teaching efficacy and general teaching efficacy.</p>	<p><b>Sample Items:</b> When a student gets a better grade than he usually gets, it is usually because I found better ways of teaching. The hours in my class have little influence on students compared to the influence of their home environment. If a student masters a new math concept quickly, this might be because I knew the necessary steps in teaching that concept.</p>
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#### 2.4.12.3 Bandura’s Teacher Self-efficacy Scale

In the midst of the confusion about how to best measure teacher efficacy, a measure used by Bandura in his work on teacher efficacy has begun quietly circulating among researchers. Bandura (1997) pointed out that teachers’ sense

of efficacy is not necessarily uniform across the many different types of tasks teachers are asked to perform, or across different subject matter. In response, he constructed a 30-item instrument with seven subscales: efficacy to influence decision making, efficacy to influence school resources, instructional efficacy, disciplinary efficacy, efficacy to enlist parental involvement, efficacy to enlist community involvement, and efficacy to create a positive school climate. Each item is measured on a 9-point scale anchored with the notations: “nothing, very little, some influence, quite a bit, a great deal”.

The conceptual confusion around the concept of teacher efficacy has made developing appropriate measures of efficacy difficult. Researchers have tried very simple, general measures as well as long complex vignettes. None of the measures currently in use seems to have found the proper balance between specificity and generality. In addition, there are conceptual problems in the interpretation of the factor structure and the poor correlation between the factors where two or more have been found.

Table (2:6) Bandura’s Teacher Self-efficacy Scale

<p><b>Format:</b> 30 items on a 9-point scale anchored at nothing, very little, some influence, quite a bit, a great deal.</p> <p><b>7 subscales:</b> Influence on decision making, influence on school resources, instructional efficacy, disciplinary efficacy, enlisting parental involvement, enlisting community involvement, and creating a positive school climate.</p>	<p><b>Sample Items:</b></p> <p>How much can you influence the decisions that are made in your school?</p> <p>How much can you do to overcome the influence of adverse community conditions on student learning?</p> <p>How much can you do to get children to follow classroom rules?</p> <p>How much can you assist parents in helping their children do well in school?</p> <p>How much can you do to get local colleges and universities involved in working with your school?</p> <p>How much can you do to make students enjoy coming to school?</p> <p>How much can you do to get students to believe they can do well in schoolwork?</p>
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### **2.4.13 Challenges in the Measure of Teacher Efficacy**

Studies of teacher efficacy have frequently found two separate dimensions or factors, although considerable confusion and debate have arisen over their meaning. While there is general agreement that the first factor, commonly called personal teaching efficacy, has to do with one's own feelings of competence as a teacher, the meaning of the second factor has been in question. Although it is often called general teaching efficacy, some have argued for other labels.

Bandura (1986) argued that outcome expectancy is a judgment of the likely consequences of a specific action, given an individual's anticipated level of performance. Bandura pointed out that outcome expectancy adds little to the explanation of motivation because the outcome a person expects stems from that person's assessment of his or her own capabilities and expected level of performance, not from what it would be possible for others to accomplish under similar circumstances. Therefore the items used to measure the second factor of teacher efficacy about the potential impact of teachers in general in the face of external impediments (GTE) cannot be considered outcome expectancy (Tschannen- Moran et al., 1998; Woolfolk and Hoy, 1990). To capture the contingency relationship between means and ends (Skinner, 1996), items would have to refer to outcomes the individual teacher could expect; given certain actions or means he or she felt capable of delivering. Emmer and Hickman's label "external influences" strikes closer to the mark of what the current GTE items capture.

Guskey and Passaro (1994) attempted to add clarity to the meaning of these two factors of Gibson and Dembo's TES by modifying the wording of the items. They noted that all of the 11 items on the Gibson and Dembo TES that loaded on the personal teaching efficacy factor were worded positively and thus geared to an internal orientation ("I can"), whereas the items that loaded on the second factor, labeled general teaching efficacy, were negatively worded, consistently reflecting an external orientation, ("teachers can't"). When Guskey and Passaro

reworded the personal efficacy items so that half reflected an internal and half an external orientation, and did the same with the general teaching efficacy items, the results conformed to an internal/ external dichotomy rather than the personal/ general dimensions.

Guskey and Passaro concluded that:

“The internal and external distinction identified in this study more accurately represents teachers’ perceptions of the strength of different and independent factors. The internal factor appears to represent perceptions of personal influence, power, and impact in teaching and learning situations. The external factor, on the other hand, relates to perceptions of the influence, power, and impact of elements that lie outside the classroom and, hence, may be beyond the direct control of individual teachers” (p. 639).

This challenge provokes further reflection on the meaning of the two factors that have often been found in measures of teacher efficacy. These findings invite us to question once again the nature of teacher efficacy and how it can best be measured.

#### **2.4.14 Development of a New Measure of Teacher Efficacy**

Deciding how to measure teacher efficacy presents thorny issues. Bandura (1997, 2001) recommended including various levels of task demands, allowing respondents to indicate the strength of their efficacy beliefs in light of a variety of impediments or obstacles and providing a broad range of response options. But perhaps the greatest challenge has to do with finding the optimal level of specificity for measurement. Although Bandura would applaud efforts to expand measures of teacher efficacy beyond single-item measures, which often are unreliable and cannot capture multifaceted dimensions of the construct, he

nonetheless finds most currently available measures of teachers' sense of efficacy to be too general.

Pajares (1996) complained that, in relation to student self-efficacy, global measures obscure what is being measured, Omnibus tests that aim to assess general self-efficacy provide global scores that decontextualize the self-efficacy-behavior correspondence and transform self-efficacy beliefs into a generalized personality trait rather than the context-specific judgment Bandura suggests they are. The problem with such assessments is that students must generate judgments about their academic capabilities without a clear activity or task in mind. As a result, they generate the judgments by in some fashion mentally aggregating to related perceptions that they hope will be related to imagined tasks (p: 547).

On the other hand, Pajares noted that, "specificity and precision are often purchased at the expense of external validity and practical relevance" (p: 561). There is a danger of developing measures that are so specific they lose their predictive power for anything beyond the specific skills and contexts being measured.

In order to be useful and generalizable, measures of teacher efficacy need to tap teachers' assessments of their competence across the wide range of activities and tasks they are asked to perform. The Tschannen-Moran et al. (1998) model of teacher efficacy suggests that a valid measure of teacher efficacy must assess both personal competence and an analysis of the task in terms of the resources and constraints in particular teaching contexts. Most existing measures of teacher efficacy do not include both dimensions of efficacy.

For example, the first Rand item and other measures of general teaching efficacy tend to assess just the external constraints faced by teachers and not the resources, while the second Rand item and other measures of personal teaching efficacy assess teaching strengths but not personal challenges. Studies need to test the relative predictive power of assessments of personal competence and of the analysis of the task.

Certainly some context is inferred in assessments of personal competence (presumably those the person has had experience with) but a more careful and fine-grained assessment of those factors that both facilitate and impede teaching in a particular teaching context is likely to produce more powerful instruments.

After nearly a quarter of a century of work on teacher efficacy, it seems apparent that a new measure of teacher efficacy that is both reliable and valid is needed (Henson, Bennett, Sienty, and Chambers, 2000; Tschannen-Moran et al., 1998). Although Bandura's instrument addresses many of the issues of measurement he has raised, problems remain. For example, both teachers and teacher educators who examined Bandura's instrument (in a seminar described below) were concerned that the distribution of items within the seven subscales did not accurately reflect the kinds of tasks that typically make up a teacher's work life.

#### **2.4.15 Self-efficacy Instrument Development**

Work on a new measure of efficacy was undertaken by participants in a seminar on self-efficacy in teaching and learning in the College of Education at The Ohio State University. The seminar included two researchers and eight graduate students. The graduate students included two teacher educators, two full time doctoral students, and four practicing teachers. Several possible formats for a new efficacy measure were explored, including a Likert-type scale similar to the Gibson and Dembo instrument and the expanded scale advocated by Bandura. In the end, the group decided on a measure based on Bandura's scale, but with an expanded list of teacher capabilities. Each seminar member independently selected items from the Bandura scale that she or he believed represented important tasks or elements of teaching. In addition, each member generated 8–10 new items to reflect areas of teaching not represented on the Bandura Scale, such as assessment. This process produced over 100 items, though there were many overlaps and similarities among items.



All of the items were pooled and the group then discussed each item as a possible candidate for the final scale, attempting to reach consensus on each item or revise items to capture important and frequently nominated areas of teaching. Using this nomination, discussion, and revision approach, 52 items were generated to assess the full range of teaching tasks and capabilities. From Bandura's 30-item scale, 23 items were retained and 7 were discarded as not being representative of frequent activities within a teachers' work life.

The remaining 19 items generated by the group described significant tasks of teaching not represented on the Bandura scale, such as assessment, adjusting the lesson to individual student needs, dealing with learning difficulties, repairing student misconceptions, and motivating student engagement and interest. A 9-point scale was used for each item, with anchors at 1-nothing, 3-very little, 5-some influence, 7-quite a bit, and 9-a great deal. (The new measure, named the Ohio State teacher efficacy scale (OSTES).

#### **2.4.16 Implications and Directions for Future Self-efficacy Research**

The development of the OSTES is a step forward in capturing what has been an elusive construct. It is superior to previous measures of teacher efficacy in that it has a unified and stable factor structure and assesses a broad range of capabilities that teachers consider important to good teaching, without being so specific as to render it useless for comparisons of teachers across contexts, levels, and subjects. Clearly this new scale needs further testing and validation. Clarification of the meaning of teacher efficacy and the relative weight of teachers' assessments of their skills and liabilities in light of the resources and constraints they face in particular teaching contexts promises to aid both those who would study and those who train teachers.

Even in its nascent form, however, this instrument opens new possibilities for research. Because efficacy beliefs are presumed to be relatively stable once set, more information is needed as to the factors that contribute to efficacy

judgments and how efficacy beliefs are established (Hoy and Woolfolk, 1990). The following could be guiding questions that need to be answered:

- a. What are the effects of the teaching environment and context?
- b. What structural features and supports make a difference in the formation of efficacy beliefs?
- c. Could the efficacy beliefs of teachers change in response to differing principal efficacy beliefs when there is a change of leadership at the school?

Exciting possibilities lay ahead as we learn more about this simple yet powerful idea. If the significant effects of teachers' beliefs in their capabilities were taken seriously, it could provoke significant changes in the way teachers were prepared and supported in their early years in the profession. Teacher preparation programs could come to look more like apprenticeships, with a gradual shift from the vicarious experience and verbal persuasion of a university classroom to more mastery teaching experiences throughout the program, with steadily increasing levels of complexity and responsibility. There would be a gradual withdrawing of scaffolding and supports rather than the sink-or-swim practicum experiences many novice teachers now experience.

Taking seriously the potency of efficacy beliefs to impact teacher motivation and persistence over the course of a career could also well lead to a rethinking of the induction-year experiences of novice teachers, allowing for greater protection and support. The norms of teaching have often treated class assignments as rewards for status and seniority. In this kind of system, new teachers are given the least-desirable and most challenging teaching assignments to signify their position at the bottom of the status hierarchy. However, from an efficacy perspective this is a dysfunctional practice as it can lead novice teachers to adopt a low sense of efficacy that, unless reassessed by a significant change

later, could result in decreased effort and enthusiasm for teaching for the length of one's teaching career.

Finally, the professional development of teachers would be structured as powerful mastery experiences with an eye toward helping teachers garner evidence of improved learning on the part of their students in order to reap the efficacy pay-off that would result.

#### **2.4.17 Areas of Inquiry in the Advancement of Teacher Efficacy**

Recent developments in the study of teacher efficacy beg many questions regarding the function of teacher efficacy in teachers' lives. Although myriad research agendas could be developed to pursue these questions, the following represents three areas of inquiry that show great promise for the advancement of teacher efficacy. Other treatments of these and related issues can be found in Goddard et al. (2000), Tschannen-Moran and Woolfolk Hoy (in press), Tschannen-Moran et al. (1998).

##### **2.4.17.1 Efficacy Building Information**

Bandura (1986:411) argued that "perceived self-efficacy results from diverse sources of information conveyed vicariously and through social evaluation, as well as through direct experience". Furthermore, these source of information "must be processed and weighed through self-referent thought" (p: 21). Accordingly, Bandura (1986, 1997) postulated four sources of efficacy building information: mastery experiences, vicarious experiences, social persuasion, and physiological or emotional arousal. Tschannen-Moran et al. (1998) employed these sources of information in their theoretical model of teacher efficacy. Mastery experiences are considered the most powerful influence on efficacy as they provide direct feedback regarding capabilities. However, because the feedback "must be processed and weighed through self-referent thought," all success does not lead to bolstered efficacy. Attributional analysis and causal assumptions concerning outcomes impact the interpretation of mastery experiences. Furthermore, some outcomes may be valued more than others. For

example, a teacher may succeed at altering an assignment to the appropriate level of a student, but experience no increase in confidence because no special value was vested in the outcome. Social cognitive theory emphasizes that vicarious experiences can impact learning and efficacy.

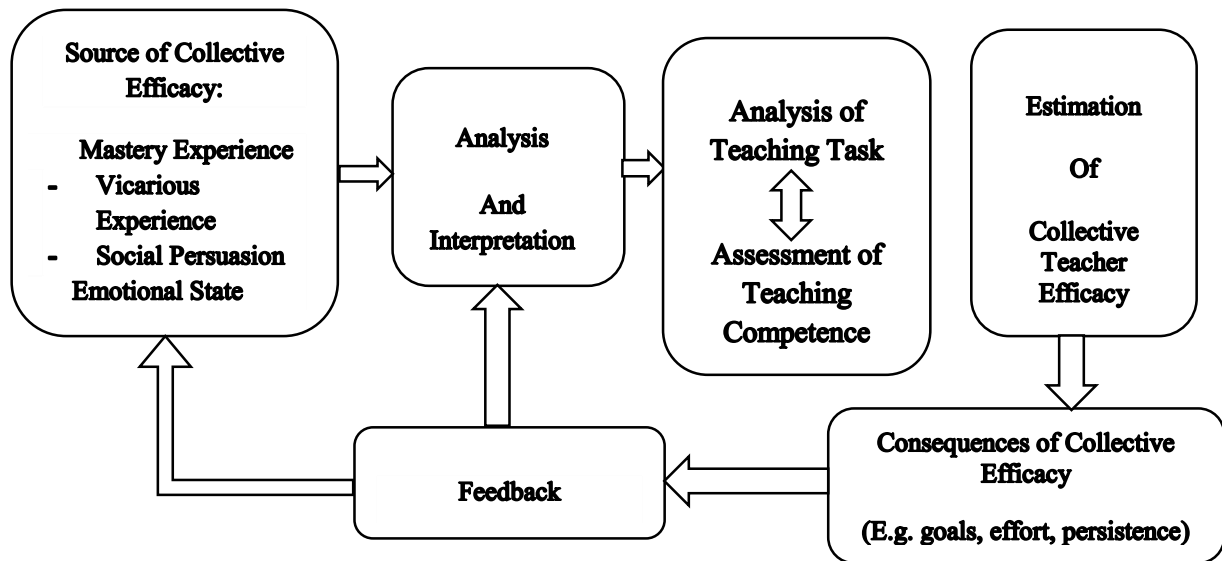
Social persuasion and the emotional state that one experiences during social interactions can also bolster, or weaken, self-efficacy beliefs. Although the Tschannen-Moran et al. (1998) included these elements in their model, research examining the validity and potential impact of the sources of information on teacher efficacy is practically non-existent. If teacher efficacy is the powerful predictive construct it has been thought to be, then research examining the processes by which such efficacy is built is critical to fostering teacher efficacy and, ultimately, changing behavior.

#### **2.4.17.2 Collective Teacher Efficacy**

Recently some researchers have begun to explore the construct of collective teacher efficacy. Because social cognitive theory holds that “personal agency operates within a broad network of socio-structural influences” Bandura, (1997:6) the theory “extends the analysis of mechanisms of human agency to the exercise of collective agency” (p: 7). Bandura (1997:477) defined collective efficacy generally as “the groups’ shared belief in its conjoint capabilities to organize and execute courses of action required to produce given levels of attainments”.

Collective efficacy takes self-efficacy to the social level. Goddard et al. (2000:486) defined collective teacher efficacy as a construct measuring teachers’ beliefs about the collective (not individual) capability of a faculty to influence student achievement; it refers to the perceptions of teachers that the efforts of the faculty of a school will have a positive effect on student achievement.

Diagram (2:4) Simplified Model for Collective Teacher Efficacy



In the same line of research, Goddard, Hoy, and Hoy (2000, 2004) have explored *collective* teacher efficacy or the perceptions of teachers in a school and the efforts the faculty as a whole will have a positive effect on students. Their model is reproduced here as the above diagram. This construct is associated with teachers' effort, persistence, shared thoughts, stress levels, and achievement of groups. These authors draw on the work of Bandura (1986, 1997) in identifying sources of collective efficacy information: mastery experience, vicarious experience, social persuasion, and emotional arousal, with mastery experiences being the most powerful force. Furthermore, they propose that analysis of the teaching task and assessment of teaching competence also contribute to the development of collective teaching efficacy (Goddard *et al.*, 2000).

#### 2.4.18 Impact of Teacher Efficacy Change

Given the current and potential educational value of the teacher efficacy construct, efforts to impact changes in teacher efficacy would be valuable in moving teacher efficacy research beyond the realm of correlational designs. Little experimental or long-term intervention research has been conducted in this

area. As Ross (1994) noted, “In the absence of interventions it is difficult to tell whether teacher efficacy is a cause or a consequence of the adoption of more powerful teaching techniques” (p. 382). The limited number of studies in this area does suggest that teacher efficacy can be impacted by meaningful, active interventions. Bandura, (1997:82) cautioned that positive changes in self-efficacy only come through “compelling feedback that forcefully disrupts the preexisting disbelief in one’s capabilities”.

Although there is consistent evidence that efficacy is most malleable in the pre-service years, efficacy tends to be resistant to change for experienced teachers (Tschannen-Moran et al., 1998). For example, it is found that general teaching efficacy increased after eight month training on cooperative learning. Personal teaching efficacy, however, was stable across time. Personal teaching efficacy appears to be particularly difficult to impact in experienced teachers since it is an internally held belief about oneself that solidifies with experience and time. As such, positively impacting teachers’ efficacy beliefs is unlikely outside of longer-term professional development that compels teachers to think critically about their classrooms and behave actively in instructional improvement. These professional development opportunities come in many forms. However, one particularly promising approach is via participatory teacher research, which has been suggested as one means of fostering meaningful professional development for teachers. Participatory teacher research is a collaborative process by which teachers themselves critically examine their classrooms, develop and implement educational interventions, and evaluate the effectiveness of those interventions. These activities allow teachers to actively participate in the development of practical knowledge about teaching. Teacher research models capitalize on critical thought and data-based action; social cognitive theory upholds such human agency as foundational to self- efficacy growth (Bandura, 1997). Current evidence suggests that teacher efficacy is indeed malleable, but that change will likely occur only via engaging and meaningful professional development

opportunities, particularly activities such as teacher research initiatives that capitalize on teachers' critical thought and human agency.

