

***USING INFORMATION AND COMMUNICATION TECHNOLOGY
AS A STRATEGIC TOOL IN ENHANCING STUDENTS'
PERFORMANCE IN ECONOMICS
A CASE STUDY OF THE STUDENTS IN GHANA
INTERNATIONAL SCHOOL (GIS)***

by

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**COMMONWEALTH EXECUTIVE MASTERS OF BUSINESS
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DECLARATION

I hereby declare that this submission is my own work towards the Executive Masters Of Business Administration and that, to the best to my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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ABSTRACT

The introduction of ICT has revolutionarized almost every aspect of human life including education. A plethora of studies has been conducted on the effects of ICT on teaching and learning. However, authorities have differed on the impact of ICT on teaching and learning. This study, therefore, draws on previous research evidence to identify relevant research strategies to address the gaps in our knowledge about ICT and students' learning. This study adopted the experimental research methodology whereby experiment and control situations are established and outcomes from the situations are compared and analyzed. ICT can be used in the teaching of Economics to build learners' confidence and to save time. Teaching and learning with ICT helps to support a range of learning styles. The research concluded that ICT can, indeed can be used as a strategic tool to enhance teaching and learning outcomes. The research, therefore, recommended that appropriate institutional plan, strict supervision and training as well as good motivation must be in place for maximum performance outcomes.

DEDICATION

I dedicate this project work my lovely children:

Joy Naa Dede-Obuki Adjei-Bisa,

Daniel Nii Mensah Adjei-Bisa
and

Lilly Naa Korkor Adjei-Bisa



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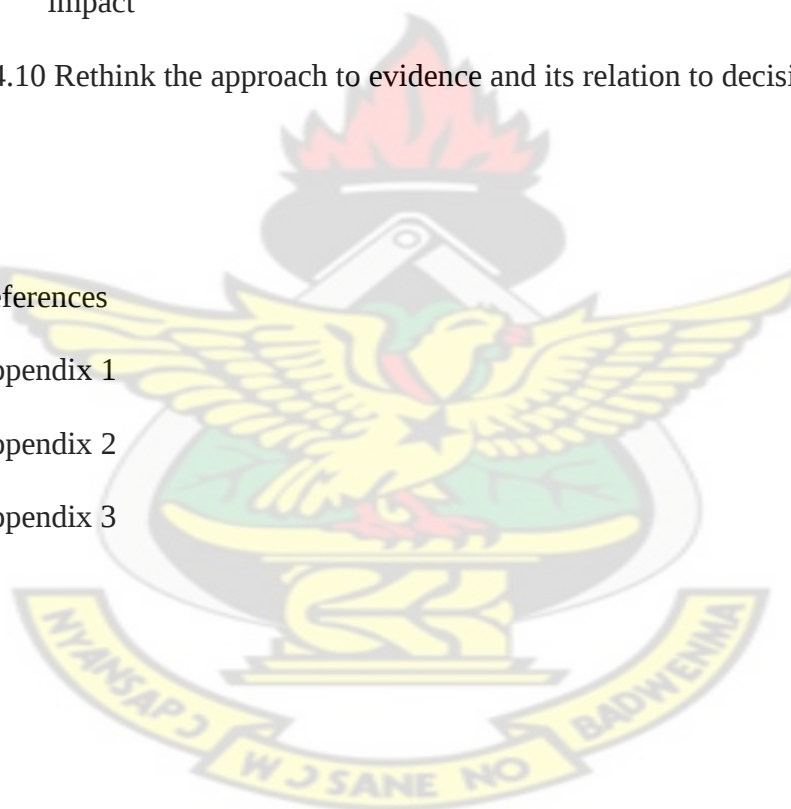
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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The world is experiencing a revolution in the dissemination of knowledge and in the enhancement of instruction, through the advancement of information and communication technologies (ICT).

According to ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries (Cochran-Smith, 1991).

ICT provides students with structured approaches to Internet research and develops students' search and research skills which are transferable across the curriculum. Broadband is a major factor in increasing collaboration between teachers. Embedded, reliable and high-capacity broadband in the classroom increases the quality and quantity of educational activities that can be undertaken. Interactive whiteboards make a difference to aspects of classroom interaction. (MacDonald, and Shields, 1998).

An Economics teacher engaged in the education of the child has to keep pace with the latest trends in using technology in the field of teaching. We have in our possession, in a

technological age a large number of modern teaching aids, which are used by people in every field of human endeavour. These teaching aids help in explaining various concepts and processes, which are not otherwise easy to explain. Some of these teaching aids are film projector, overhead projector, colour TVs, VCRs, epidiascopes, Multimedia projector, closed circuit TV systems. Apart from these, there is a variety of material like models, cassettes, charts, scientific apparatus and agricultural equipments, which are commonly used for teaching purposes.