In Conclusion; Teacher efficacy research is roughly a third of a century old now. Early work suggested powerful effects from the simple idea that a teacher's beliefs in his or her ability to positively impact student learning are critical in actual success for failure in a teacher's behavior. These beliefs, called teacher self-efficacy, can be explained in Bandura's (1977) social cognitive theory, which emphasizes human agency within a multi-directional model that influences our thoughts and behaviors. The study of teacher efficacy has suffered from poor construct validity issues. Relatedly, it has also suffered from foreclosure on instrument development before sufficient validation of scores across studies was evidenced. Recently however, there have been several important advances in the field on both substantive and measurement grounds. The teacher efficacy construct has undergone serious scrutiny and new theoretical models have emerged. Several promising instruments have been developed.

## **2.5 Previous Studies**

Researches on the incorporation of ICT in teaching and learning English as a foreign language increased intensely in the last few years. Unfortunately, none of these researches expanded the limits to include the prospective role of ICT to develop the self-efficacy of EFL students. The following section reviews previous researches and studies that are related to the present study.

Hashim Abdelgadir Elbakhit Ahmed carried this study in 2015, under the title (Role of ICT in Enhancing the Performance of the Teaching Staff in Higher Institutions in Sudan University - Bahri as A Case study). The study was conducted at the Faculty of Education University of Bahri- Sudan. The researcher aimed at finding out (a) the real situation of ICT use in the higher institutions in Sudan, (b) explore solutions to overcome challenges of ICT use and (c) come up with specific recommendations that can be generalized to all universities all over the country in regard to ICT use. The researcher used structured questionnaire to

survey a number of (74) of teaching staff representing eight faculties at University of Bahri – Sudan. The findings of this study revealed that teaching staff had a strong willingness to integrate ICT into teaching-learning processes. The innovations that ICT has brought in teaching and learning process come through presentation via computer, video conference, social networks, e-courses, internet, email to communicate with students. The researcher attributed this to the existence of all these media-aided tools that increased the opportunity to excellent practice of teaching-learning process and the transformation of positive attitudes towards ICT into effective practices.

Negla Ahmed Albasheer Osman carried out this study in 2014 under the title (The acceptance and use of information and communication technologies by staff members in Khartoum state's universities (Sudan). The study was carried out at the Technology Department Faculty of Education Dresden University of Technology. The researcher investigated the acceptance and use of Information and Communication Technologies, and examined factors that influence and predict acceptance and use of ICTs among Staff Members (SMs) of Khartoum State Universities. The researcher came out with the results that, ICT is widely used by most SMs. However, relatively low numbers of SMs used ICTs in teaching. Perceived usefulness (PU) and SMs' intrinsic motivation were the main reasons that motivated SMs to use ICTs. The researcher attributed this to a number of suggested constrains, specific infrastructure, organization, and individual level were strongly agreed on as the main problem that hinder SMs' ICT use.

Abdelrahman Mohamed Ahmed carried this study in July 2015. The title of the study is (A preliminary study of ICT's Infrastructure and Pedagogical Practices for technology Integration in Sudanese Secondary schools). The study was carried out in Sultan Qaboos University, Muscat, Oman. A sample of (50) secondary schools from Khartoum state was selected using a stratified random sampling technique. A mixed qualitative and quantitative method was used for



this study. A semi-structured questionnaire and interviews were used. The researcher investigated the status of ICT infrastructure and Innovative pedagogical practices in secondary schools in Sudan. The results indicated that Sudan does not yet have the necessary ICT infrastructure to integrate technology into education and is well behind many countries internationally in implementing ICT into education. The researcher attributed these finding based on the fact that all secondary schools teachers in Sudan had little experience with the use of ICT in teaching and learning. Furthermore, the majority of schools in Sudan use ICT for administrative purposes only; however, the use of technology across the curriculum is still at infancy stage.

Albooni, Gamar; Mohammed, Mohammadain Y.; Ezza, Elsadig Y (2013) in their paper entitled (Integration of the Internet in a Sudanese EFL Classroom), explored the integration of the web resources into the EFL classroom activities at the University of Khartoum, Sudan. The study made three predictions about the use of the Internet in the EFL classroom: (1) Most EFL teachers use web-based materials to enrich courses content. (2) Most EFL teachers integrate their students' Internet skills in the classroom activities. (3) There are no gender differences with respect to the integration of web-based materials into the EFL course content. A questionnaire was designed and distributed to (25) respondents who were randomly drawn from the total of (41) EFL faculty members who are currently in the service at the University of Khartoum. The data obtained was analyzed using SPSS.

The findings confirmed the three hypotheses. Moreover, the study found that unfortunately despite the early introduction and integration of internet service into the University of Khartoum, it has not adopted a clear policy to enforce the integration of the internet in educational system, bearing in mind that there is high level of digital literacy among its teaching staff.

Badawi, R. Hassan (2014) in his study entitled "EFL Teachers' Attitudes towards using computer Assisted language learning in classroom". The study

attempted to investigate Sudanese EFL teachers' attitudes towards using CALL, the researcher used a descriptive analytical method, the data collected from English teachers (50) working in three universities: Sudan university of science & technology, Omdurman Islamic university, and Al-Ahfad university for women through questionnaire which was analyzed through descriptive statistics SPSS. The study illustrated a positive inclination towards benefiting from computer in EFL classrooms. The results also indicate that computer use in considered highly advantageous. The study suggested that computers accessibility in classrooms is crucial so, EFL classes should be equipped with computers and teachers should have training courses in using ICT.

Kmanour, E.L (2002) in his study entitled "Developing Higher Education at Sudanese University with the utilization of instructional Technologies". The main objective of his study has arisen from the fact that higher education in the universities of Sudan being the driving force in achieving progress- for urgent development via current challenges manifest in the technology development and information explosion, taking into consideration, the growing number of students at the Sudanese universities. The main questions addressed in this study were: (1) How can the utilization of instructional technology develop and improve university education in Sudan? (2) To what extent can the instructional technologies contribute in problem solving and critical thinking. The hypotheses of this study were: (1) Teaching staff at Sudanese universities have strong positive attitudes towards solving all the problems concerned with higher education with the help of instructional technologies. (2) Using instructional technologies represented novel ways and ideal solutions for problem solving compared with traditional ways and methods. (3) Using instructional technologies have a deeper impact on improving Sudanese university education. The data was obtained, the analyzed through statistical method (SPSS).

This research has yielded a number of findings such as; (1) the utilization of instructional technologies in Sudan universities instruction lacks a definite

clear perspective; concerning the concepts of instructional technology. Despite the complete satisfaction and the firm conviction of all those who would be directly or indirectly concerned with the adaptation and the utilization of instructional technologies. (2) The study showed positive attitudes from the teaching staff towards the possibility of developing university intuition and solving its problem by using instructional technology tools. Depending on the results of the study, the researcher forwarded some suggestions and recommendation, with hope they contribute to a suitable infrastructure for developing university instruction in the Sudan.

Naser, O.N. (2005) conducted a study (The impact of information technology on the development of some of educational institutions in Sudan). The researcher aimed to find out how can teachers benefit from computer and Internet in education and to find solution for the problems of the availability of this information technology devices in Sudan. The researcher applied the descriptive analytic method. The subjects of the study consisted of the Education College students of Khartoum University, Alzaem Alazhari University, Sudan University, and Juba University. The researcher chose a random sample and some educationalists and specialists in the field from each university. It included (116) students (male and female). The questionnaire and the interview were the tools used to collect the data. The results revealed that: (1) The use of information technology contributes in educational development. (2) The trained cadre in the mentioned field are not available. (3) This technology is not available widely for institution in order to get benefit out of it. (4) Using Internet participates in solving problems of the university students, by using it in the system of distance learning.

Ahmed, H. H. (2007) conducted a study (The impact of instructional technology on teaching English in high secondary school). His study attempted to examine the impact of instructional technology on teaching English in high secondary school in Khartoum State. The study aimed at searching for the trends

of English language teachers towards the use of educational technologies in secondary schools and the impact of that upon the students' learning. The researcher used the descriptive method. A questionnaire was used as data collecting tool. The participants were teachers and directors of English language at secondary level in Khartoum State. The findings revealed that: (1) lack of the technological means. (2) Absence of practical training of English teachers to use technologies. (3) Weak concern of the Ministry of Education in directing the English language teachers towards using educational technologies in teaching English.

Ahmed, H. (2008) conducted a study (CALL History, CALL Development and the Implementing of CALL Courseware Programs on Learning English Language Skills). The study aimed to examine which technologies are used in teaching and learning of English language skills and areas such as grammar and vocabulary acquisition in Sudan. The study, also, attempted to examine the impact of CALL courseware programs in Khartoum secondary schools. The focus was on teachers' achievement in English as a foreign Language (EFL) reading, in terms of their perceptions of learning effectiveness, teacher, classroom interest and difficulty. The study compared CALL-based English class and traditional English class over four months. A group of (74) second year students from different schools were divided into two classes. Both classes were taught by the same teacher and covered the same topics in their weekly three-hour reading lessons. In addition, a written survey was administered at the end of the four months. The results revealed that most students in the CALL class showed positive response. They perceived their learning environment and they were offered many opportunities for collaboration and mutual support, as well as for exposure to, and interaction with a variety of interesting, enjoyable and useful materials and tasks. Many teachers were willing to use technology in their classes but they need training and they believe that students would be more motivated since they are far more familiar with technology than the teachers are.

Abd El Baset (2004) conducted a research under the title (The effectiveness of using PowerPoint presentation in teaching English language for second year secondary school in Karrari Locality). The aim of his research is to investigate the utilization of PowerPoint presentation in teaching English language, compared to the traditional method of teaching at secondary level in Karrari Locality- Omdurman - Sudan. Another purpose was to examine the effect of PowerPoint in immediate and delayed achievement for two groups of second year secondary school students. Ninety students were selected and divided into two groups. The experimental group and control group consisted of (45) students in each group. The experimental group was taught by teacher aided by computer, whereas, the control group was taught without the help of computer. Each group took 15 teaching hours to complete their task. The results showed that: (1) there was statistically significant difference between the means of the experimental group and control group in immediate achievement. (2) There was statistically significant differences between means of experimental group and the control group in delayed achievement, in favour to the experimental group.

Rehab Abdelsalam Elsanousi Mohammed (2017) conducted a research under the title (Digital Technologies: An Analysis of English Self- Efficacy and Active Learning Opportunities). This study investigated the use of digital technologies in Sudanese university EFL classes in order to shed light on EFL students' English self- efficacy and active learning opportunities (Karari University and Sudan University of Science and Technology). The study also aimed to find out if using digital technologies played a role in sustaining EFL student' self- directed learning and learning autonomy or not. Moreover, the study intended to examine the attitudes of Sudanese university teachers' towards using digital technologies in their EFL instruction. The study hypothesized that: (1) There are so many active learning opportunities provided by digital technologies to Sudanese university EFL students. (2) Digital technologies provide more challenges to Sudanese EFL students to be learners that are more independent.

(3) The Sudanese university EFL instructors have positive attitudes towards using digital technologies to enrich their instruction and course delivery method. The analytical and descriptive method was adopted.

Data were collected via classroom observation checklist and two questionnaires. The researcher arrived at the conclusion that digital technologies at Karari University provides EFL students with ample opportunities to practice and acquire English. Furthermore, the study found out that using digital technology has a direct impact on sustaining EFL students' direct autonomous learning. In addition, the research showed that university faculties were more likely to use digital technologies and have positive attitudes towards using digital technologies in their instruction.

Al-Hammadi (2007), in her study (The Effectiveness of Using a multi-media Software in Developing some Listening Skills among Saudi Secondary School Students), measured the effectiveness of multi-media software for developing some listening skills among EFL Saudi secondary school students. To achieve this purpose, three tools were used. Firstly, a list of listening skills was collected from literature to determine the necessary listening skills needed by third year Saudi secondary school students. Secondly, a pre/posttest was prepared and programmed to measure the effectiveness of the software in developing some listening skills. It was administered at the beginning and end of the experiment to measure students' listening skills. Thirdly, multi-media software was designed, programmed, and administered by the researcher for developing students' listening skills. The results of her study showed the following; (1) The software has proved to be effective in developing some listening skills among EFL secondary school students. (2) Superiority of students' performance in the post-test measures is due to the effective use of multimedia annotations and the variety of activities that have been used. (3) Shy or inhibited students can be greatly benefited by individualization, student-centered learning. Computer can offer new opportunities for better language learning. (4) Multimedia is a great treasure

for teachers and students because it has exactly what you need, whether it is for an activity in class or any activity out of the class.

Ibrahim Mohamed Al-Faki (2014), in his study entitled “the difficulties that teachers experience when they use the Interactive White Board IWB in English language classes” in Saudi context, the study aimed to investigate the interactive whiteboard if it is used or not, and to mention the difficulties occur when teachers use it. The study finds out while ICT presents new challenges for teachers; it also offers great opportunities for teacher education. ICT’s media can improve training through providing access to educational resources, breaking the traditional isolation of teachers, and enabling individualized training opportunities. The study revealed that there are a few research studies, which investigate the drawbacks of IWB.

Moreover, the study focused on the difficulties, which teachers faced in the classrooms in the Saudi contexts. Those difficulties are categorized into four groups. These are; teachers', school administrations', technical support's and students' factors. Each factor entails a number of challenges. The main questions addressed in his study were: (1) what computer skills do teachers have? (2) What type of professional training do teachers have in using the IWB? (3) What type of technical support do teachers have? (4) How do teachers and learners cooperate to use the IWB? (5) What problems do teachers face when they use the IWB in English language classes?

The hypotheses of his study were based on: (1) Most teachers lack computer competency. (2) There is a lack of pedagogical in-service training in using IWB. (3) Ongoing technical support is insufficient. (4) Learners know technology better than teachers do. (5) Teachers face several types of difficulties when they use the IWB in teaching English language. The data was obtained through a questionnaire consisting of twenty-five statement besides the researcher’s observation and his own experience. The subjects were chosen purposively from Jeddah Schools’ English language teachers. The researcher

conducted a pilot survey and used statistical techniques through which validity and reliability of the questionnaire were verified. The overall research method used was the descriptive analytic method. The findings of the study have revealed that there are many challenges that teachers faced when using the interactive whiteboard. Those challenges interact together to hinder IWB integration into teaching and learning.

Abdallah, A. (2013) in his study, which entitled “Effect of Using Internet Tools on Enhancing EFL Students’ Speaking Skill”, aimed to examine the effect of using shared online oral diaries on the EFL Saudi First year university students’ speaking proficiency. It used one male and one female EFL Saudi First year university student’s classroom sections to represent the experimental group and one male and one female classroom sections to represent the control group.

An equivalent speaking proficiency test, developed by the researcher, was applied on the control and the experimental groups before the study started to ensure their equivalence; and was also used as a post-test. The results of the post-test revealed significant differences between the mean scores of the experimental group and the mean scores of the control group in favor of the experimental group. The cultural random sampling method was used because it was impossible to redistribute students into new classroom sections. All of the participants were of level two in the English language proficiency placement test that the English Language Skills Department in the Preparatory Year Deanship usually run at the beginning of each academic year.

Sultan A. M. Arishi (2017) in his study entitled: “Attitudes of students at Saudi Arabia’s industrial colleges towards computer – assisted language learning (CALL). This paper identified attitudes toward CALL of students studying English as a foreign language (EFL) at industrial colleges in Saudi Arabia. Seventy students who were enrolled in the orientation year of an English program were chosen to participate in this study by expressing their attitudes toward CALL. Standardized and local instruments were used along with interviews and



observation techniques to collect data. The results of the study revealed that students had positive attitudes toward CALL. Looking at the daily hours students spend using a computer, a slight correlation was found between this variable and the students' attitudes toward CALL. Other variables, such as students' background knowledge of English, ownership of a computer, and their computer knowledge, were found to be irrelevant to their attitudes toward CALL. These results were in line with previous research conducted by Al-Shammari (2007), Alrumaih (2004), and Almekhlafi (2006). The results reinforced conclusions about CALL revealed by researchers, such as Chen (2003), Chikamatsu (2003), Egbert (2005) and Levy (2005), who found that it helps students learn better and more independently, and gives them the ability to have more control of their learning and to have more opportunities to practice English.

Al-Balawi, M, S (2007) in his thesis entitled "Critical Factors Related to the implementation of web- based instruction by higher- education faculty at the universities in the kingdom of Saudi Arabia". University of West Florida, college of professional Studies is occupied with the current use of web- based instruction (WBI) at Saudi Institutions, the facilitating, and the impending factors affecting faculty decision to participate or not in (WBI). The instrument used was a questionnaire. The purpose of his study was to investigate the attitude of the faculty members at three Saudi universities towards web- based instruction (WBI) and to provide the Saudi universities and the faculty with insight into the use of WBI. The main questions addressed were: (1) what are the attitudes of Saudi Faculty towards web- based instruction, and (2) how do the factors related to barriers influences faculty participation in web- based instruction. He concluded that, Saudi faculty has positive views about potential incentives when implementing WBI. Based on the findings of his research, he suggested a number of recommendations: (1) This study should be replicated and similar study should be conducted using additional Saudi Universities and (2) further studies should

be conducted to determine if there are other factors affecting the implementation of WBI at Saudi universities beyond those investigated in his study.

Liu, Moore, Graham and Lee (2002), ran a survey under the title (Review of literature from 1990 – 2000). In this study, they reviewed the literature on computer uses in second language and foreign language from 1990 to 2000 inclusive. Most of the literature originated in the United States; however, they included some international references. The goals of the review were (1) to understand how computers have been used in the past eleven years to support second language and foreign language learning, and (2) to explore research evidence as relates to how computer technology can enhance language skills' acquisition. Liu et al also discussed the findings of the mentioned review under the following categories: (a) potentials of computer technology and its use in specific areas, (b) software tools used in certain language skill areas, (c) software design considerations, (d) computerized language testing, and (e) research findings from studies using quantitative or qualitative methodologies.

The findings of their review showed that: (1) The benefits of Computer Assisted Language Learning (CALL) have been widely accepted and educators agree that it can be an effective instructional tool. (2) Research from 1990 to 2000 provided some evidence on the effectiveness of computer technology in second language learning. For example, the use of visual media supported vocabulary acquisition and reading comprehension and the use of online communication tools has been shown to improve writing skills in a number of studies. Their implications for future research were: (1) Research needs to have solid foundation in theories. (2) Software needs to be based upon relevant pedagogical and design principles for them to be effective. (3) Studies need to use well-established and reliable measures. (4) Research focus should go beyond anxiety, attitudes, vocabulary acquisition, and language production. (5) More research needs to be conducted in the less explored skills areas such as speaking, listening, and culture. (6) More research needs to be conducted at K-12 level.

Arkin (2003) conducted a study under the title (Teachers' attitudes towards computer technology use in vocabulary instruction). The aim of this study was to examine how teachers perceive the incorporation and use of computer technology resources in language teaching through investigation of teachers' attitudes and approaches to using an online supplementary resource in vocabulary instruction in an EFL context in Ankara-Turkey. The aim of the study was to explore the factors that affect teachers' use or non-use of the online program for teaching purposes. The study finally examined whether and to what extent opportunities, facilities, and training provided to teachers contribute to their acceptance and use of these resources. The results of the research revealed that simply introducing computer technology resources does not guarantee teachers' use of these resources in practice. The provision of training is seen as a key factor in both changing attitudes and encouraging teachers in incorporating technology into their instructions.

Nurul Atikah Abdullah, et al. (2006) conducted a study (The attitude and motivation of English language teachers towards the use of computers). The aim of the study is to clarify the level of the attitude and motivation of English language teachers in using computer for delivery of the English course and the associated problems and constraints faced by them. The study was qualitative and quantitative in nature and involved (62) English teachers from (12) schools in a selected district in Malaysia. The findings revealed that the majority of the teachers had a positive attitude; the teachers were highly motivated towards the use of computers to teach English and actually used them for teaching and learning purposes. The findings also showed that intrinsic rewards, such as responsibilities, a sense of self-worth and accomplishments played an important role in enhancing the positive attitude and motivation.

Salih Usun (2007) conducted a descriptive study (Teacher training programs for computer education and computer-assisted education in Turkey). The study reviewed the applications and problems on teacher training programs

for computer education and computer assisted education (CAE) in Turkey. According to the findings of many studies in the related literature, pre-service training of education students and in-service training of practicing teachers were the most important issues for the computer education of teachers. The results revealed that teachers were unprepared to use computers in their classrooms and they lack support and educational guidance and teachers will need continuing in-service programs as technology changes. The results also showed that teachers' use of computer technology was related to their training and preparation and standalone courses in instructional technology were not sufficient to prepare future teachers to use computer technology. An integration of technology application within existing teacher preparation courses was most desirable and had a greater effect on the use of computer technology in practice.

Natalie (2009) conducted a research (An analysis of the use of information and communication technology in Hong Kong primary school English lessons). The research was about how English was taught with and without the use of ICTs in Hong Kong primary schools and compared and evaluated the use of ICT-supported activities alone or combined with non ICT-supported activities. The study compared and contrasted the structure of English lessons in conventional classrooms versus computer-rich environments and highlighted what computers can and cannot do in comparison with other teaching tools in different instructional contexts. The study also was intended to investigate and analyze student-teacher interaction at various episodes in a lesson, i.e. how students responded to the teacher's questions and how the teacher provided feedback when the teacher switched between the use of different activities and tools. It was hoped to investigate the usefulness and effectiveness of teaching tools in a lesson. The research was developed in two phases: the pilot study and the main study. In the main study, before each lesson observation was conducted in a target school, the researcher interviewed the principal to get overall picture of school's policies on ICTs from an administration's perspective. Then, she interviewed teacher to be

observed in order to collect information about lesson plan, lesson objectives and attitudes towards the use of ICT in ELT. During the lesson observations in the main study, the researcher made notes of what was happening in the lesson and videotaped the lessons. After observations, questionnaires were administered to students at the very beginning (stage 1 and stage 2) of data collection in the main study to elicit their perceptions of the use of computers. The findings of the research revealed that successful use of ICTs relies heavily on how teachers play mediating roles in selecting and switching between different ICTs and non-ICT tools with associated amplification and reduction effects.

Bordbar (2010) conducted a research (English teachers' attitudes toward computer assisted language learning). The study attempted to investigate the reasons and factors behind teachers' use of computer technology in the classroom. In addition, the study aimed to explore teachers' attitudes towards computer and information technology, how they apply their practical computer-assisted language learning experience and knowledge to their language teaching. The participants of the study were (83) high school English as a Foreign Language teachers in Iran who had knowledge and experience of using computer for the purpose of learning and teaching English. The results showed that almost all the teachers had positive attitudes towards computer use in the class. The results also pointed to the importance of teachers' vision of technology itself, their experience with it, their level of computer skill and competence, and the cultural environment that surrounds its introduction into schools and English institutes in influencing their attitudes towards computer technology.

All the previous studies reviewed by the researcher are consistent with the present study that they tackle the importance of ICT as an educational means. Although, these studies were administered inside and outside Sudan, they yielded similar results and outcomes. These results came in line with the present study in different ways. For instance, the study that conducted by Rehab Abdelsalam Elsanousi Mohammed (2017) in which she investigated the use of digital

technologies in Sudanese university EFL classes in order to shed light on EFL students' English self- efficacy and active learning opportunities. She arrived at the conclusion that digital technologies at Karari University provides EFL students with ample opportunities to practice and acquire English. Furthermore, the study found that using digital technology has a direct impact on sustaining EFL students' direct autonomous learning. Likewise, the study conducted by Kmanour, E, L (2002) showed positive attitudes of the teaching staff towards using the instructional technologies. Equally, Y.Ezza. Gumma, Mohammed.Y (2000), their findings showed that there is a high level of digital literacy among its teaching staff. Similarly, Badawi, E, B, Hassan (2014), they used descriptive and analytical methods. Their study illustrated a positive mood towards benefits from using computer in EFL classroom. Generally, there are many themes in previous studies consistent with the present study such as:

- They investigate the use of ICT for educational purposes with regard to ICT adoption constraints and barriers.
- They followed the analytical method in their studies as the recent study.
- They suggested and recommended the use of ICT in EFL learning and teaching.
- They agreed that teachers have positive attitudes towards using ICT in English classroom instruction.
- They enforce the crucial role played by ICT at the university EFL classroom.
- They report on the status of ICT infrastructure and Innovative pedagogical practices.
- Participants employed at all previous studies either EFL students or teachers.
- The use and acceptance of ICT were influenced directly and indirectly by Social influence process and cultural factors.

- Perceived usefulness and staff members' (SMs) intrinsic motivation were the main reasons that encouraged the use of ICT.

However, the present study added more topics such as:

- It investigated the role that ICT can play in the development of Teachers' self-efficacy.
- It explored ICT self-efficacy levels among pre-service teachers', mainly the potential role of ICT in classrooms settings.
- It examined the attitudes of teachers concerning ICT use.
- It measured pre-service teachers' self-efficacy levels and their ability to adopted best teaching methods and classroom practices.
- It provided suggested examples of ICT courses and development programs.
- The present study provided a combination of ICT and Self-efficacy teacher development literature.

## **2.6 Summary**

This chapter provided the basic theoretical about the prospective role of computer access at University, ICT expertise and related computer qualifications in the development of pre-service teachers' self-efficacy. Moreover, it identify issues that may have impact on the successful implementation of ICT for teachers' self-efficacy development and identify areas of concern. The chapter focused more precisely on the definition of Self-efficacy, its sources, ways of developing it, its role in students' achievement, its relation with ICT and its role in teachers' professional development. The chapter also reviewed some related previous studies.

# **CHAPTER THREE**

## **Research Methodology**

### **3.0 Introduction**

This chapter describes the methodology for data collection and is structured into four sections. The first one deals with the methodology for data collection. The second section addresses the criteria used in instrument design and development i.e. the questionnaire and the interview. The third section defines the participants of the study. The fourth and the last section handles the issues of data collection procedure and data analysis.

### **3.1 Data Collection Methodology**

This study aims to contribute in developing and systematizing some knowledge in the role of ICT in teacher education and professional development. The focus will be on assessing the impact of incorporating ICT to develop teachers' sense of efficacy as computer users and in their professional practices, both in a short term and in a medium-term perspective. For achieving this objective, the data for this study will be obtained via a Mixed-method Technique. The idea of mixing qualitative and quantitative methods has stimulated much interest and debate.

Researchers increasingly have used mixed-method techniques to expand the scope of their studies. As advocates of mixed-method research have argued, the complexity of human phenomena mandates more complex research designs to capture them. This method of research can be combined at two levels.

- At the method level, combinations at the method level can be used to expand the scope of a study as researchers seek to capture method-linked dimensions of a target phenomenon, different aspects of reality lend themselves to different methods of inquiry.

- At the technique level, the technique level of research is the site where combinations actually occur and is most often referred to in the discussions of



mixed-method research. Such combinations entail the use of sampling, data collection, and data analysis techniques commonly (although not necessarily) conceived as qualitative or quantitative research. Because techniques are not tied neither to paradigms nor to methods, combinations at the technique level permit innovative uses of a range of techniques for a variety of purposes. Three purposes include (a) triangulation, to achieve or ensure corroboration of data, or convergent validation; (b) complementarity, to clarify, explain, or otherwise more fully elaborate the results of analyses; and (c) development, to guide the use of additional sampling, data collection and analysis techniques, Greene et al., (1989:259).

In sum, the researcher is going to use a descriptive analytical method that combine the two evaluation methodologies adopted for data collection. Those methods will include a mixture of an initial pre-service teachers' survey-questionnaire and a Follow-up in-depth Teacher Interview.

### **3.2 Instrument Design and Development**

The questionnaire and the interview will involve the collection of both, quantitative data, which will include pre-service teachers' personal information, their frequency of using computers, perceptions of their ICT skills and self-efficacy toward ICT in teaching and qualitative data which will include, pre-service teachers' levels of perceived self-efficacy with regard to ICT, motivation, capabilities to integrate ICT into learning and teaching techniques.

#### **3.2.1 The Questionnaire**

This questionnaire is organized in six sections as per the area of inquiry. All sections, apart from section one, will be established based on a research hypothesis. At the same time each hypothesis will be verified via a main question and a set of detailed statements.

- a. **Section one:** This introductory section deals with the general information about the respondents, specifically their gender and level of education.
- b. **Section two: Computer Access, Experience and Qualifications**

The Second section is planned to provide background information about the pre-service teachers' ICT knowledge. The section is divided into three parts, the first part deals with computer access at the University, the second part reports years of prior computer experience, responses will be one of the followings (No Experience, Less than 2 Years, From 2 -3 Years, and More than 3 Years). The third part designates the type of ICT or computer qualifications, responses will be one of the followings (No Qualifications, Short Courses, or Diploma).

Data obtained from this section is supposed to give answer to the first question thereby, answers will support or refute the first hypothesis.

**c. Section three: Frequency and Level of Computer and Hardware Products Use**

In this section respondents were asked to indicate the frequency of use and level of application for the items listed in the table. Items included a selection of twelve common and widely used educational computer and hardware products (PC, Notebook/ IPAD, Mobile Phone, CD/DVD Writer, Flash Drive, Printers and Scanner, Webcam, DVD Player, Digital or Video Camera, MP3 Player, Voice Recorder, E-dictionary).

This third section is divided into two parts, the first one deals with the frequency of use, responses were arranged in a three points Likert scale, where (1= Often, 2= Some Times, and 3= Never). The second section indicates the level of use, responses were also arranged in a three point Likert scale, where (1= Can Use, 2 = Can with help from others, and 3= cannot use).

Data obtained from this section is supposed to give answer to the second main question in that way, answers will support or refute the second hypothesis.

**d. Section four: Frequency and Level of Software and Communication Services Use**

This section is considered as the second pair of the previous section. Here the focus is on the software and communication services, predominantly their

frequency and level of use. Respondents were given a table containing twelve software and communication services that are widely used for academic purposes, these items include (Educational Programs, Word Processing Programs (E.g. Word), Spreadsheets (E.g. Excel), Presentation Program (E.g. PowerPoint), Music Programs (E.g. Win amp), Video Player Program (E.g. Windows Media Player), Web Browser (E.g. Internet Explorer), E-mail Program (E.g. Outlook), Chat Program (E.g. MSN), E-mail Groups (E.g. Yahoo/Facebook Groups), Web-based Forum, SMS).

Furthermore, this fourth section is divided into two parts, the first one deals with the frequency of use, responses were arranged in a three points Likert scale, where (1= Often, 2= Some Times, and 3= Never). The second part indicates the level of use, responses were arranged in a three point Likert scale, where (1= Can Use, 2 = Can with help from others, and 3= cannot use).

Data obtained from this section is supposed to give answer to the third main question, consequently answers will support or refute the third hypothesis.

#### **e. Section five: ICT Self-efficacy Measurement**

The fifth section is planned to measure the pre-service teachers' level of perceived self-efficacy with regard to ICT and their uses. The purpose of this part is to determine how pre-service teachers feel about integrating ICT into classroom teaching. This section comprises of seven statements. Accordingly, respondents were asked to indicate the strength of their agreement or disagreement by ticking (√) one of the given five points Likert scale, where (1=Strongly Disagree, 2= Disagree, 3= Not Sure, 4= Agree, and 5= Strongly Agree). Statements indicate to what extent pre-service teachers are (interested, enjoy, feel confident, and Looking forward) to integrate ICT in their current learning strategies and future teaching techniques.

Data obtained from this section is supposed to give answer to the fourth main question, based on that, answers will support or refute the fourth hypothesis.

#### f. **Section six: Level of Teachers' Self-efficacy**

Teacher self-efficacy is a motivational construct that directly influences outcomes in the classroom. It has been related to student achievement, commitment to teaching, greater levels of planning and organization and working longer with students who are struggling (Gibson and Dembo, 1984). Therefore, this section is aimed to probe deeply and measure Pre-service teachers' sense of self-efficacy. In this section the researcher is going to use (Teachers' Sense of Efficacy Scale: Long Form) designed by (Tschannen-Moran and Woolfolk Hoy, 2001).

The Teacher Efficacy Scale is widely used to measure efficacy beliefs. Student achievement and motivation, teachers' effort, openness to innovation, level of planning and organization, persistence, and enthusiasm are among the correlates of teacher efficacy (Tschannen-Moran *et al.*, 1998).

The Teachers' Sense of Efficacy Scale was used to measure perceived teachers' self-efficacy levels (Tschannen-Moran and Woolfolk Hoy, 2001). This scale has previously been used with pre-service teachers before and after professional experience (Tschannen-Moran and Woolfolk Hoy, 2001, and thus was considered valid for this study. The Teachers' Sense of Efficacy Scale consists of 24 items, assessed along a 5-point Likert continuum where, (1= Nothing, 2= Very Little, 3= Some Influence, 4= Quite a bit, 5= A great Deal). The instructions direct the respondents to, "Please respond to each of the questions by considering the combination of your current ability, resources, and opportunity to do each of the following in your present position" Tschannen Moran and Woolfolk Hoy, (2007:948).

To determine the *Efficacy in Student Engagement*, *Efficacy in Instructional Practices*, and *Efficacy in Classroom Management* subscale scores, researchers compute means of the items that load on each factor. Generally these groupings are:

- i. Efficacy in Student Engagement: Items 1, 2, 4, 6, 9, 12, 14, 22  
Examples of Questions at this section are:
  - a) To what extent can you provide an alternative explanation or example when students are confused?
  - b) How well can you implement alternative teaching strategies in your classroom?
- ii. Efficacy for Classroom Management: Items 3, 5, 8, 13, 15, 16, 19, 21  
Examples of Questions at this section are:
  - c) How much can you do to control disruptive behavior in the classroom?
  - d) How much can you do to calm a student who is disruptive or noisy?
- iii. Efficacy in Instructional Strategies: Items 7, 10, 11, 17, 18, 20, 23, 24.  
Examples of Questions at this section are:
  - e) How much can you do to motivate students who show low interest in schoolwork?
  - f) How much can you do to get students to believe they can do well in school work?

Data obtained from this section is supposed to give answer to the fifth main question, accordingly, answers will support or refute the fifth hypothesis

### **3.2.2 The Follow up Interview**

To further the investigation and get valid, reliable and useful findings, the researcher is going to conduct a qualitative in-depth teacher interview. A Semi-structured open-ended interview will be used to provide more focused information. The respondents for this interview will be the in-service teachers, i.e. teacher educators. The interview consists of five questions. The focus will be mainly on the level of motivation and confidence in addition to the Capabilities of integrating ICT into the teaching and learning approaches.

Since the purpose of this interview is to get opinions and experiences of experts and in order to keep the interview process flexible and the emphasis is on the answers given by the interviewees, the interview will take the written format. Questions of the interview were arranged as follows:

1. To what extent does the self-efficacy levels of Sudanese EFL teachers associated with computer access at University and with their ICT expertise in terms of prior computer experience and qualifications?
2. To what extent can EFL pre-service teachers implement and integrate the wide range capabilities of ICT into their current learning approaches and future classrooms contexts?

As it is obvious that, questions one and two have been taken from the main questions. To further the investigation and get valid, reliable and useful findings the researcher is hoping to find more information to support findings achieved by the questionnaire.

3. What are the concerns that may have an impact on the successful implementation of ICT for developing your self-efficacy?

Objective of this question is to uncover factors and concerns that may have an effect on the development of teachers' self-efficacy.

4. What will assist you to use ICT in your teaching approaches in the future?

In this question teachers were asked to indicate methods that may help them to integrate ICT in their teaching approaches.

5. What types of professional developments are considered most valuable for improving the self-efficacy from teachers' perspectives?

This question gives teachers the opportunity to express their point of view with regard to professional development programs.

### **3.3 Validity and Reliability**

To assure the reliability and validity of the questionnaire and the Interview, a number of five copies were distributed to EFL University teachers. The first version of the questionnaires was designed consisting of eight questions, the

researcher contacted a group of five English Language and Statistics experts who assessed and validate the questionnaire. Experts were chosen by the researcher to evaluate the questionnaire validity in terms of: its instructions, relevance of questions to content, suitability to research objectives and goals, number and arrangement of questions and time allocated to complete the questionnaire.

According to the feedback and the important comments, remarks being received, all suggestions were considered and necessary changes and adjustments were made before the administration of the questionnaire. For example, the number of the questions has been reduced to six, some items have been excluded for their irrelevancy; and some phrases and language difficulties have been modified and rephrased.