The very nature of economics releases the teacher from the bonds of tradition and encourages him to make use of new methods of economic information in an effective and interesting way.

There are many different ways in which a trainer can make the learning experience more interesting and memorable for learners. One technique is the use of teaching aids. These are things used in the classroom to aid teaching and learning. They fall into two main categories: visual aids such as overheads; and interactive tools such as a video programme or resource pack. It is necessary to bear in mind that too much material and too many different themes can serve to confuse the class. Audio visual aids are a very important aspect of ICT in the teaching and learning of Economics, and it cannot be overlooked.

The usefulness of audiovisual aids as a strategic tool in the study of Economics has been proved in educational literature. Educational research indicates that students remember only 10 per cent of what they read, about 20 percent of what they hear and about 50

percent of what they hear and see. Thus, retention increases as the students get more involved in the learning process. Instruction devices which appeal to both sight and hearing have become indispensable teaching aids. (Sosin, 2004).

Visuals, in the form of diagrams, tables, graphs and pictorial representations are a vital part of any economic textbook, and the classroom board diagram is similarly important in the exposition of a great deal of theoretical Economics and its applications. In recent times, a lot of material have been developed that combine audio to these visual aids so as to increase interest, assimilation and retention.

Visual aids are visual representations which support presentations in the form of text, cartoons, graphs, illustrations, photographs. These can be OHP transparencies, handouts, flipcharts, posters, objects and the like. They help to break the monotony by providing a visual stimulant to reinforce what the learners are hearing.

The oldest technique for visuals is using a photographic slide projector. The more modern and flexible overhead projector enables presenters to design their own text as well as pictorial illustrations. The most high-tech version is the use of a data projector, a computer and presentation software such as Microsoft PowerPoint. This technique can be applied to every topic in Economics.

With overhead projection, the look of the presentation can be very professional as well as allowing individual tailoring that may keep the audience's attention. Certain audiences may expect presentation software but this option can be perceived as "flashy"

and is often very similar visually to every other speaker's presentations which can make it monotonous.

The internet has been recognized as an integrative and flexible strategic tool. One cardinal principle in teaching is to get the students involved and to make them busy. The use of audio visuals is able to get them actively involved even cognitively as they watch and listen to the material.

The internet serves as a source of free on-line textbooks, lecture notes, numerous illustrations and interactive teaching and learning opportunity. In schools where computer labs exist, the teacher may vary his or her lessons by choosing lecturers on-line under his guidance, listening to their lessons and engaging in the interactive assessment they provide. Even in the absence of this, a single computer with a speaker will serve the class.

The teacher can use the computer both as a teaching aid and as a tool for students' assessment by programming his questions on the computer for each student to use the computer to respond directly.

According to the European Commission, the importance of ICTs lies less in the technology itself than in its ability to create greater access to information and communication in underserved populations. (Sosin, 2004). Many countries around the world have established organizations for the promotion of ICTs, because it is feared that unless less technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already-existing economic gap between the technological "have" and "have not" areas.

Internationally, the United Nations actively promotes ICTs for Development (ICT4D) as a means of bridging the digital divide. (Lim, 1998).

ICT and the Internet for that matter is becoming an increasingly vital tool in our information society. ICT have the potential to enhance information dissemination, teaching and managing educational services and make them affordable and available anytime and anywhere. ICT also has great potential for facilitating the fulfillment of educational objectives and for enhancing solutions to educational problems.

Recognizing the advantages that ICT can bring in terms of meeting demands for improved education, educational authorities are under pressure to provide every classroom (if not every student) with ICT equipment, including computers and their accessories and connectivity to the Internet. Experience is proving, however, that acquiring the technologies themselves, no matter how hard and expensive, may be the easiest and cheapest step in a series of steps towards utilizing these technologies to improve teaching and learning.

More students in Ghana and all over the world are going online to conduct such day-to-day activities as learning, business transactions, personal correspondence, research and information gathering, and job searches. Each year, being digitally connected becomes ever more critical to economic and educational advancement and community participation in decision making. Now that a large number of students in Ghana regularly use the Internet to conduct daily activities, people who lack access to these tools are at a growing disadvantage. Therefore, raising the level of digital inclusion by

increasing the number of students in Ghana using the technology tools of the digital age is a vitally important national goal. In Ghana, the government is considering providing Internet access as part of the ICT program for schools in the country through the national fiber optics program.