For questionnaire reliability, a pilot study was conducted. Five pre-service teachers were selected randomly for piloting three months before commencement of the actual administration of the instrument. Upon conducting the pilot study, the validity and the reliability have been checked based on the responses of the respondents when asked during its process time.

### **3.4 Participants of the Study**

#### **3.4.1 Questionnaire Respondents**

The respondents of the questionnaire are (53) volunteer Sudanese pre-service teachers from the Faculty of Education English Language Department at Sudan University for Science and Technology. Respondents are 17 Males and 36 Females. All respondents were BA students (4<sup>th</sup> Year) College of Education Sudan University. A ‘probability sampling’ strategy was used; therefore, every member of the population had a voluntary and equal chance to be included in the study. Distribution of the study questionnaire was carried out during their normal lecture sessions commencing early Sunday morning 25<sup>th</sup> of December 2016. After excluding incomplete surveys, the final number of useable surveys was 50 copies.

### **3.4.2 Interview Respondents**

All respondents were voluntary in-service teachers' at the faculty of Education English Language Department at Sudan University. The researcher distributed ten copies, but only seven copies were received.

## **3.5 Data Collection Procedure**

Prior to administering the instruments, a Pilot study was conducted to assure the validity and reliability of the methodology.

### **3.5.1 Pilot Study**

The pilot study was conducted to check the reliability of questionnaire in terms of its suitability of time allocated, questions and content. Five pre-service teachers were selected randomly for piloting three months before commencement of the actual administration of the instrument.

Upon conducting the pilot study, the validity and the reliability have been checked based on the responses of the respondents when asked during its process time. These points are as follows:

- a. The items and the questions of the questionnaire were clear and simple to read.
- b. The items and the questions were related to the respondents' area of specialization (i.e. TEFL).
- c. There was a reasonable time to go over all the items of the questionnaire.
- d. The items were understandable.

In view of the fact that the average time, which has been decided to answer the questionnaire items is (twenty minutes), the time-span of the questionnaire was considered adequate.

After the completion of the pilot study, all necessary modifications were made in order to meet the requirements of a reasonable time and sound design. After piloting, some questions of the questionnaires underwent some modifications as the researcher got feedback from the respondents. The presence



of the researcher marked as an important point to clarify some points, which needed some explanations.

### **3.5.2 Administration of the Questionnaire**

Questionnaire took place during the first semester, specifically Sunday 08:30 AM, December 25<sup>th</sup> 2016, at classroom (C20) Sudan University for Science and Technology. The researcher joined the first lecture with the students, throughout the lecture and before the questionnaire the researcher presented the theme of the research and shed light on the importance of conducting this questionnaire, 53 students were present and all volunteered to participate in the questionnaire. The male respondents are 16 or (32%) and the female respondents are 34 or (68%). All respondents were Grade Four (B.A) English Language students.

The researcher, with a great help from the lecturer, distributed questionnaire sheets to the students. Then the researcher went through all the questions one by one to make sure that students understand the questions and recognize how to fill in the answers space accurately. Cover letters have been attached to each questionnaire to explain the purpose of the research as well as to obtain greater cooperation.

The administration took about twenty five to thirty minutes to complete, because at some points the researcher had to give some definitions and directions to assure the accuracy of the responses.

### **3.5.3 Administration of the Interview**

A number of ten copies were handed to the in-service teachers, but only seven copies were received and analyzed.

## **3.6 Summary**

This chapter has discussed the methodology and research design adopted for the present study. It displayed how the study was constructed in terms of its framework, instrument of data collection used, selection criteria of subjects,

selection criteria of instruments, procedures followed to collect the data, and finally, methods of data analysis.

The next chapter will be the analysis of data obtained from the questionnaire and interview as described above.

# **CHAPTER FOUR**

## **Data Analysis and Discussion**

### **4.0 Introduction**

This chapter deals with data analysis, results and interpretation of the results based on the research questions and hypotheses. In discussing these results, statistical figures in terms of frequency and percentages are reported and displayed in tables and charts.

### **4.1 Data Analysis and Discussion**

Data analysis and discussion are carried out based on the statistics obtained from the method of data collection, i.e. questionnaires and interviews.

#### **4.1.1 The In-service Teachers' Follow up Interview**

To further the investigation and get valid, reliable and useful findings, the researcher conducted a qualitative in-depth teacher interview. A Semi-structured open-ended interview used to provide more focused information. The interview consists of five questions focused on confidence and capabilities of integrating ICT into the teaching and learning approaches.

#### **4.1.2 The Pre-service Teachers' Questionnaire**

The Questionnaire includes six sections; the First section consists of five variables relating to background information of the pre-service teachers. The Second section covers pre-service teachers' computer access, experience and qualifications. The Third section of the questionnaire examines pre-service teachers' frequency and level of computer and hardware products use. This section is divided into two parts; the first part displays the frequency of use, answers are arranged according to the given scale (1= Often, 2= Some Times, and 3= Never). The second part exhibits the level of use, answers as per this scale (1= Can Use, 2= Can with help from others, and 3= Cannot Use).

The Fourth section of the questionnaire measures pre-service teachers' frequency and level of software and communication services use. At this section, questions are distributed into, frequency of use according to the scale (1= Often, 2= Some Times, and 3= Never) and level of use as per the given scale (1= Can Use, 2= Can with help from others, and 3= Cannot Use).

The Fifth section of the questionnaire encompasses seven interrelated statements related to pre-service teachers' ICT self-efficacy measurement. A five-point Likert scale is used in this section, as per the following arrangement (Strongly Disagree (1), Disagree (2), Not Sure (3), Agree (4), and Strongly Agree (5)). Data obtained from each statement is illustrated, displayed and analyzed by means of tables and pie charts.

The Sixth and last section of the questionnaire deals with the measurement of pre-service teachers' sense of efficacy. The aim of this section is to gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. The general self-efficacy scale is based on (24) statements with responses given in a five point-Likert scale where (1= Nothing, 2= Very Little, 3= Some Influence, 4= Quite a bit and 5 = A great Deal).

In order to get an in-depth analysis, self-efficacy measurement items are assembled into three equal parts. Each part reports on a specific theme of pre-service teachers' sense of efficacy. Areas to be investigated by the self-efficacy measurement include the following:

- a) Efficacy in Student Engagement (Items: 1, 2, 4, 6, 9, 12, 14, 22)
- b) Efficacy in Classroom Management (Items 3, 5, 8, 13, 15, 16, 19, 21)
- c) Efficacy in Instructional Strategies (Items 7, 10, 11, 17, 18, 20, 23, 24)

Upon completion of analysis, a general pre-service teachers' sense of efficacy will be calculated and displayed.

## 4.2 Computer Access, Experience and Qualifications

Table (4.1) Computer Access, Experience and Qualifications

S	Values	Variables	Frequencies	%
1	Computer access at the University	No Access	37	74%
		Have Access	13	26%
2	Years of prior Computer Experience	No Experience	29	58%
		Less than 2 Years	18	36%
		From 2 -3 Years	0	0%
		More than 3 Years	3	6 %
3	Type of ICT or Computer Qualifications	No Qualifications	27	54%
		Short Courses	20	40%
		Diploma	3	6%

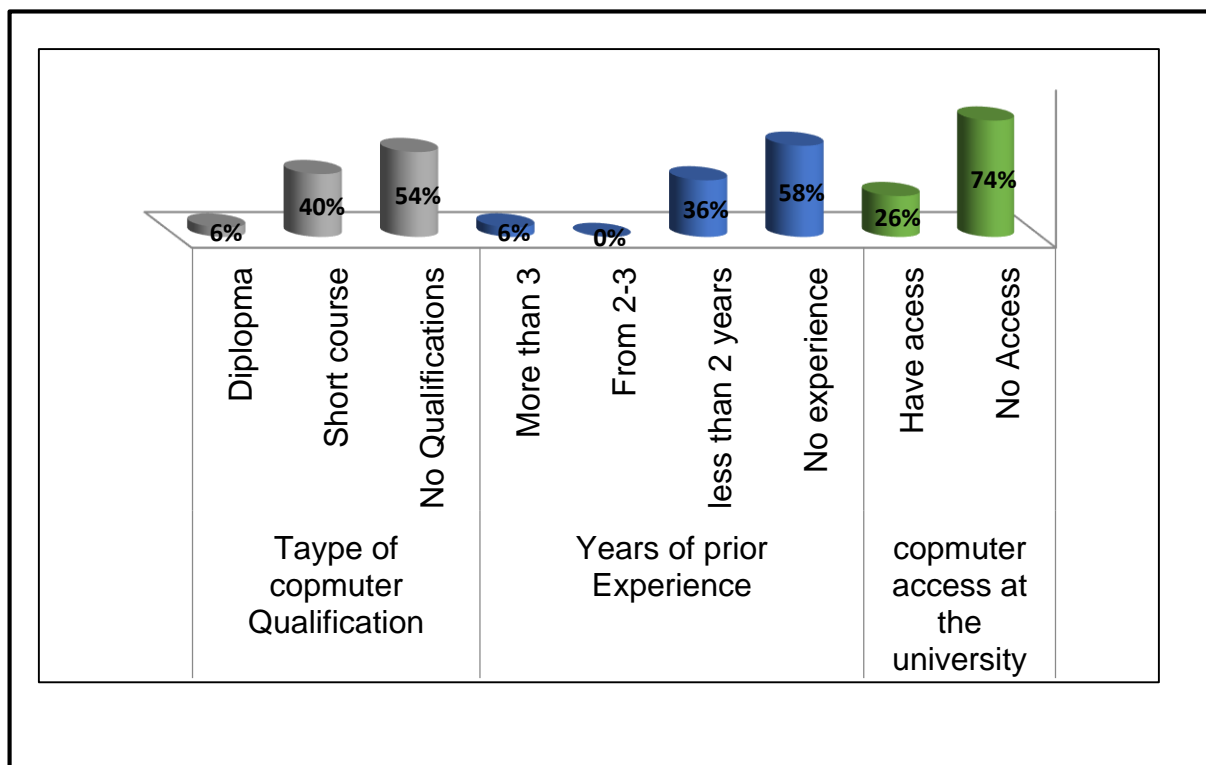


Chart (4.1) Computer Access, Experience and Qualifications

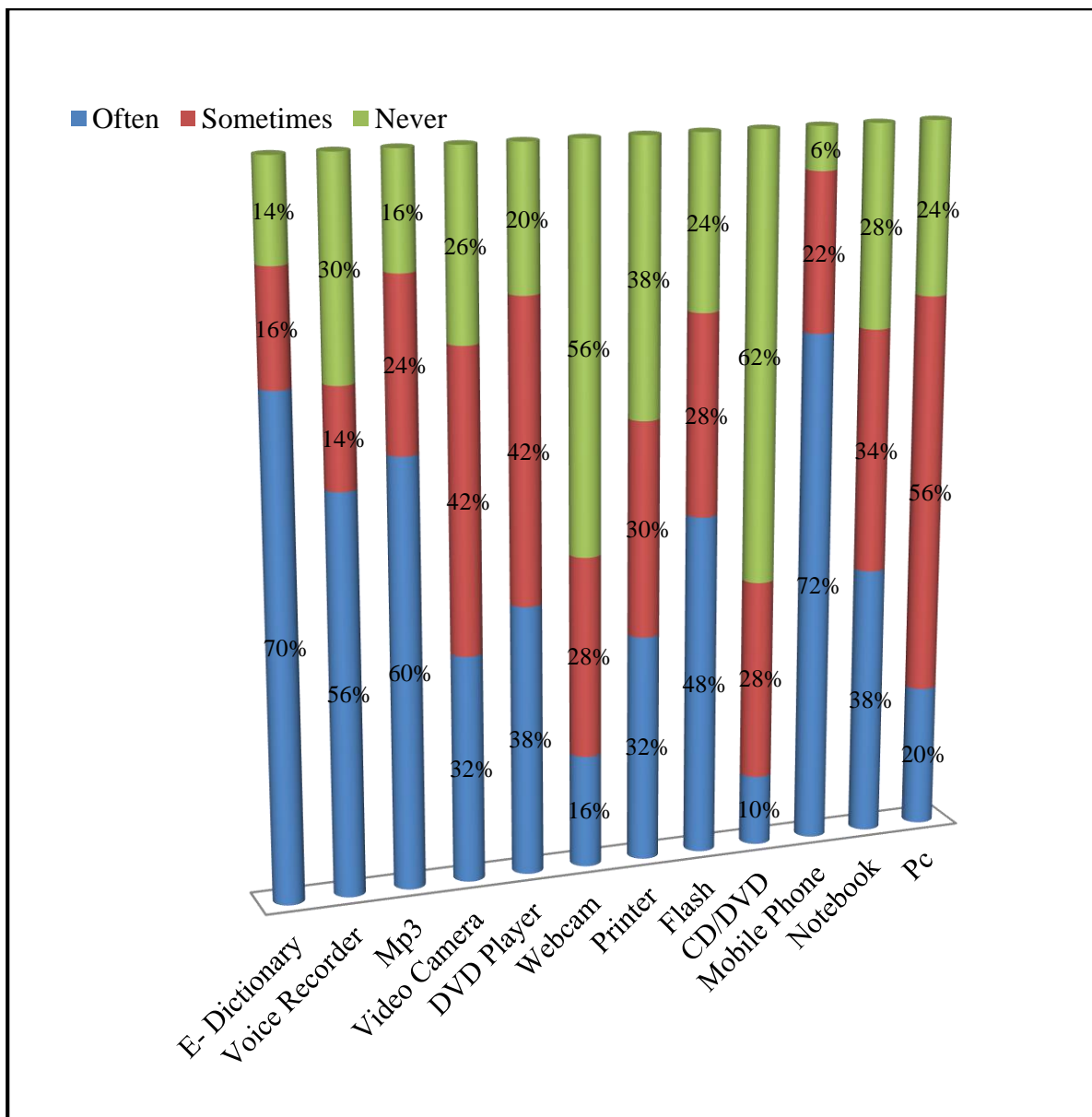
The above table and chart display responses of the pre-service teachers' concerning computer access, experience and qualifications statements. Overall,

responses varied considerably. The majority (74%) of pre-service teachers reported that they have no access to computers at the University, while (26%) indicated that they have access. As for prior computer experience, almost two thirds of pre-service teachers (58%) had no prior experience, whereas (36%) has less than 2 years of prior computer experience, and only (6 %) stated that they have more than 3 years of experience in using computers. Additionally, exactly two fifths (40%) of the pre-service teachers accomplished short courses in ICT or computer, whereas only (6%) achieved a diploma or a degree. Consequently, slightly more than half of the respondents (54%) assured that they have no computer or ICT qualification.

### 4.3 Frequency and Level of Computer and Hardware Products Use

Table (4.2) Frequency of Computer and Hardware Products Use

S	Computer and Hardware Products	Often		Sometimes		Never	
		N	%	N	%	N	%
1	PC	10	20%	28	56 %	12	24 %
2	Notebook/ IPAD	19	38 %	17	34 %	14	28 %
3	Mobile Phone	36	72 %	11	22 %	3	6 %
4	CD/DVD Writer	5	10 %	14	28 %	31	62 %
5	Flash Drive	24	48 %	14	28 %	12	24 %
6	Printers /Scanner	16	32 %	15	30 %	19	38 %
7	Webcam	8	16 %	14	28 %	28	56 %
8	DVD Player	19	38 %	21	42 %	10	20 %
9	Digital or Video Camera	16	32 %	21	42 %	13	26 %
10	MP3 Player	30	60 %	12	24 %	8	16 %
11	Voice Recorder	28	56 %	7	14 %	15	30 %
12	E-dictionary (CD)	35	70 %	8	16 %	7	14 %



Multi bar (4.2) Frequency of Computer and Hardware Products Use

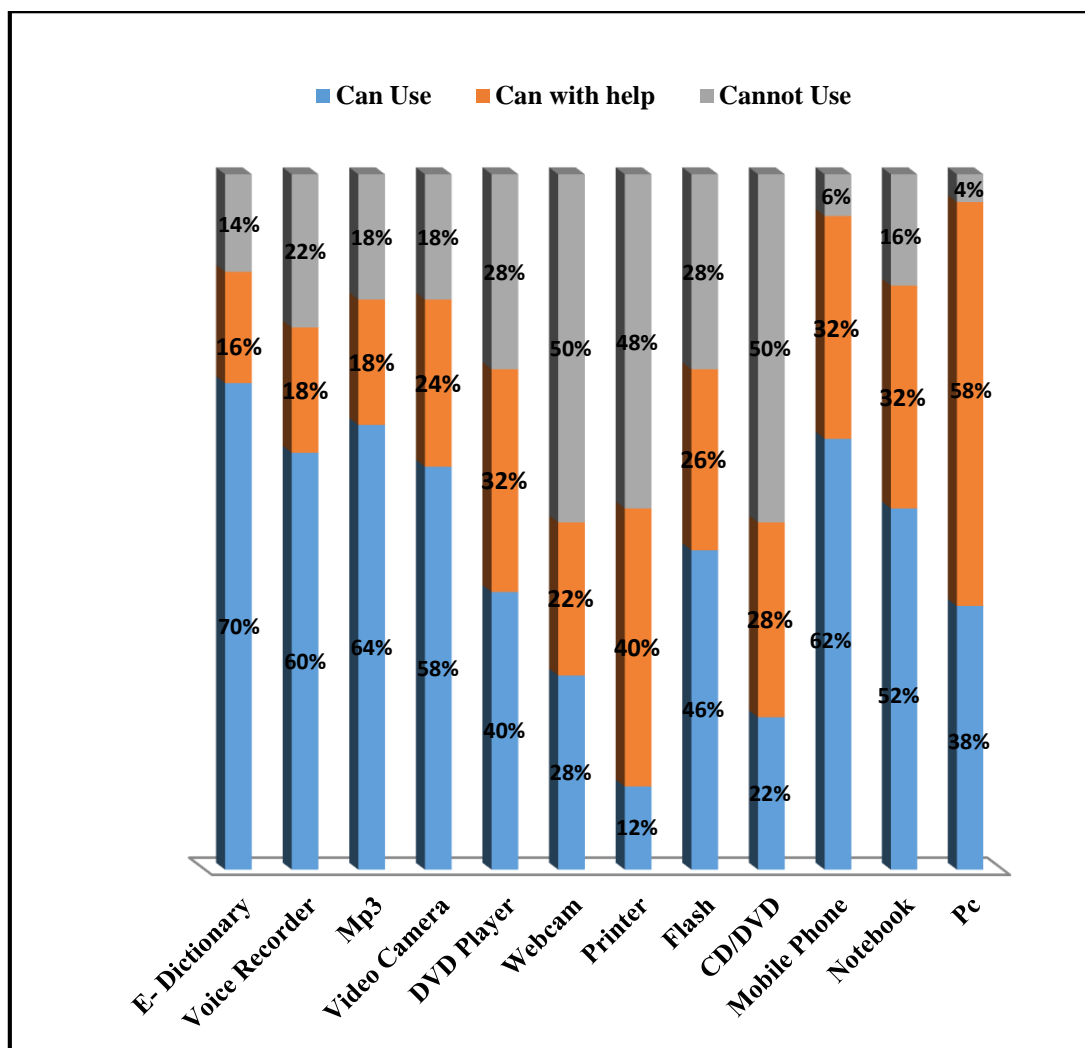
The table and multi-bar chart above display results of the pre-service teachers' frequency of computer and hardware products use. Generally, responses varied significantly. It is obvious that the highest hardware used by respondents is the mobile phone, with (94%) of respondents who frequently use mobile phones for educational purposes. However, E-dictionary (86%), MP3 Player (84%) and DVD Player (80%) use is quite at the high frequencies. Percentages and frequency of use still high with steady decline. Five devices scores came as

follows: PC and Flash Drive scored (76%), Digital or Video Camera (74%), Notebook/ IPAD (72%) and Voice recorders recorded slightly less percentage of responses (70%). Nevertheless, frequent use of Printers /Scanner has been expressed only by (62%) of the participants. The least frequently and commonly used technologies are Webcam (44%) and CD/DVD Writer (38%).