1.2 Problem Statement

In the last several decades there has been a large-scale emergence and use of technology in every area of human activity, especially in the field of education. This has brought about a dramatic change in instructional methods for general education and particularly for the teaching and learning of Economics (Sosin, 2004). Existing research dealing with the effectiveness of the use of technology and the Internet on Economics education has not provided strong evidence to warrant the use of technology as an effective alternative to learning. A controversy or differences, therefore, exist in opinion with respect to the impact of ICT use on students' performance in Economics.

The Ghana International School introduced computer technology into its education set up in 1990. The purpose of its introduction is to help improve students' performance by granting them access to the facility and the internet. The problem has been the use to which students are putting the facility as well as its impact on students' performance. If the facility is properly used and well regulated, the immense opportunities that ICT offers could help improve the way students acquire relevant knowledge, develop appropriate skills and improve their academic performance.

Perhaps, even though the introduction of ICT into the school has aided and changed the way students approach their work, the question remains as to whether the facilities could not produce a much more improved performance in economics. The state of affairs where students put the facilities to non academic use such as visiting chat rooms, downloading music and visiting fun sites among others, for hours, must be changed. It does not therefore come as a surprise that many students spend a better part of the day in the computer laboratories.

The performance of students in their academic work depends on a number of factors. The provision of the right facilities must be followed by appropriate and right use to which the facilities are put. Furthermore, instructors are a key factor in students' performance and must be well trained to optimize the use of the ICT facility to enhance teaching (Henderson, 1985). The instructors also need to understand the various distractions and the challenges the ICT facilities, especially the internet, bring to students and how best to help avoid these problems.

At the pedagogical level, teachers are continuously choosing ICT and the internet, establishing its importance as a means of gathering importance, reference and for instruction. This explains the need to research into the impact of ICT on students' performance in the teaching and learning of economics in the Ghana International School.

1.3 Objectives

The primary objective of this study is to investigate the relationship between the use of ICT and students performance in the teaching and learning of Economics in the Ghana International School. Significantly, it verifies whether the effect of the use of ICT in the teaching and learning of Economics is negative or positive.

The problem in hand is to investigate for negative and positive impact of the ICT facilities and to find ways of enhancing the positive aspect and dealing with the negative impact. The issue, therefore, will have to handle ways of controlling students' behavior so as to help them use such facilities to their advantage.

1.4 Research Questions

Given the vital role of technology in today's world, this research will examine the value of effective technology use in classrooms with specific references to Economics instruction, particularly in the Ghana International School's programs, and curricula which runs a program from the University of Cambridge Ordinary and Advanced level examinations. It will attempt to answer the following questions that are essential to making technology use more effective in instruction:

1. Does the use of ICT necessarily have a positive impact on students' performance?
2. What does quantitative and qualitative research tell us about educational technology's effectiveness and the conditions and factors necessary for maximum effectiveness?

3. Why is educational technology important to the teaching and learning of Economics and what are the important considerations and resources that make technology use more effective?
4. Are there any other benefits to students from the use of ICT apart from improving academic performance?
5. What are the barriers that may affect the effective use of ICT to improve academic performance?

Overall, managing the changes in teaching (which surround and permeate implementation of technology use in schools) means dealing with student, parent, and institutional high expectations in student learning of high-level skills and content specifics as well as success on high-stakes assessments that tend to ignore many of those otherwise valued skills.

1.5 The Relevance of the Study

The significance of this research lies in the fact that it will contribute positively to the teaching and learning of Economics, redirect students and teachers to pay attention to the immense resources available for academic purposes through ICT to help integrate ICT and the internet appropriately into their teaching and learning.

Educational administrators could make use of the findings of the study to formulate policies to improve the teaching and learning of Economics in the school. In addition, the curriculum developers of the school could use the findings to introduce innovations in the Economics curriculum. This application could also be extended to other subjects

in the school to improve pedagogy and the curriculum as well as students performance. Again, it will inform administrators and teachers of the details of the problems students face in the teaching and learning of the subject and to find ways of modifying the traditional methods with ICT or discarding them.

The need to incorporate ICT in the teaching and learning today lies in the fact that ICT and Internet skills are important for employment and quality of educational life. Students will benefit through improvements in the teaching and learning situation. They will also improve their grades by adopting the appropriate methods that the internet offers to suit their learning styles.

On the level of employment, students will learn, develop and acquire appropriate knowledge and skills which they will need in their working life.

The study seeks to show the extent to which the findings would inform the making and designing of instructional policy and the appropriate application of ICT to enhance the optimal attainment of its educational and Economic objectives. Above all, it may generate certain controversies and inspire ideas that will generate further debate and research for the betterment of individual students, educational institutions and society in general.

The GIS regularly organizes training programs for teachers toward their professional development. Therefore, the findings will help the school to design and carry out relevant and appropriate training programs to help teachers to be abreast with the

increasing opportunities that ICT offers for the optimization of teaching and learning outcomes.

The study will further help impart to teachers not only the knowledge of using ICT in the preparation and delivery of their lessons, but also the ability to access the facility with all the opportunities it offers for personal development and to be up to date on what is happening globally in their subject areas.

Teachers would then have the opportunity to sign on to certain subject area sites and to be part of the teachers sharing ideas in their specialization. In this way, they would also contribute to the development of their subjects.

Significantly, this research will help identify the problems associated with the use of the ICT facilities by the students and to find ways of overcoming those problems. It will also help keep in step with the ever increasing opportunities and challenges associated with the use of ICT and to devise ways of maximizing the benefits of ICT as well as discovering new ways of improving students' performance.

Again, the research would help to discover the numerous access problems students have with the facility, the negative attitudes to its use, and other related problems that make the use of the facility counterproductive. Each of these problems would be looked at on its own merit and students helped to minimize them if not completely eradicating them.

Lastly, the findings would help students confront their own negative attitudes with respect to the wrong use to which they put the ICT facilities and to deal with them in order to derive maximum and intended benefits from the facilities.

1.6 Scope of Study

The study would focus on only students studying Economics at the Ghana International School. The study content of the curriculum will be the Cambridge International Examinations IGCSE and the advanced levels. Only the Ghana International School is chosen because it is the oldest of all the International Schools in Ghana and it has been offering both the subject and examinations much longer.

Only Economics is selected because it has about the highest number of students. Moreover, the experimental research method chosen involves such detailed information that all subjects cannot be considered for lack of adequate time.

1.7 Limitations of the Study

In the course of carrying out the research, a number of problems were encountered, which can adversely affect the quality of the results. In the first place, the school and the department did not have data on the subject matter.

Secondly, some of the students interviewed face to face made statements that were inconsistent with what they had written down on the response sheet. This therefore delayed the collation of data.

In addition, the usual application of ICT in the teaching and learning process made some students aware of the fact that a research was being carried out, so they appeared suspicious of the research. This might have affected the outcome of the research to some extent.

Lastly, since the impact of ICT is highly dependent on how it is used, the impact of a specific ICT application or device depends on the capacity of the teacher to exploit it efficiently for pedagogical purposes. Therefore, factors beyond the teacher's control can influence ICT uptake, examples of such facts being institutional cultures, leadership, the curriculum and assessment.

1.8 Organization of the Study

The research is organized as follows:

Chapter one gives a brief insight into the paper. It deals with the background to the study, the statement of the problem, the significance of the study and the limitations of the study. Chapter two focuses on the review of existing literature on the impact of ICT on students' performance in Economic. It goes further to present the controversies that exist on the findings of various researches with respect to the impact of ICT on students' performance. Chapter three looks at the methodology adopted for the research. It presents the research design, the population size, sampling techniques and the sources of data. Chapter four offers empirical research results and findings related to the use and impact of ICT on students' performance in Economics. It looks at the issue by focusing on a critical view of technology adoption in the education. In particular, through the

empirical research on the educational institution, the study tries to analyze students' perception of the use of ICT with reference to the study of economics.

Finally, chapter five looks at the summary, conclusion and policy recommendations.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

From the beginning of the computer age, educational researchers and practitioners have told us that for technology use to be successful in schools, it needs to be closely tied to school reform (Sosin, 2004). "Technology without reform is likely to have little value: widespread reform without technology is probably impossible" (Glennan and Melmed, 1995). In 2002, 100 high-tech executives met with the then President Bush (Jnr.) of the USA to discuss the future of technology. They indicated that improving education ranked next to national security and broadband Internet access was one of the most important considerations for improving economic growth in their companies, nationally and globally. Today, computers in schools are both a focus of study in themselves (technology education) and a tool for learning and teaching (educational technology). Rationales can be presented for both computer literacy and using computers as part of educational technology. The unavoidable conclusion is that successful improvement of technology, and Economics education is of high importance to our future. There is, therefore, the need for an extensive look at the forms of literature that exists on the teaching and learning of the subject of Economics.