Table (4.3) Level of Computer and Hardware Products Use

S	Computer and Hardware Products	Can Use		Can use With Help		Cannot Use	
		N	%	N	%	N	%
1	PC	19	38 %	29	58 %	2	4 %
2	Notebook/ IPAD	26	52 %	16	32 %	8	16 %
3	Mobile Phone	31	62 %	16	32 %	3	6 %
4	CD/DVD Writer	11	22 %	14	28 %	25	50 %
5	Flash Drive	23	46 %	13	26 %	14	28 %
6	Printers/Scanner	6	12 %	20	40 %	24	48 %
7	Webcam	14	28 %	11	22 %	25	50 %
8	DVD Player	20	40 %	16	32 %	14	28 %
9	Digital or Video Camera	29	58 %	12	24 %	9	18 %
10	MP3 Player	32	64 %	9	18 %	9	18 %
11	Voice Recorder	30	60 %	9	18 %	11	22 %
12	E-dictionary (CD)	35	70 %	8	16 %	7	14 %





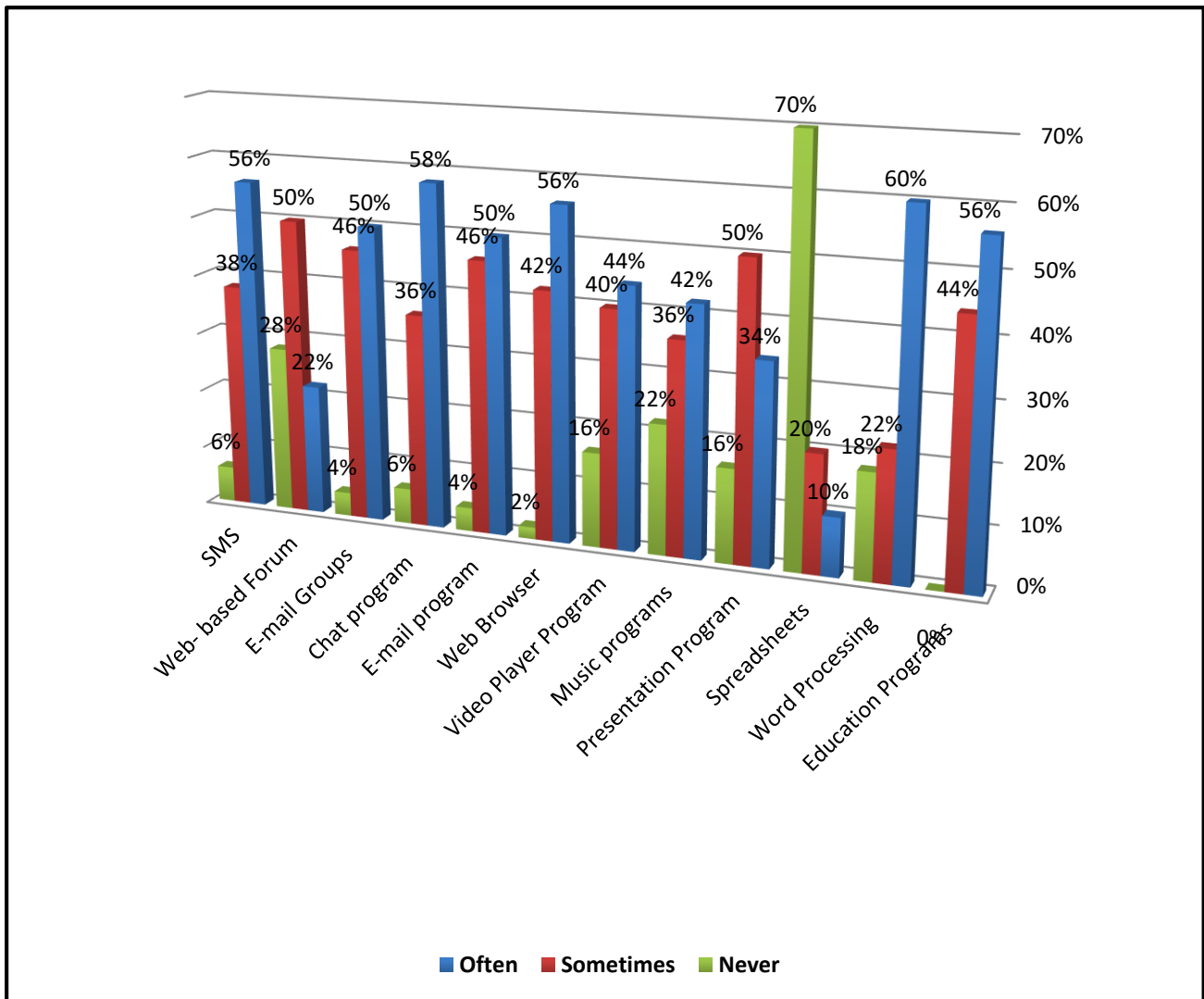
Multi bar (4.3) Level of Computer and Hardware Products Use

The main feature categorizing the above multi-bar chart is the higher percentages of respondents reporting that they can use computer and hardware products for educational purposes. The highest hardware used by respondents are the PC (96%) and mobile phones (94%) of respondents who are able to use those tools for educational purposes. Percentages still high with E-dictionary (86%), Notebook/ IPAD (84%), Digital or Video Camera and MP3 Player each of them scored (82%). Tools declined steadily at the frequency of use are, Voice recorders (78%), whereas DVD Player and Flash Drive each of them scored (72%). The least frequently and commonly used technologies are Printers/Scanner (52%), whereas Webcam and CD/DVD Writer (50%) for each of them.

#### 4.4 Frequency and Level of Software and Communication Services Use

Table (4.4) Frequency of Software and Communication Services Use

S	Software and Communication Services Use	Often		Sometimes		Never	
		N	%	N	%	N	%
1	Educational Programs	28	56 %	22	44 %	0	0 %
2	Word Processing Programs (E.g. Word)	30	60 %	11	22 %	9	18 %
3	Spreadsheets (E.g. Excel)	5	10 %	10	20 %	35	70 %
4	Presentation Program (E.g. PowerPoint)	17	34 %	25	50 %	8	16 %
5	Music Programs (E.g. Win amp)	21	42 %	18	36 %	11	22 %
6	Video Player Program(Windows Media Player)	22	44 %	20	40 %	8	16 %
7	Web Browser (E.g. Internet Explorer)	28	56 %	21	42 %	1	2 %
8	E-mail Program (E.g. Outlook)	25	50 %	23	46 %	2	4 %
9	Chat Program (E.g. MSN)	29	58 %	18	36 %	3	6 %
10	E-mail Groups (E.g. Yahoo/Facebook Groups)	25	50 %	23	46 %	2	4 %
11	Web-based Forum	11	22 %	25	50 %	14	28 %
12	SMS	28	56 %	19	38 %	3	6 %



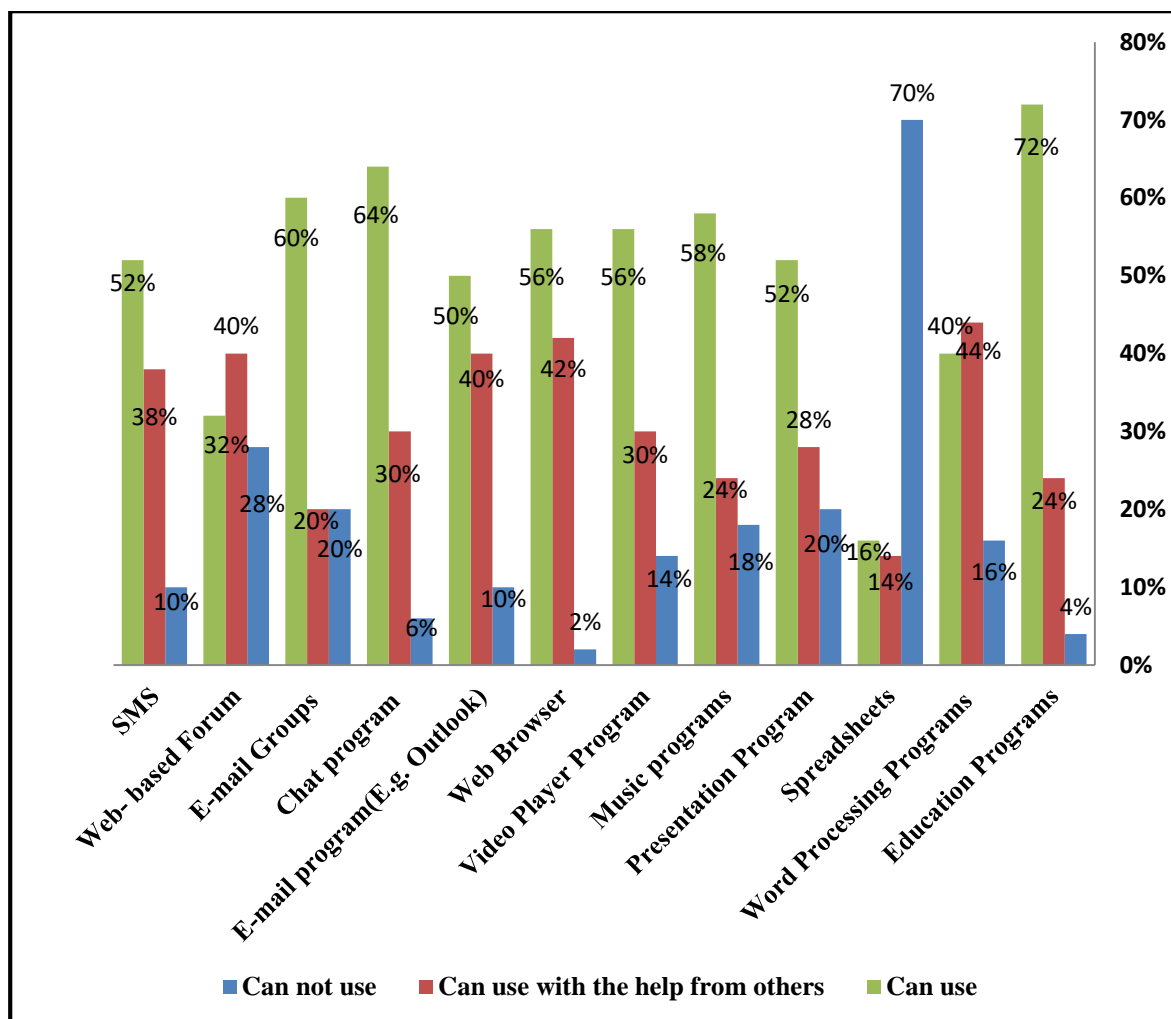
Multi bar (4.4) Frequency of Software and Communication Services Use

The table and multi-bar chart above display results of the Pre-service Teachers' Frequency of software and communication services Use. Generally, responses varied considerably. It is obvious that the highest software used by respondents is the educational programs, with all (100%) respondents frequently use educational programs for educational purposes, while web browser (98%), then each of the E-mail program and the E-mail groups (96%) use is quite at the high frequencies. Percentages still high with steady decline at the frequency of use, where SMS and chat program scored (94%). Additionally, the level of use for presentation program and video player program witness some drop to (84%)

for each of them, whereas word processing programs scored (82%).The least frequently and commonly used technologies are music programs (E.g. Win amp) (78%) and web-based forum (72%) among which spreadsheets (E.g. Excel) (30%) has the lowest level of use.

Table (4.5) Level of Software and Communication Services Use

S	Software and Communication Services Use	Can Use		Can with Help		Cannot	
		N	%	N	%	N	%
1	Educational Programs	36	72 %	12	24 %	2	4 %
2	Word Processing Programs (E.g. Word)	20	40 %	22	44 %	8	16 %
3	Spreadsheets (E.g. Excel)	8	16 %	7	14 %	35	70 %
4	Presentation Program (E.g. PowerPoint)	26	52 %	14	28 %	10	20 %
5	Music Programs (E.g. Win amp)	29	58 %	12	24 %	9	18 %
6	Video Player Program(Windows Media Player)	28	56 %	15	30 %	7	14 %
7	Web Browser (E.g. Internet Explorer)	28	56 %	21	42 %	1	2 %
8	E-mail Program (E.g. Outlook)	25	50 %	20	40 %	5	10 %
9	Chat Program (E.g. MSN)	32	64 %	15	30 %	3	6 %
10	E-mail Groups (E.g. Yahoo/Facebook Groups)	30	60 %	10	20 %	10	20 %
11	Web-based Forum	16	32 %	20	40 %	14	28 %
12	SMS	26	52 %	19	38 %	5	10 %



Multi bar (4.5) Level of Software and Communication Services Use

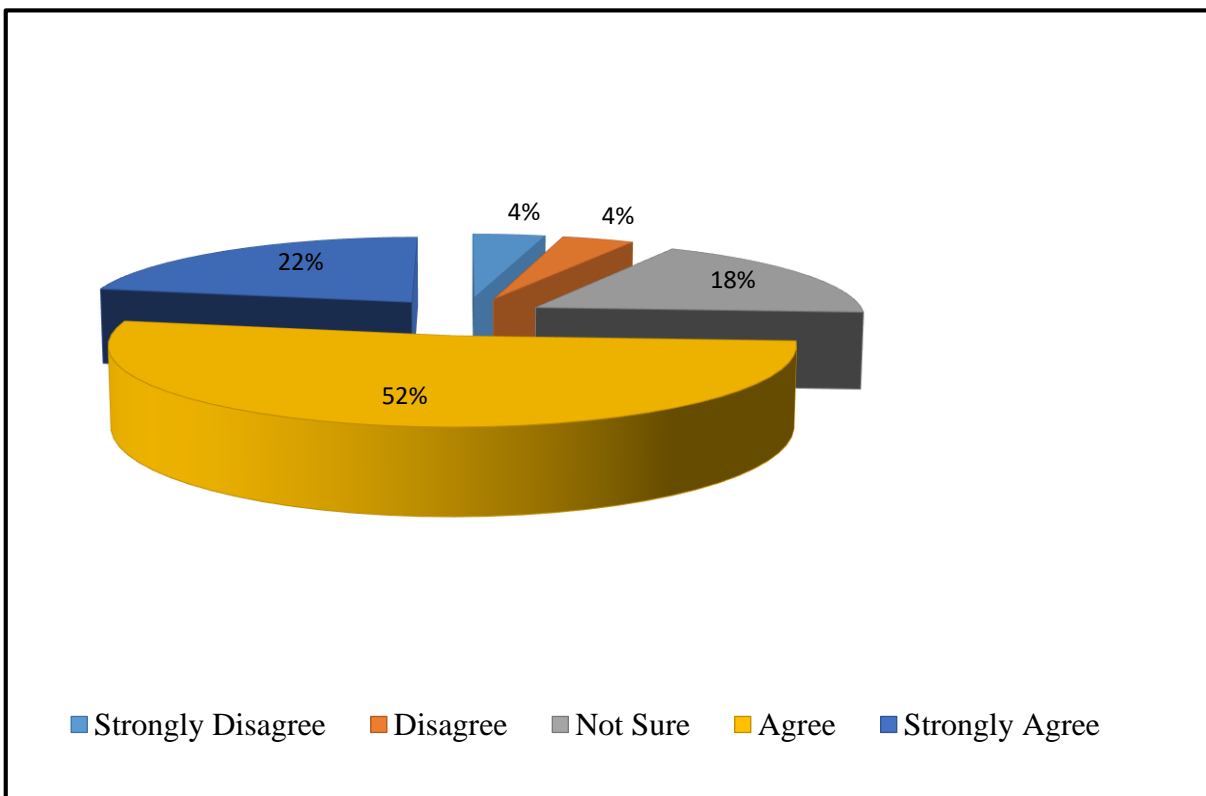
The main feature categorizing the above multi-bar chart is the higher percentages of respondents reporting that they can use software and communication services for educational purposes. The highest hardware used by respondents are the web browser (98%), educational programs (96%) and chat program, with (94%) of respondents who are able to use these tools for educational purposes. Additionally, the level of use for SMS and E-mail program (90%) for each of them, while video player program (86%) and word processing programs (84%). Tools with steady decline at the level of use are music programs (82%), whereas presentation program and E-mail Groups each of them scored (80%). The least frequently and commonly used technologies are Web-based Forum (72%), whereas spreadsheets level of use dropped sharply to (30%).

## 4.5 ICT Self-efficacy Measurement

The following tables and pie charts illustrate and display the data on the different Pre-service Teachers' ICT Self-efficacy Measurements.