2.2 Challenges of Teaching and Learning Economics

There are challenges in teaching and learning economics which, presumably, the application of ICT might help minimize. To avoid reducing learning to the development of mechanical skills, the nature of economics and the goals of economics education must be first laid out. There must be ‘the existence of shared narratives and the capacity of such narratives to provide an inspired reason for education’ (Postman, 1995). They provide the platform for discussing the challenges of teaching and learning economics. Postman further stated examples of the challenges confronting the teaching and learning of Economics as: the application of principles of Economics to day to day real life situations, the creation and sustenance of students’ interest, provision of global perspective to the subject and the need for current and relevant data. The challenges of teaching and learning Economics are directly related to the nature of the subject and the aims of studying it.

2.3 The Nature of Economics

Like all academic disciplines, economics has a specialized form of linguistic structure that produces distinct ways of thinking. These distinct modes of thought are embodied in the models used, and in the way, these models are compared with those elements of reality that the methodology of economics can adequately identify (Robbins, 1952).

The propositions of economic theory, as in the case of all scientific theories, are obviously deductions from a series of postulates. The chief of these postulates are all assumptions involving, in some way, simple and indisputable facts of experience,

relating to the way in which the scarcity of goods, which is the subject matter of economic science, actually shows itself in the world of reality. Therefore, the methodology of economics is essentially a matter of deductive analysis made better and easier by the use of ICT. For example, once a firm's objective is specified as profit maximisation, it follows as a matter of logic that the price–output strategy consistent with that goal is that which equates marginal revenue and marginal cost. It follows then that a profit-maximising monopolist will charge a higher price where the elasticity of demand for the commodity is greater than 1(one).

The deductive method involves the establishment of basic premises or assumptions related to the strategic behaviour and, by logic or reasoning, inferring their consequences.

The deductive method involves the establishment of generalization or principles on the basis of number of specific instances or facts.

Inductive reasoning becomes important as the economics course develops. Inductive reasoning starts not with a premise but with real-world facts, or sets of facts, and then proceeds to an explanation. For instance, by analyzing the homelessness in a country, students are given the opportunity to apply economic concepts such as inferior goods, shifts in curves, price ceilings, disequilibrium and conditions when a market ceases to exist (Wasson, 1998). Demand and supply curves, and their assumptions, may then be explained. All these require the use of ICT to access real life examples and data.

Given the role of inductive reasoning in economics, statistical support is necessary. Students must be equipped to handle real-world data with simple statistical techniques. It is only when such techniques are acquired that students will be able to cope with inductive reasoning in seeking explanations of real-world problems (Simkins, 1999). Moreover, students must 'deal with the interrelatedness of things (concepts and theories) and the overall balance between the larger picture and the smaller elements that go to make it up' (Wilkes, 1986). The teaching of economics must be directed towards deductive analysis and inductive reasoning. Students will then be able to take materials dealing with economic behaviour and phenomena, and reason through their own analyses rather than passively describing economic phenomena. The pedagogic emphasis should be on encouraging students to be inside the discipline, operating, in however limited a sense, as economists. (Sosin, 2004). Sosin further stated that the nature of Economics and the demand in the study of the discipline require access to a large amount of information, data collections, analysis and drawing of conclusions that will be relevant to our daily lives. The potential of ICT meets the needs of the discipline. By the use of ICT, economics educators are being faithful to the discipline and imparting economic training to their students. ICT affords both educators of economics and the students of the discipline the opportunity to use software that organizes, analyses, interprets, puts in graphical form large amount of data in matter of hours, rather than weeks.

2.4 Aims of Economics Education

Economics courses are run in educational institutions all over the world. Although their structure may vary, the aims of the courses are the same. The general aim is to provide students with adequate knowledge and understanding of the tools of economic analysis and of the situations and problems to which these tools are applied. This aim is then translated into assessment objectives of skills to be tested: knowledge and understanding, analysis, application, interpretation, evaluation, organization and presentation. The following quotation from the report of the Joint Committee for Economics Education captures the types of thinking inherent in the discipline, as well as the interconnectivity of economic concepts and ideas. “A capacity to understand the mutual interrelations and interdependencies of the various elements in an economics system and to take account of them in handling economic problems; a capacity to apply to an economic problem the models of economic analysis that are most appropriate to it; a capacity to follow and sustain an economic argument and to make logical inferences from given information”.(Joint Committee on Economics Education, 2006).

The above quotation suggests that to facilitate students to think ‘in an economics way’, the economics course must promote learner autonomy, and provide access to the world of economic concepts and ideas. In this paper, the definition of learner autonomy, which includes the provision of learner control, task orientation and critical reflection among students in the learning environment by Little (1991), is adopted.