Table (4.6) ICT Self-efficacy Measurement  
(*I am interested in implementing ICT in my learning strategies*)

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
N	2	2	9	26	11
%	4%	4%	18%	52%	22%

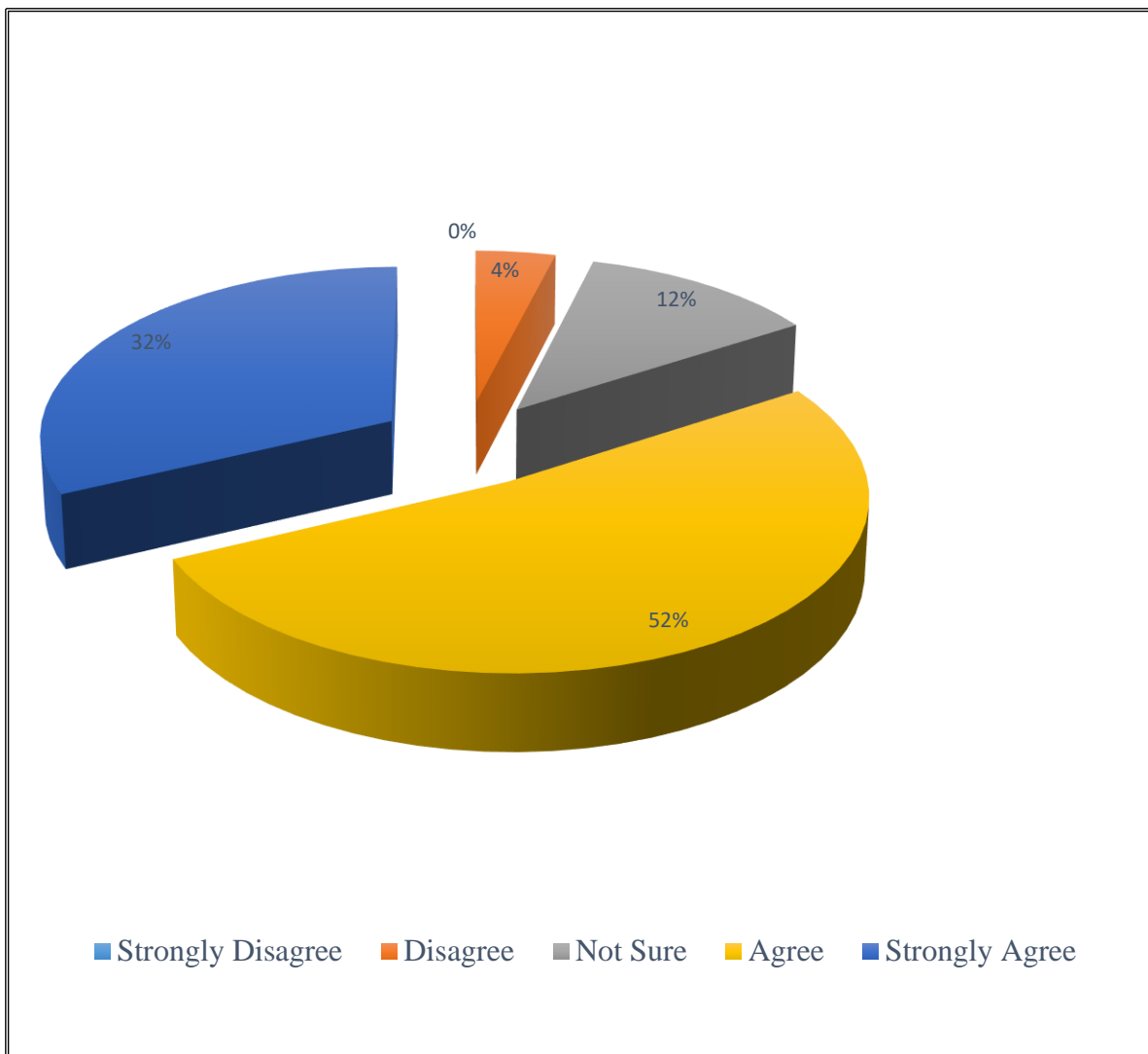


Pie chart (4.6) ICT Self-efficacy Measurement

According to the table and pie chart (4.6) above, almost three quarters of the pre-eservice teachers or (74%) agreed that they are interested in implementing ICT in their learning strategies, whereas only (8%) disagreed with the statement. However, the rest of the respondents i.e. (18%) were not sure.

Table (4.7) ICT Self-efficacy Measurement  
*(I enjoy implementing ICT in my learning strategies)*

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
N	0	2	6	26	16
%	0 %	4%	12 %	52%	32 %



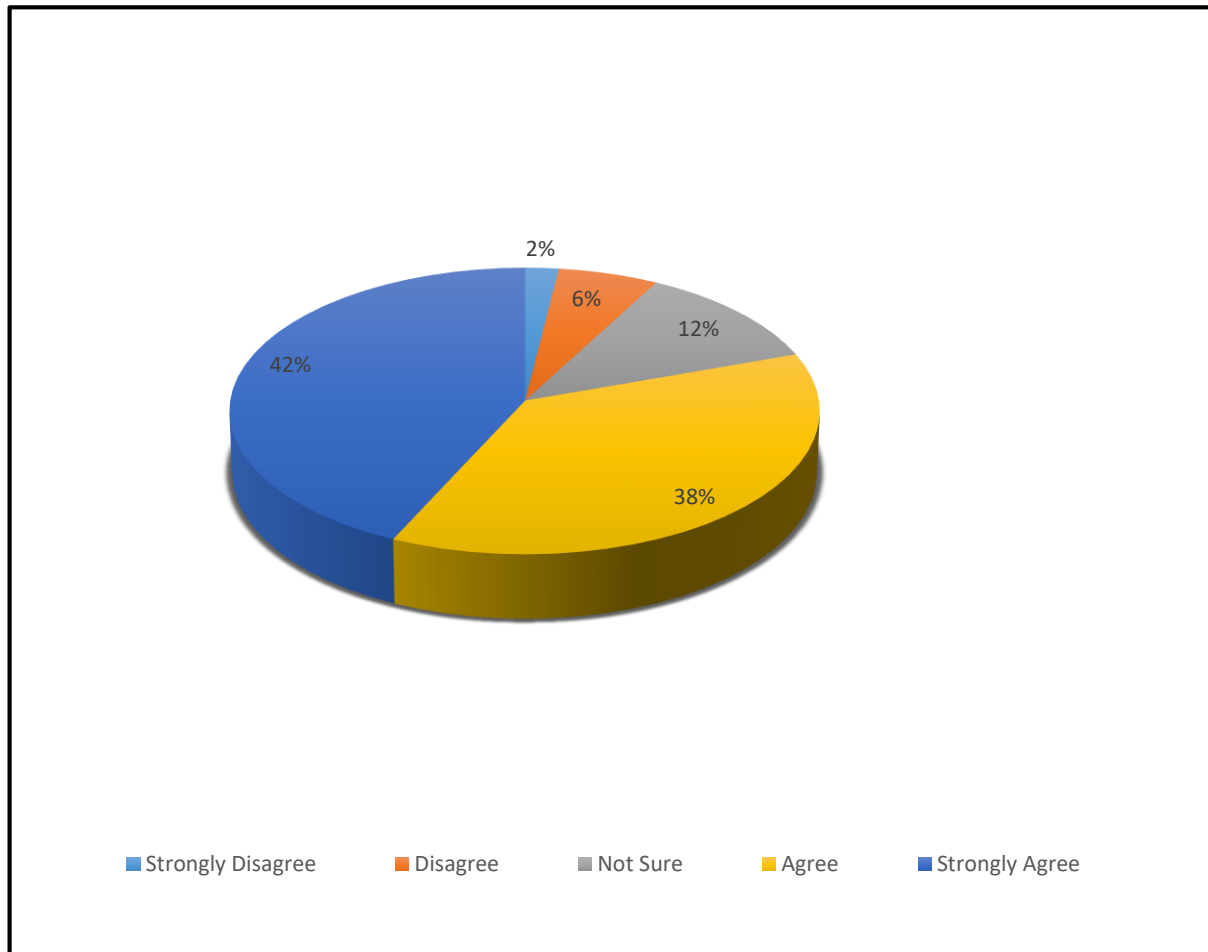
Pie chart (4.7) ICT Self-efficacy Measurement

As illustrated in the table and pie chart, mostly all (84%) the respondents agreed that they enjoy implementing ICT in their learning strategies, while only (4%) of the respondents indicated their disagreement with the statement. Therefore, (12%) of the respondents were not sure about their decision.

Table (4.8) ICT Self-efficacy Measurement

*(I feel confident/ satisfied in implementing ICT in my learning strategies)*

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
N	1	3	6	19	21
%	2 %	6 %	12 %	38 %	42 %



Pie chart (4.8) ICT Self-efficacy Measurement

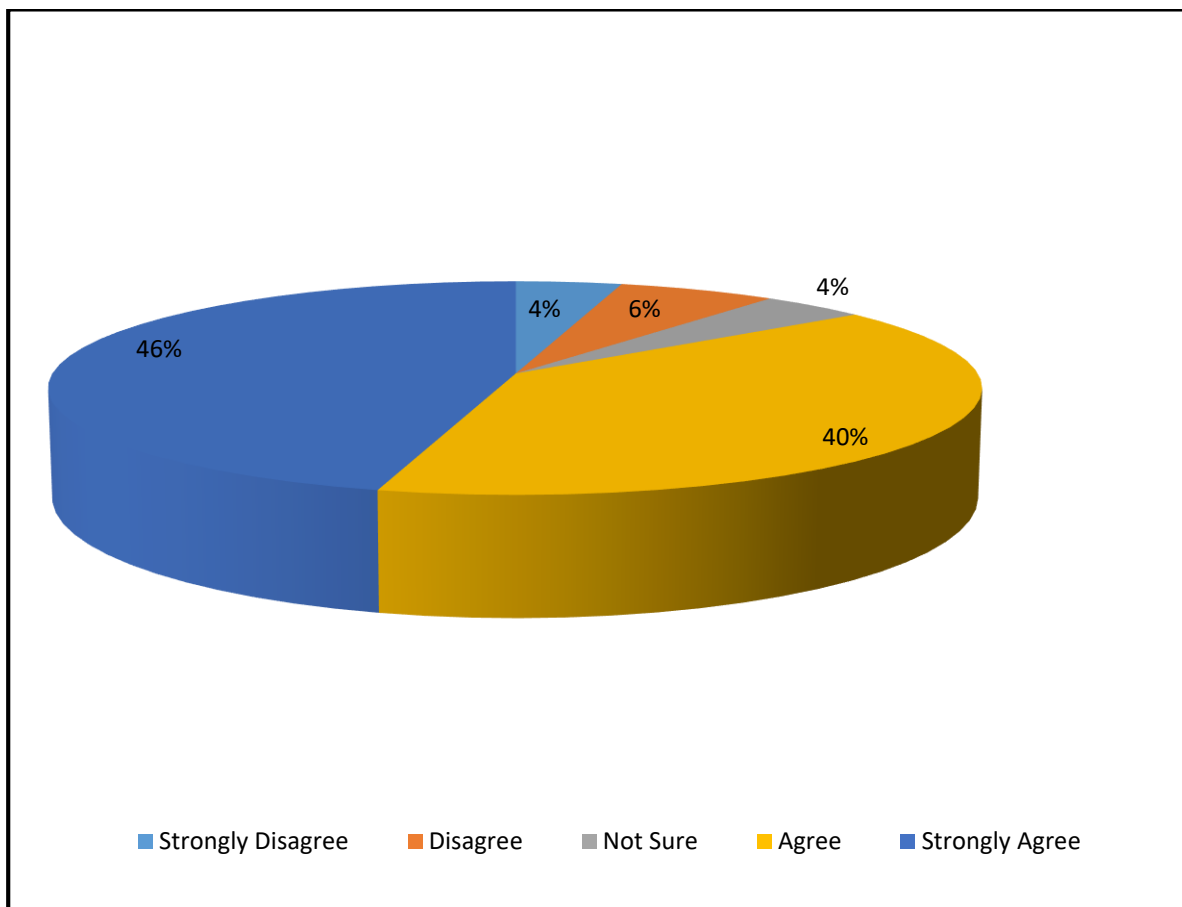
As it is obvious from the table and chart (4.8), nearly all, or (80%) of respondents indicated that they feel confident/ satisfied in implementing ICT in their learning strategies. At the same time, percentage dropped to only (8%) disagreed with the statement; however, (12%) were not sure.



Table (4.9) ICT Self-efficacy Measurement

*(I am looking forward to integrate ICT in my teaching techniques)*

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
N	2	3	2	20	23
%	4 %	6 %	4 %	40 %	46 %



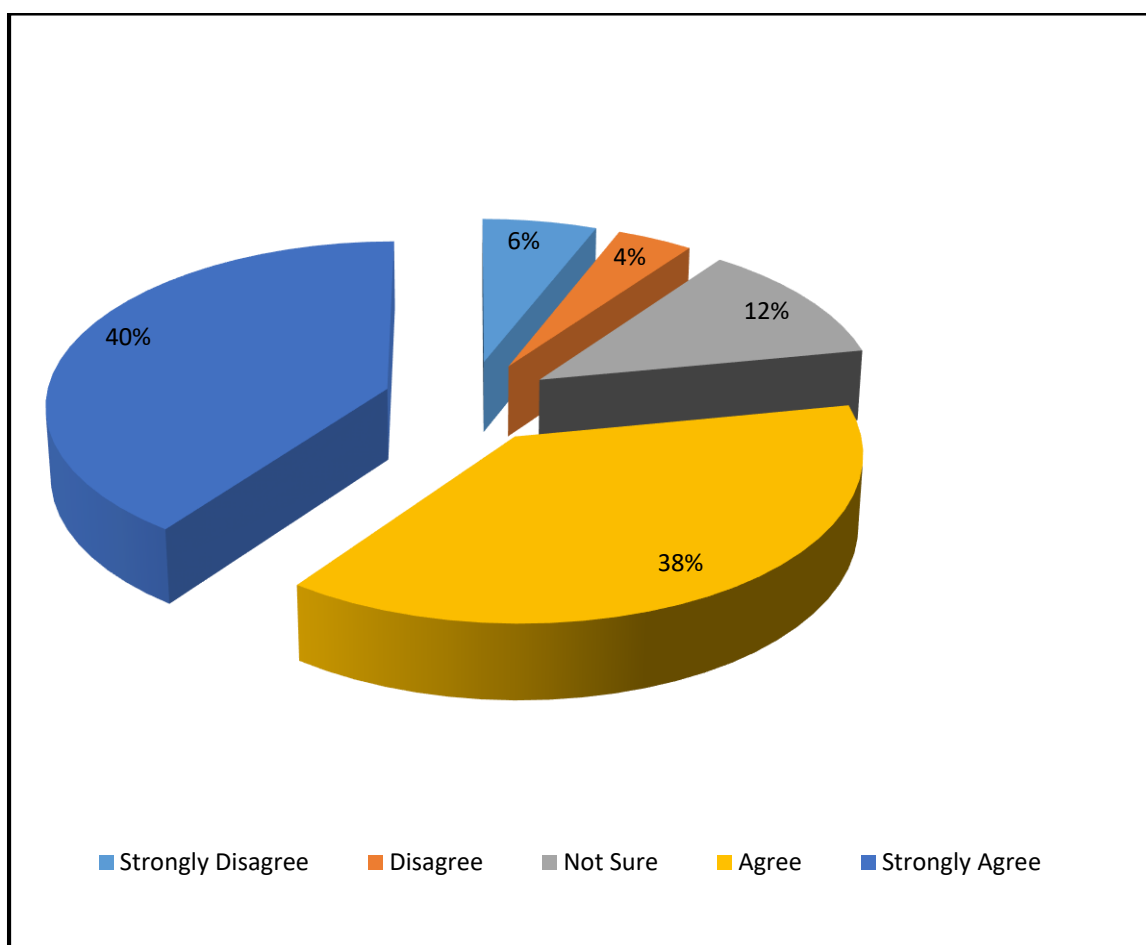
Pie chart (4.9) ICT Self-efficacy Measurement

The table and chart above showed that the overwhelming majority of respondents (86%) are looking forward to integrate ICT in their teaching techniques. However, only (10%) of respondents expressed their disagreement with the statement, at the same time (4%) of respondents were not sure about their decision.

Table (4.10) ICT Self-efficacy Measurement

*(I am Interested in integrating ICT in my teaching techniques in the future)*

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
N	3	2	6	19	20
%	6 %	4 %	12 %	38 %	40 %



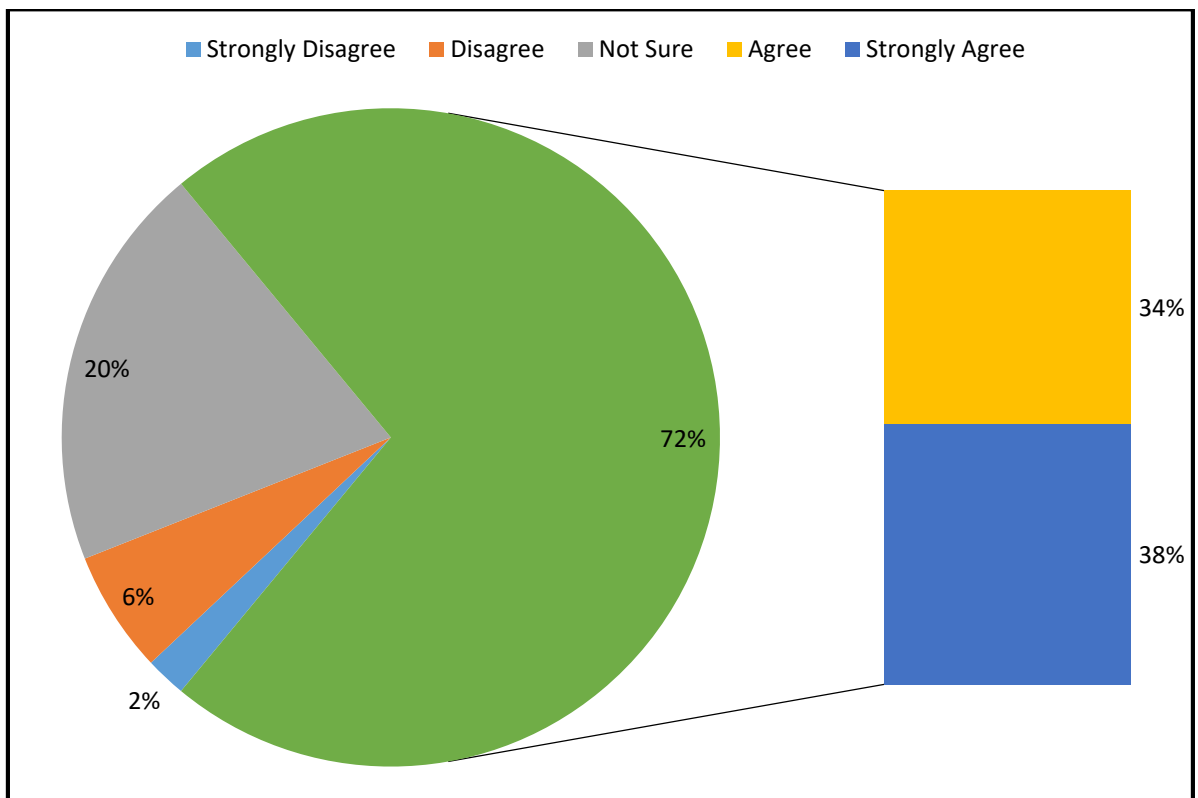
Pie chart (4.10) ICT Self-efficacy Measurement

As shown in the table and demonstrated by the pie chart above, slightly more than three quarters (78%) of the pre-service teachers are interested in integrating ICT in their teaching techniques in the future. According to the given data, only (10%) emphasized their disagreement with the statement, while (12%) were unsure.