It is an indisputable fact that learning depends on access to adequate facilities, informed teachers, illuminating materials, and so on. However, students also need to gain access

to the academic environment of economics. Laurillard (1993) claims that: ‘every academic subject faces this same kind of challenge to help students go beyond their experience, to use it and reflect on it, and thereby change their perspective of it, and therefore change the way they experience the world’. The cognitive capabilities that are appropriate to learning in the natural environment of the real world do not work well in the academic environment of the economics discipline. Learning in naturalistic context is synergistic with the context where the learning outcome is an aspect of both the situation and the relationship between learner, activity and environment. However, learning in an academic context requires learning about descriptions of the world; about a particular way of looking at the world. It is necessary to generalise from these experiences to obtain an abstraction, a description of the world that does not consist in doing the activity alone (Laurillard, 1987). For example, many students, through dictation of notes, may know that the market equilibrium price is determined by the intersection of supply and demand curves; but may perceive price as a means of exploitation by sellers. Such misconceptions are due to well-established precepts as students attempt to create order out of, and impose some sort of sense upon; their everyday experiences (Thomas, 1985). Economics teachers who want their students to think ‘in an economics way’ cannot assume that ‘economics as a substantive activity’ will suffice (Henderson, 1985): that is, the experiences of the economic system do not necessarily incorporate the form of comprehension that provides an access to the discipline.

Without autonomy and access, students are likely to be plagued by the problem of inert knowledge and to approach the discipline as bundles of facts and descriptions. As a

result, they may lack an appreciation of, and ability to participate in, the economist's way of thinking. Through ICT, students get the opportunity to experience economic forces at work through animation and simulation. This enhances thorough thinking and perceptive approach to the subject matter that enables students to understand the reasoning behind the concepts.

2.5 Learner Autonomy

The deductive nature of economics requires students to work through and understand the concepts or principles themselves. In most educational contexts, students are heterogeneous in terms of aptitudes, prerequisite knowledge, motivation, experience and learning styles. Many problems in economics courses are brought about by heterogeneity among students (Bach, 1990). Teachers are faced with the fundamental dilemma of where to pitch their lessons. If the lessons are pitched too high, the weaker students become hopelessly lost in the course. If the lessons are pitched too low, the brighter students are turned off as the course fails to stimulate them intellectually (Lage et al., 2000).

Moreover, Becker (1997) states that most instructional practices in economics courses tend to be 'consistent with a passive learning environment that does not engage students' and encourage them to take an active role in their own learning. Such an environment also does not promote critical reflection and independent learning on the part of students, and hence impedes learner autonomy.

ICT fosters learner autonomy as individual students are individually confronted with information that they can assimilate at their level or pace. Pace of learning differs for different students as their learning styles and abilities differ. ICT and ICT tools offer students the freedom to choose in such a way to match their learning styles and pace.

For decades, there had been a lack of delivery systems designed to adjust teaching to individual students in an economics class (Oliver, 1973; Wilkes, 1986; Saunders and Welsh, 1990). Advocates of ICT in economics education argued that ICT packages provide students with learner autonomy that is crucial to the learning process (Cullimore et al., 1996; Brooksbank et al., 1998; Lim, 1998).

2.6 Lack of Access to the World of Economic Concepts and Ideas

Most students use their everyday experiences to interpret the meaning of economic concepts. Although such experiences can help the development of economic thinking, many misconceptions are formed as a result. For example, students who perceive price as a means of exploitation by suppliers cannot articulate comparative static equilibrium analysis of the effect of changes in demand and supply.

Another problem is that students tend to equate knowledge to facts. However, economics is a way of thinking about problems, not a set of answers ready to be taken off the shelf. Keynes observes: ‘The theory of Economics is a method rather than a doctrine, an apparatus of the mind, a technique of thinking which helps its possessor to draw correct conclusions’ (Keynes, 1921). Students are expected to develop an ability to apply analytical tools in thinking independently about economic problems (Bach, 1990).

But students may not have experienced this particular version of learning. They may have problems in understanding economic concepts and principles, let alone in applying and evaluating them.

Another common problem is that students' expectations of the course are sometimes not met. Many students expect the course to provide them with clear-cut and simple answers to current socioeconomic problems. They often encounter a sense of disappointment when they cannot apply the theories and principles that they have learnt to real-world economic situations (Parks, 1999). For example, students experience difficulties in recognising the whole range of different kinds of allocation problem that can be explored by simple demand and supply analysis. This problem of reorganising the economic dimension to a problem is likely to become more acute as economic techniques become more complex.