Table (4.11) ICT Self-efficacy Measurement

*(I am sure that I can integrate ICT in my learning techniques in the future)*

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
N	1	3	10	17	19
%	2 %	6 %	20 %	34 %	38 %



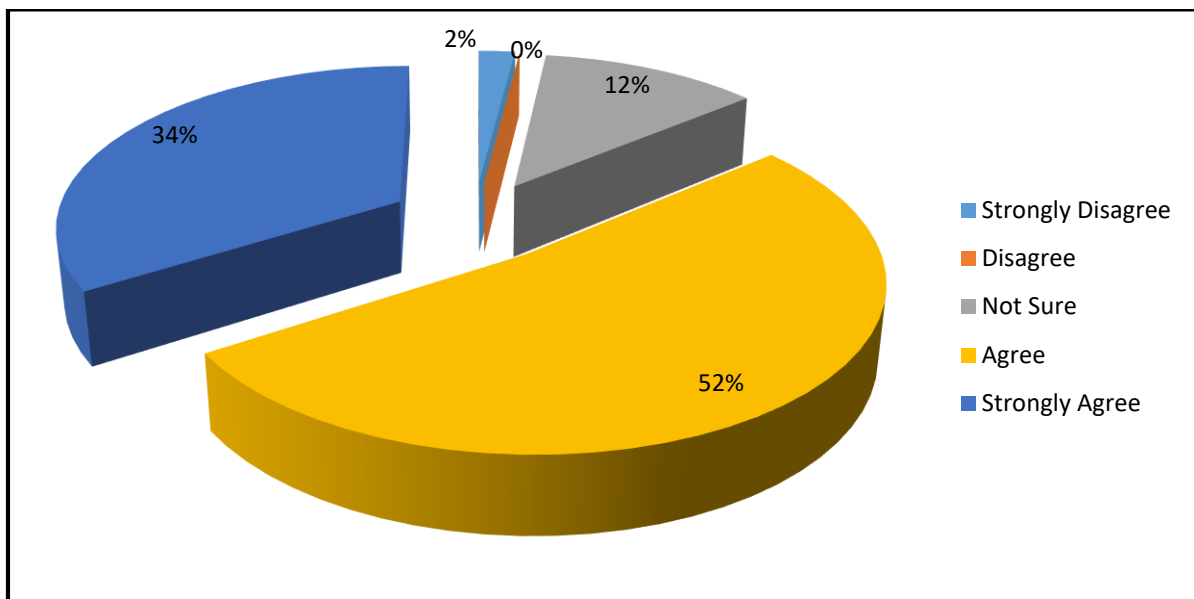
Pie chart (4.11) ICT Self-efficacy Measurement

The provided pie chart and table illustrates five different modes of confidence that pre-service teachers possess regarding the use of ICT in their learning techniques in the future. As it is observed from the given diagram, approximately three quarters (72%) of the total respondents showed their agreement with the statement. However, numbers tended to fall in the disagreement when only (8%) showed their disagreement. Whereas (20%) of respondents were not sure about their confidence.

Table (4.12) ICT Self-efficacy Measurement

*(I am sure that I can integrate ICT in my teaching techniques in the future)*

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
N	1	0	6	26	17
%	2 %	0 %	12 %	52 %	34 %



Pie chart (4.12) ICT Self-efficacy Measurement

The given table and pie chart illustrations give data on how sure the pre-service teachers are, with regard to the integration of ICT in their teaching techniques in the future. It is obvious that a devastating number (86%) of respondents agreed with the statement, while (12%) of them were not sure, however, only (2%) disagreed with the statement.

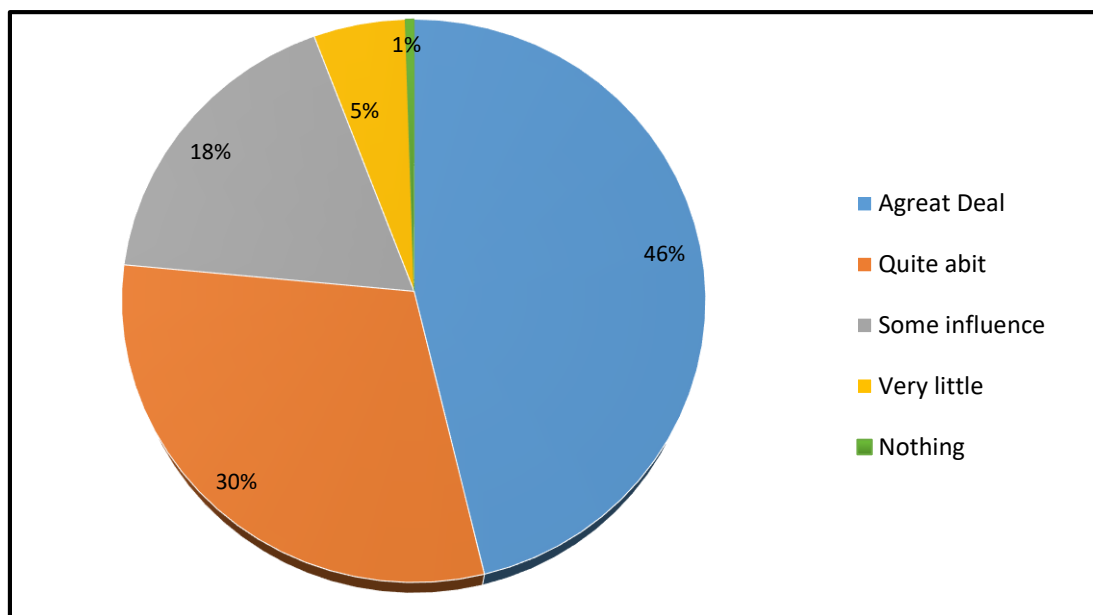
#### 4.6 Analysis of Teachers' Sense of Efficacy Scale

Three moderately correlated factors have been consistently found in the Teachers' Sense of Efficacy Scale (TSES). These are teachers' efficacy in: Student Engagement, Instructional Practices, and Classroom Management. The authors (Tschannen-Moran, M., and Woolfolk Hoy, A. (2001), 17, 783-805)

note that "With pre-service teachers we recommend that the full 24-item scale (or 12-item short form) be used, because the factor structure often is less distinct for these respondents.

Table (4.13) Teachers' Sense of Efficacy Scale  
(Efficacy in Student Engagement (Items: 1, 2, 4, 6, 9, 12, 14, and 22))

	Nothing	Very Little	Some Influence	Quite a bit	A great Deal
Total	2	21	71	121	185
Mean	0.25	2.62	8.87	15.12	23.12
%	1 %	5 %	18 %	30 %	46 %



Pie chart (4.13) Teachers' Sense of Efficacy Scale

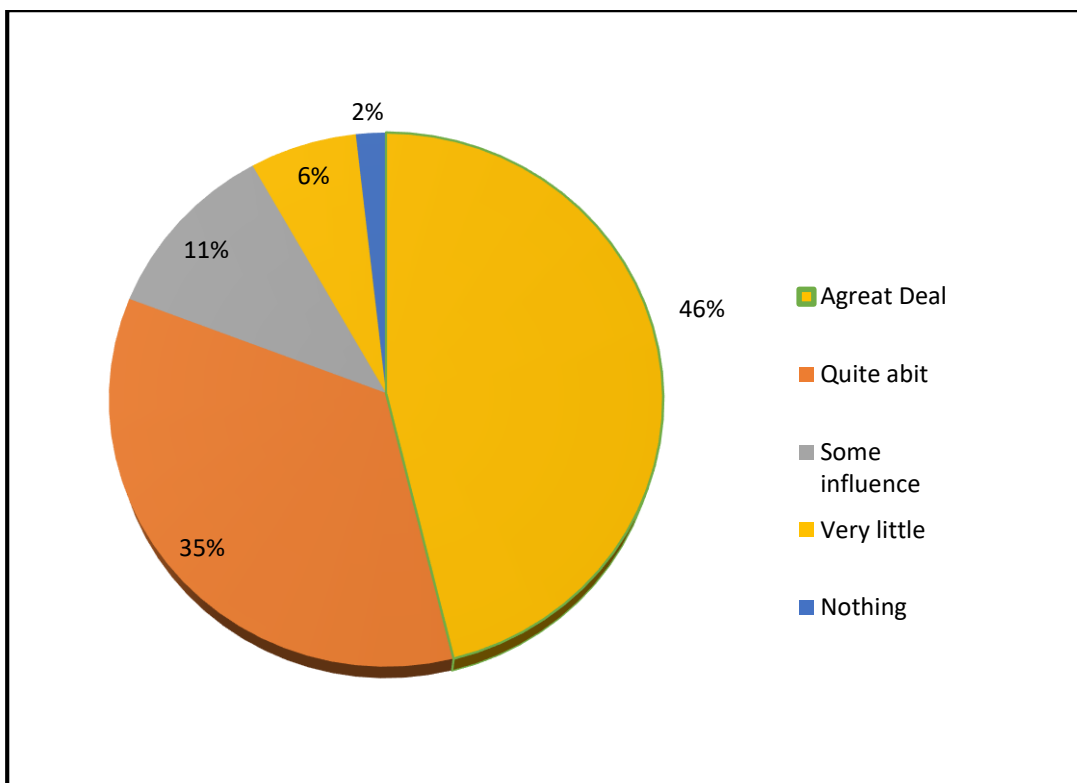
As shown in the table and demonstrated by the pie chart above, the mean scores for the eight statements ranged from (0.25 to 23.12). Standard deviation scores also had a narrow range. Furthermore, the total self-efficacy was calculated to establish the general picture as well as to gain more understanding of the participants' responses (Pallant, 2007: 84-86). The majority or three quarters

responses, (76%) from the total number of pre-service teachers reported that they could have an effective positive impact to motivate students who show low interest in schoolwork. Approximately one-fifth (18%) of respondents assured that they can have some influence. Nevertheless, only (6%) admitted that they cannot you do anything to get students to believe they can do well in schoolwork.

Table (4.14) Teachers’ Sense of Efficacy Scale

(Efficacy in Classroom Management (Items 3, 5, 8, 13, 15, 16, 19, 21))

	Nothing	Very Little	Some Influence	Quite a bit	A great Deal
Total	7	25	43	135	180
Mean	0.87	3.12	5.37	16.87	22.5
%	2 %	6 %	11 %	35 %	46 %



Pie chart (4.14) Teachers’ Sense of Efficacy Scale

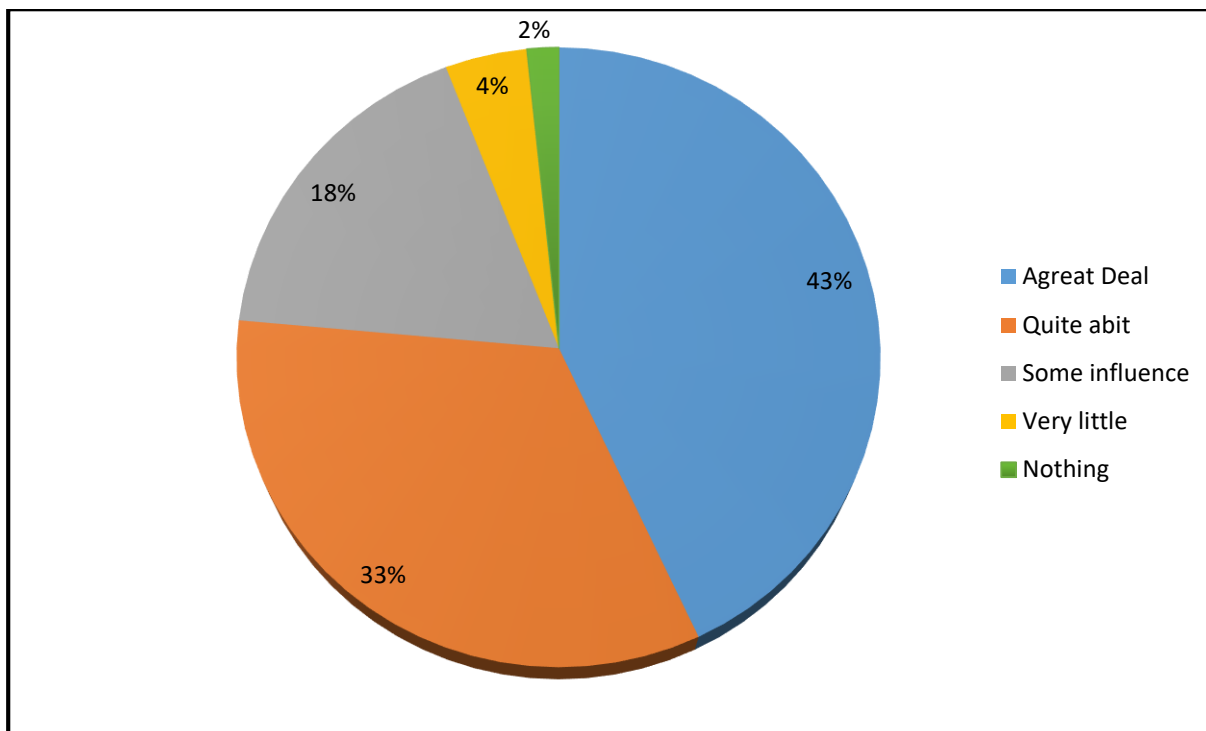
Classroom management is generally perceived as a domain of classroom processes related to how well teachers manage students' behavior and instructional time, and provide lessons and materials that maximize learning opportunities (Pianta et al., 2008). As displayed in the table and demonstrated by the pie chart above, the mean scores for the eight statements ranged from (0.87 to 22.5). Standard deviation scores also had a narrow range. The vast majority of respondents (81%) guaranteed that they could have a powerful influence to control disruptive behavior in the classroom and calm disruptive or noisy students. However, this level of management decreased to only (11%) pre-service teachers declared that their influence is limited to some extent.

On the other hand, this number dropped to (8%) of respondents who established that their power is very little, admitting that they cannot do anything to manage their classroom.

Table (4.15) Teachers' Sense of Efficacy Scale

(Efficacy in Instructional Strategies (Items 7, 10, 11, 17, 18, 20, 23, 24))

	Nothing	Very Little	Some Influence	Quite a bit	A great Deal
Total	5	17	71	134	173
Mean	0.625	2.125	8.875	16.75	21.625
%	2 %	4 %	18 %	33 %	43 %



Pie chart (4.15) Teachers' Sense of Efficacy Scale

It is commonly believed that students learn more when teachers make use of tools that actively involve and cognitively inspire students in class. Consistent with this notion, various instructional learning formats as consequences of TSE have been considered in previous studies. As presented in the table and demonstrated by the pie chart above, the mean scores for the eight statements ranged from (0.6 to 21.6). Standard deviation scores also had a narrow range. Overall, three quarters of respondents (76%) from the total number of pre-service teachers specified that they could update their instructional strategies, provide explanations and implement alternative teaching strategies.

Yet, (18%) from the respondents specified that they will have some influence in tailoring and changing their teaching strategies to suit students need. Nevertheless, this ratio decreased to (6%) of respondents admitted that they cannot change their instructional strategies or give any examples when students are confused.



## **4.7 Discussion of Interview Results**

Interview papers were distributed to a number of (10) EFL in-service teacher at Sudan University of Science and Technology English Language Department. Seven papers were received and analyzed. Hereinafter are the interview questions and a discussion of results.

### **Question One**

To what extent does the self-efficacy levels of Sudanese EFL teachers associated with computer access at University and with their ICT expertise in terms of prior computer experience and qualifications?

In general, most interviewees confirmed that accessing computers at University and ICT experience would enforce and support higher levels of ICT self-efficacy among EFL pre-service teachers.

### **Question Two**

To what extent can EFL pre-service teachers implement and integrate the wide range capabilities of ICT into their current learning approaches and future classrooms contexts?

Answers to the second question confirmed that EFL pre-service teachers retain the knowledge and skills to implement ICT capabilities into their current learning approaches and future classrooms contexts.

### **Question Three**

What are the concerns that may have an impact on the successful implementation of ICT for developing your self-efficacy?

As viewed by interviewees, the following points summarized concerns that may have an impact on successful implementation of ICT for the development of self-efficacy:

- a. Availability of ICT Infrastructure and Tools
- b. Internet and Intranet Services
- c. Management and Maintenance of ICT resources

#### **Question Four**

What will assist you to use ICT in your teaching approaches in the future?

As declared by Interviewees, the following will assist teachers to adopt ICT in teaching practices:

- a. Identify and Recognize best ICT tools suitable for teachers' use
- b. ICT Infrastructure, tools, Courses and continues training

#### **Question Five**

What types of professional developments are considered most valuable for improving the self-efficacy from teachers' perspectives?

Most interviewees recommended the following professional development courses to boost their self-efficacy levels:

- a. Annual ICT Specialized and advance courses
- b. CELTA and TESOL courses
- c. ICT Specialized Workshops and Seminars

### **4.8 Questionnaire Results by Hypotheses**

This study was set out to investigate the research hypotheses and determine answers to the research questions.

## **Hypothesis One**

- Higher levels of EFL pre-service teachers' self-efficacy are associated positively with computer access at University, ICT expertise and related computer qualifications.

## **Question One**

- To what extent does the self-efficacy of pre-service teachers associated with computer access at the University and with their ICT expertise in terms of prior computer experience and qualifications?

To test the first hypothesis, a broad question was set, then three statements were formulated to verify hypothesis one.

- **Statement one: Computer access at the University**

As shown and demonstrated by table and bar chart (4.1) above , the majority or three quarters (74%) of pre-service teachers reported that they have no access to computers at the University, whereas only (26%) stated that they have access to computers at the University.

- **Statement two: Years of prior Computer Experience**

As revealed and verified by table and bar chart (4.1) above, slightly more than half of pre-service teachers (58%) have no prior Computer Experience.