2.7 Opportunities and Limitations of ICT in Economics Education

Research studies on ICT use in economics education have shown that ICT empowers students and allows them access to the discipline (Scheraga, 1986; Smith and Smith, 1989; Hallberg, 1996; MacDonald and Shields, 1998; Bredon, 1999; Katz, 1999; Simkins, 1999; Lage et al., 2000). Various types of ICT tool are used in economics courses: tutorial, testing, simulation/game, database, spreadsheet, and tools of local area network and the internet (Whitehead, 1996). Each provides opportunities for students to think 'in an economics way'.

Perkins (1993) cites various studies to assert that it is erroneous to assume that ‘as long as a support system is available, people will more or less automatically take advantage of the opportunities that it affords’. Daiute (1985) and Cochran-Smith (1991), in their studies of the use of word-processors in the classroom, observed that most students used them primarily to make minor stylistic, grammatical and spelling corrections and to get nice print-outs. It was the more experienced writers who were able to utilise the powerful editing mechanisms of the word-processor. They used it to plan their essays and make structural revisions that would have been done more painfully by hand.

In their research, Ford *et al.* (1995) state that most ICT packages do not have a significant effect on learning and teaching activities in schools because only a small proportion of their potential is used. The extent to which learning opportunities are actually taken up depends on where and how ICT is situated in the economics course. If ICT is treated as an add-on, isolated from all other aspects of the course, few, if any, of the opportunities will be taken up (Salomon, 1993).

2.8 Visualization and Animation

Since Wundt (1912) claimed that all thought processes were accompanied by images, numerous studies have been conducted to investigate instructional strategies facilitating the visual thought process (Levin and Lesgold, 1978; Mayer and Anderson, 1992; Mayer and Sims, 1994). The instructional effectiveness of visualisation and animation as devices for facilitating the visual learning process has been a primary issue in many recent ICT studies (Resnick and Johnson, 1988; Reiber, 1990; Reusser, 1993; Mayer et al., 1996). These representations offer effective ‘conceptual anchors’, ‘disclosing

important networks of relationships in a vivid and memorable way' (Perkins et al., 1995).

There are some economic concepts that are especially difficult to teach by lecturing and discussion – for example, the law of diminishing marginal returns and the multiplier effect. Many studies have shown that visualisation and animation in ICT packages, such as WinEcon, facilitate this understanding by affording access to the academic environment of economics ideas (Sloman, 1995; Hobbs and Judge, 1995; Soper, 1997; Brooksbank et al., 1998; Lim, 2001).

ICT packages, such as WinEcon, demonstrate exactly what happens through graphical animation and simultaneous changes in a table within the same screen. This allows students to see the connections between concepts by changing one representation that leads to changes in the other representations. It allows an almost unlimited number of possible scenarios as compared to textbooks or traditional modes of instruction without computers. These serve as objects for students to think about, and thus help students to develop certain aspects of economic thinking. The package further offers interactive quizzes to assess students and to offer explanations on what the correct answers should be. After this section, the quiz page reappears and the student is required to answer the questions again to master the lesson.

2.9 Impact of ICT on Students' Performance

There is no clear direct effect of ICT use and student performance. The direct link between ICT use and students' performance has been the focus of extensive literature

during the last two decades. Several studies have tried to explain the role and the added value of these technologies in classrooms and on students' performances. The first body of literature explored the impact of computer uses. Since the Internet revolution, there has been a shift in the literature that focuses more on the impact of online activities: use of Internet, use of educative online platforms, digital devices, use of blogs and wikis, etc.

This literature shows mixed results. On one hand, some research demonstrates that there is no evidence of a key role of ICT in higher education (Angrist and Lavy, 2002; Banerjee et al., 2004; Goolsbee and Guryan, 2002; Kirkpatrick and Cuban, 1998). On the other hand, some studies show a real impact of ICT on students' achievement (Kulik, 1999; Sosin et al., 2004; Fushs and Wossman, 2004; Talley, 2005; Coates et al., 2004).

2.10 ICT and Students' Achievement

Coates et al. (2004) surveyed three matched pairs of face-to-face and online principles of economics courses taught at three different institutions. The students' score in the Test of Understanding College Level Economics (TUCE) given at the end of the term is used as the measure of learning outcomes. After taking into account selection bias and differences in student characteristics, they report that the average TUCE scores are almost 15% higher for the face-to-face format than for the online format.

Anstine and Skidmore (2005) surveyed two matched pairs of on-campus and online courses, one in statistics, and the other in managerial economics. They report that after taking into account student characteristics and selection bias, students in the online

format of the statistics class exam scored 14.1% less than in the traditional format, whereas, for the managerial economics class, the test scores within both formats were not significantly different.