- **Statement three: Type of ICT or Computer Qualifications**

As established and demonstrated by Table and bar chart (4.1) above, slightly more than half of the respondents (54%) do not have any computer or ICT qualification.

According to the outcomes obtained as a result for statements 1, 2 and 3, most of the grade four pre-service teachers at Sudan University, Faculty of

English Education have no access to computers at the University, have no prior computer experience and have no computer or ICT qualifications.

### Hypothesis Two

- The pre-service teachers of EFL can use Computer and Hardware Products for educational purposes.

To verify this second hypothesis question two is articulated:

### Question Two

- To what extent can pre-service teachers of EFL use Computer and Hardware Products for educational purposes?
- **Statement one: Frequency of Computer and Hardware Products use**

Table (4.16) Frequency of Computer and Hardware Products use

S	Computer and Hardware Products	Often	Sometimes	Never
1	Total	246	182	172
2	Mean	20.5	15.16	14.34
3	Percentage	41%	30.32%	28.7%

Overall, the majority or (71.32%) from the total number of pre-service teachers indicated that they frequently use computer and hardware products for educational purposes. Nevertheless, this frequency decreased to (28.7%) of respondents who established that they never use computer and hardware products for educational purposes.

- **Statement Two: Level of Computer and Hardware Products use**

Table (4.17) Level of Computer and Hardware Products use

S	Computer and Hardware Products	Can Use	Can with Help	Cannot Use
1	Total	276	173	151
2	Mean	23	14.4	12.6
3	Percentage	46%	28.8%	25.2%

Generally, the majority or three quarters (74.8%) from the total number of pre-service teachers specified that they are able to use computer and hardware products for educational purposes. Nonetheless, this frequency dropped to one quarter when (25.2%) of respondents established that they cannot use computer and hardware products for educational purposes.

In conclusion, the statements 1, and 2 and the 12 items listed, illustrated and analyzed at tables (4.16 and 4.17) were designed to find out whether pre-service teachers of EFL can use computer and hardware products for educational purposes or not. It is obvious that the overwhelming majority of EFL pre-service teachers at Sudan University can use computer and hardware products for educational purposes. As displayed by their frequency and level of computer and hardware products use.

### **Hypothesis Three**

- The pre-service teachers of EFL can use software and communication services for educational purposes.

### **Question Three**

- To what extent can pre-service teachers of EFL use Software and Communication Services for educational purposes?

- **Statement one: Frequency of Software and Communication Services Use**

Table (4.18) Frequency of Software and Communication Services Use

S	Software and Communication Services	Often	Sometimes	Never
1	Total	267	235	96
2	Mean	22.3	19.6	8
3	Percentage	44.6%	39.4%	16%

Generally, the vast majority (84%) from the total number of pre-service teachers indicated that they frequently use software and communication services for educational purposes. Nevertheless, this frequency dropped sharply to (16%) of respondents who established that they never use software and communication services for educational purposes.

- **Statement two: Level of Software and Communication Services Use**

Table (4.19) Level of Software and Communication Services Use

S	Software and Communication Services	Can Use	Can with Help	Cannot Use
1	Total	304	187	109
2	Mean	25.3	15.58	9.08
3	Percentage	50.6%	31.2%	18.2%

Overall, the vast majority half or (81.8%) of the pre-service teachers indicated that they can use software and communication services for educational purposes. Nevertheless, this frequency fall to (18.2%) of respondents who established that they cannot use software and communication services for educational purposes.

Generally, the statements 1, and 2 and the 12 items listed, illustrated and analyzed at tables (4.18 and 4.19) were designed to find out whether pre-service teachers of EFL can use software and communication services for educational purposes or not. It is obvious that the overwhelming majority of EFL pre-service teachers at Sudan University can use software and communication services for educational purposes. As displayed by their frequency and level of software and communication services use.

#### **Hypothesis Four**

- The EFL pre-service teachers trust their abilities to effectively implement and integrate the wide range capabilities of ICT into their current learning approaches and future classrooms contexts.

#### **Question Four**

- To what extent can pre-service teachers of EFL implement and integrate the wide range capabilities of ICT into their current learning approaches?

Statements 1, 2, 3,4,5,6, and 7 were formulated to prove hypothesis four.

- **Statement one:** I am interested in implementing ICT in my learning approaches.

Apparently, almost three quarters of respondents (74%) expressed their agreement with the first statement, whereas (8%) disagreed and the rest of the responses (18%) were not sure.

- **Statement two:** I enjoy implementing ICT in my learning approaches.

Mostly, all respondents (84%) enjoy the implementation of ICT in their learning strategies, on the other hand (12%) of the respondents were unsure and only (4%) of the respondents indicated their disagreement with the statement.

- **Statement three:** I feel confident/ satisfied in implementing ICT in my learning approaches.

Nearly all, or (80%) of respondents indicated that they feel confident/ satisfied in implementing ICT in their learning strategies. At the same time, percentage dropped to only (8%) disagreed with the statement, however (12%) who were not sure

- **Statement four:** I am looking forward to integrate ICT in my teaching techniques.

The vast majority of respondents (86%) agreed that they are looking forward to integrate ICT in their teaching techniques; only (10%) disagreed while only (4%) were not sure.

- **Statement five:** I am Interested in integrating ICT in my teaching techniques.

According to the given data, more than three quarters (78%) emphasized their agreement with the statement, while (10%) disagreed and the last (12%) were not sure.

- **Statement six:** I am sure that I can integrate ICT in my teaching techniques

Slightly less than three quarters of respondents, (72%) agreed that that they can integrate ICT in their teaching techniques. However, numbers tended to fall in the disagreement when only (8%) showed their disagreement with



the statement, whereas (20%) of respondents were not sure about their confidence.

- **Statement seven:** I am sure that I can integrate ICT in my teaching techniques in the future.

It is obvious that the vast majority (86%) of respondents agreed that they could integrate ICT in their teaching techniques. However, only (2%) disagreed with the statement, whereas (12%) were unsure of their response

All in all, statements 1, 2, 3, 4, 5, 6, and 7, were phrased to elicit whether EFL pre-service teachers at Sudan University can effectively implement and integrate the wide range capabilities of ICT into their current learning approaches and future classrooms contexts or not. According to the illustrations and analysis presented above, it is obvious that respondents exhibit high ICT Self-efficacy levels. This feedback is completely consistent with hypothesis four.

### **Hypothesis Five**

- Pre-service teachers of EFL who have higher levels of self-efficacy can adopt suitable instructional principles in their classrooms.

### **Question Five**

- To what extent can the self-efficacy of pre-service teachers of EFL affect the adoption of suitable instructional principles in their classrooms?
- **Statement one:** Efficacy in Student Engagement (Items: 1, 2, 4, 6, 9, 12, 14, 22)

Three quarters (76%) from the total number of pre-service teachers reported that they could have an effective positive impact to motivate students who show low interest in schoolwork. Additionally, (18%) of respondents assured that they can have some influence. Nevertheless, only (6%) admitted that

they cannot you do anything to get students to believe they can do well in schoolwork.

- **Statement two:** Efficacy in Classroom Management (Items 3, 5, 8, 13, 15, 16, 19, 21)

The vast majority of respondents (81%) guaranteed that they could have a powerful influence to control disruptive behavior in the classroom and calm disruptive or noisy students. Furthermore, (11%) of the pre-service teachers declared that their influence is limited to some extent. This number dropped to only (8%) of respondents who established that their power is very little, admitting that they cannot you do anything to manage their classroom.

- **Statement three:** Efficacy in Instructional Strategies (Items 7, 10, 11, 17, 18, 20, 23, 24)

Three quarters of respondents (76%) from the total number of pre-service teachers detailed that they can update their instructional strategies, provide explanations and implement alternative teaching strategies. Moreover, (18%) of the respondents specified that they will have some influence in tailoring and changing their teaching strategies to suit students need.

Nevertheless, this ratio decreased to (6%) of respondents admitted that they cannot change their instructional strategies or give any examples when students are confused.

## **4.9 Summary**

This chapter has focused on analyzing, displaying and discussing the findings extracted through the method of collecting data, which has been applied to this study, (i.e. the questionnaire and interview). The flowing chapter will provide a summary of results and the conclusions of the study.

# CHAPTER FIVE

## Conclusions

### 5.1 Summary of the Study

The main objective of the study is to identify the prospective role of computer access at University, ICT expertise and related computer qualifications in the development of pre-service teachers' self-efficacy. Another objective is to examine pre-service teachers' ability to use ICT Hardware Products, Software and Communication Services effectively and integrate them into their current learning approaches and future classrooms contexts. One more objective is to identify to what extent the self-efficacy of pre-service teachers of EFL can affect the adoption of suitable instructional principles in their classrooms. For the purpose of this study, data was collected from (50) pre-services teachers using a questionnaire. Responses were analyzed using a statistical package for social studies (SPSS); in addition to that, the social cognitive theory was used as a framework to measure the self-efficacy level of the EFL pre-service teachers. As for the teachers interview, seven respondents participated in the interview and the descriptive method was used to analyze their feedback.

### 5.2 Findings

Findings of the study indicated that:

1. A limited number of the EFL pre-service teachers have access to computers at University. Adding to that, they do not have sufficient prior computer experience and they do not have adequate computer or ICT qualifications.
2. It is also confirmed that the vast majority of EFL pre-service teachers can use computer and hardware products for educational purposes.
3. Results also assured that the overwhelming majority of EFL pre-service teachers could use software and communication services for educational purposes.

4. Results also confirmed that almost all EFL pre-service teachers trust their ability to effectively implement and integrate the wide range capabilities of ICTs into their current learning approaches and future classrooms contexts.
5. EFL pre-service teachers exhibit higher levels of self-efficacy in Student Engagement, Instructional Practices and classroom management. Thereby it is established that grade four pre-service teachers at Sudan University, Faculty of English Education can adopt suitable instructional principles in their classrooms.
6. It is confirmed that accessing computers at University and ICT experience would enforce and support higher levels of ICT self-efficacy among EFL pre-service teachers.
7. EFL pre-service teachers retain the knowledge and skills to implement ICT capabilities into their current learning approaches and future classrooms contexts.
8. The availability of ICT infrastructure and tools, Internet and Intranet Services, and the management and maintenance of ICT resources are the most important concerns that may have an impact on successful implementation of ICT for the development of self-efficacy.
9. The most significant things that assist teachers to adopt ICT in teaching practices is to identify and recognize best ICT tools suitable for teachers' use, in addition to ICT tools, Courses and continues training.
10. Some professional development courses were recommended to develop the self-efficacy. These courses include; annual ICT specialized and advanced courses, Workshops, Seminars, CELTA and TESOL courses.

### **5.3 Recommendations**

Based on the findings of this study, the researcher proposes the following recommendations:

1. The Ministry of Higher Education should sponsor ICT training courses, workshops and seminars to motivate and encourage teachers to utilize ICT for educational purposes.
2. Universities, Colleges and teacher training Institutes should take positive steps in equipping pre-service teachers with ICT knowledge and skills required.
3. Internet service should be available at University offices and Libraries.
4. EFL students should be encouraged to use ICT at every aspect of their learning approaches, and then they should be enforced to process all University requirements i.e. (presentations, assignments, research, assessments, reports, etc.) through ICT.
5. Computer or ICT should be the official tools for all teachers' professional and development programs.

#### **5.4 Suggestions for Further Studies**

Based on this study, this section suggests areas for further future studies in the field of pre-service teachers' self-efficacy.

1. This study focused on ICT self-efficacy of pre-service teachers, further studies could consider the effects of ICT adoption in students' achievements.
2. Further studies could conduct experiments to measure effects of ICT adoption on the self-efficacy of pre-service teachers.
3. Further studies could involve different samples and conduct comparative studies.
4. More research is needed to investigate and highlight the nature of ICT use, teacher-training needs, and to know more about the attitude of students who resist ICT implementation process.

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# **APPENDICES**

## **Appendix (A)**

### **Cover Letter**

Dear respondents,

You are invited to participate in the Methodology of this research “Developing English Language Teachers’ Self-efficacy With Information and Communication Technologies” for a PhD thesis in English Language Education.

In this thesis, the field of study is applied to Sudan University, Faculty of Education. The results obtained from this thesis can be used as a basis for developing syllabus that meets the needs of students.

Your opinions are much valuable for this thesis as they help the researcher to investigate the opportunities and challenges of integrating ICT to develop teachers’ self-efficacy. You are kindly required to complete this Questionnaire/ Interview, which is designed to obtain information about the factors affecting perceived self-efficacy levels of pre-service English Language Teaching (ELT), with regard to ICT self-efficacy.

I would be so happy to answer and clear up any question you might have on the Questionnaire/ Interview. After completion the Questionnaire/ Interview, please return it to the researcher. Should you have any suggestions, please never hesitate to contact me through my email address, hereinafter.

I hope that you will find time to fill this questionnaire within 25 minutes. It is worth to assure you that the information will be kept confidentially for the purpose of research.

Thank you for your assistance

Sincerely,

Abdelmagied Elhadi Elamin

Email: magiedhadi@hotmail.com

## Appendix (B)

### Pre-service Teachers' Questionnaire

General Information			
Gender	Male ( )	Female ( )	Age: ( ) Years
Level of Education	B.A		

#### Pre-service Teachers' Computer Access, Experience and Qualifications

**Directions:** Put a (√) for whatever appropriate from the given variables

S	Items	Variables	Response
1	Computer access at the University	No Access	
		Have Access	
2	Years of prior Computer Experience	No Experience	
		Less than 2 Years	
		From 2 -3 Years	
		More than 3 Years	
3	Type of ICT or Computer Qualifications	No Qualifications	
		Short Courses	
		Diploma	



**Pre-service Teachers' Frequency and Level of Computer and Hardware Products Use**

**Direction:** Please indicate your frequency of use and level of application for the items listed below, by

Putting a (√) under the Number according to the given Scale

<b>Frequency of Use</b>	<b>1= often</b>	<b>2=Sometimes</b>	<b>3= Never</b>
<b>Level of Use</b>	<b>1= Can use</b>	<b>2= Can use with the help from others</b>	<b>3= cannot use</b>

S	Computer and Hardware Products	Frequency of use			Level of use		
		1	2	3	1	2	3
1	PC						
2	Notebook/ IPAD						
3	Mobile Phone						
4	CD/DVD Writer						
5	Flash Drive						
6	Printers and Scanner						
7	Webcam						
8	DVD Player						
9	Digital or Video Camera						
10	MP3 Player						
11	Voice Recorder						
12	E-dictionary (CD)						

**Pre-service Teachers' Frequency and Level of Software and Communication Services Use**

**Direction:** Please indicate your frequency of use and level of application for the items listed below, by

Putting a (√) under the Number according to the given Scale

<b>Frequency of Use</b>	1= Often	2= Sometimes	3= Never
<b>Level of Use</b>	1= Can use	2= Can use with the help from others	3= cannot use

S	Software and Communication Services	Frequency of use			Level of use		
		1	2	3	1	2	3
1	Educational Programs						
2	Word Processing Programs (E.g. Word)						
3	Spreadsheets (E.g. Excel)						
4	Presentation Program (E.g. PowerPoint)						
5	Music Programs (E.g. Win amp)						
6	Video Player Program (E.g. Windows Media Player)						
7	Web Browser (E.g. Internet Explorer)						
8	E-mail Program (E.g. Outlook)						
9	Chat Program (E.g. MSN)						
10	E-mail Groups (E.g. Yahoo/Facebook Groups)						
11	Web-based Forum						
12	SMS						

### Pre-service Teachers' ICT Self-efficacy Measurement

**Directions:** The purpose of this part is to determine how you feel about integrating ICT into classroom teaching. For each statement below, indicate the strength of your agreement or disagreement by ticking (√) one of the given five scales.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

S	Statements	Responses				
		1	2	3	4	5
1	I am interested in implementing ICT in my learning strategies					
2	I enjoy implementing ICT in my learning strategies					
3	I feel confident/ satisfied in implementing ICT in my learning strategies					
4	I am Looking forward to integrate ICT in my teaching techniques					
5	I am Interested in integrating ICT in my teaching techniques in the future					
6	I am Sure that I can integrate ICT in my learning techniques in the future					
7	I am Sure that I can integrate ICT in my teaching techniques in the future					

## Teachers' Sense of Efficacy Scale (Long Form)

**Directions:** This part of the questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below according to the given scale. Your answers are confidential.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Nothing	Very Little	Some Influence	Quite a bit	A great Deal

S	Teacher Beliefs	How much can you do?				
		1	2	3	4	5
<b>1</b>	How much can you do to get through to the most difficult students?					
<b>2</b>	How much can you do to help your students think critically?					
<b>3</b>	How much can you do to control disruptive behavior in the classroom?					
<b>4</b>	How much can you do to motivate students who show low interest in school work?					
<b>5</b>	To what extent can you make your expectations clear about student behavior?					
<b>6</b>	How much can you do to get students to believe they can do well in school work?					
<b>7</b>	How well can you respond to difficult questions from your students?					
<b>8</b>	How well can you establish routines to keep activities running smoothly?					

S	Teacher Beliefs	How much can you do?				
		1	2	3	4	5
9	How much can you do to help your students' value learning?					
10	How much can you gauge student comprehension of what you have taught?					
11	To what extent can you craft good questions for your students?					
12	How much can you do to foster student creativity?					
13	How much can you do to get students to follow classroom rules?					
14	How much can you do to improve the understanding of a student who is failing?					
15	How much can you do to calm a student who is disruptive or noisy?					
16	How well can you establish a classroom management system with each group of students?					
17	How much can you do to adjust your lessons to the proper level for individual students?					
18	How much can you use a variety of assessment strategies?					
19	How well can you keep a few problematic students from ruining an entire lesson?					

20	To what extent can you provide alternative explanation or examples when students are confused?					
21	How well can you respond to defiant students?					
22	How much can you assist families in helping their children do well in school?					
23	How well can you implement alternative strategies in your classroom?					
24	How well can you provide appropriate challenges for very capable students?					

## Appendix (C)

### In-service Teachers' Interview

#### Follow up Interview Questions

1. To what extent does the self-efficacy levels of Sudanese EFL teachers associated with computer access at University and with their ICT expertise in terms of prior computer experience and qualifications?

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2. To what extent can EFL pre-service teachers implement and integrate the wide range capabilities of ICT into their current learning approaches and future classrooms contexts?

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3. What are the concerns that may have an impact on the successful implementation of ICT for developing your self-efficacy?

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4. What will assist you to use ICT in your teaching approaches in the future?

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5. What types of professional developments are considered most valuable for improving the self-efficacy from teachers' perspectives?

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