Navarro and Shoemaker (1999) surveyed a matched pair of on-campus and online sections of a class on principles of macroeconomics. The students self-selected the instruction format, with each section having approximately 30 students, and there was no difference in the demographic composition of each section. They used a simple comparison of means of test scores and reported no significant difference in academic performance between the two formats.

Terry, Lewer and Macy (2003) surveyed 240 students in a programme offering courses in the three formats of online, on-campus, and hybrid. Using a standard regression model where final exam score is the dependent variable and student characteristics are the independent variables, they reported that predicted examination scores for students in the online courses were significantly less than those of students in the on-campus and in the hybrid formats. However, with the comparison of exam scores between students in the hybrid and students in the on-campus classes there was no significant difference.

Brown and Liedholm (2002) surveyed students in a matched pair of online and face-to-face principles of economics course taught by the same teacher. They reported that exam scores, after taking into account the differences in student characteristics, were approximately 6% higher for the on-campus format than for the online format. They

attributed the relatively better performance in the on-campus classes to the benefit of in-person teacher-student interactions, and attributed the relatively poor performance of the students in the online class to the lack of self-discipline necessary for successful independent learning in the online environment.

Leuven *et al.* (2004) concluded that there is no evidence for a relationship between increased educational use of ICT and students' performance. In fact, they find a consistently negative and marginally significant relationship between ICT use and some student achievement measures.

Students may use ICT just to increase their leisure time and have less time to study. Online gaming and increased communications channels do not necessarily mean increased achievement. Many other explanations were presented.

Kulik's (1994) meta-analysis study revealed that, on average, students who used ICT-based instruction scored higher than students without computers. The students also learned more in less time and liked their classes more when ICT-based instruction was included. Sosin *et al.* (2004) constructed a database of 67 sections of introductory economics, enrolling 3,986 students, taught by 30 instructors in 15 institutions in the United States of America during the spring and autumn semesters of 2002. They found significant, but low, positive impact on student performance due to ICT use. But they showed that some ICT seems to be positively correlated to performance while others are not.

Fuchs and Woessman (2004) used international data from the Programme for International Student Assessment (PISA). They showed that while the bivariate correlation between the availability of ICT and students' performance is strongly and significantly positive, the correlation becomes small and insignificant when other student environment characteristics are taken into consideration.

The analysis of the effects of these methodological and technological innovations on the students' attitude towards the learning process and on students' performance seems to be evolving towards a consensus, according to which an appropriate use of digital technologies in higher education can have significant positive effects both on students' attitude and their achievement.

Attwell and Battle (1999) examined the relationship between having a home computer and school performance, for a sample of approximately 64,300 students in the United States. Their findings suggest that students, who have access to a computer at home for educational purposes, obtain improved scores in reading and mathematics.

Coates *et al* (2004) showed that students in on-campus courses usually score better than their online counterparts, but this difference is not significant here.

Li *et al* (2003) pointed out: "First, web-based instruction presents information in a non-linear style, allowing students to explore new information via browsing and cross-referencing activities. Second, web-based teaching supports active learning processes

emphasized by constructivist theory. Third, web-based education is enhanced understanding through improved visualization and finally, the convenience, it could be used any time, at any place”.

Clearly, then, there is lack of consensus among authorities in the field on the issue that the application of ICT to the teaching and learning of Economics necessarily lead to improved performance.



CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter deals with the research methods used for this particular study. In other words, the chapter on research methodology which covers areas such as:

- Research design
- Population and sample
- Research instrument
- Procedure for data collection

3.2 Research Design

The appropriateness of a design is also associated with a number of across-the-board concerns that affected the research from the beginning to the end.

The objective of this study is to obtain information from students of the Senior Secondary School in the GIS concerning the use of ICT and the extent to which it has affected their academic performance. From the information so obtained, it could be assessed whether ICT, as a means of teaching and learning, is making any significant impact on students' achievement in Economics.

The sample unit was the various selected Economics students in sets ranging from form 4 to upper 6. The sample frame was therefore the selected Secondary School students in the GIS offering Economics for the IGCSE and the A levels. The sets are designed in such a way as to ensure that 'weak' and 'strong' are fairly represented. The experimental research method was adopted by ensuring that the research was conducted according to

the class divisions done by the school. These divisions are balanced in that it took into consideration learning abilities of students, their learning styles and past academic performances.

The experimental design was chosen as an educational technique because the research is relatively harmless. To further ensure that students did not influence the research outcomes, they were not initially informed that a study was being carried out. The only information students had was that they were going to be tested on the ICT assignments given. First of all, the work schedules were divided into 50% under controlled situations and the other 50% under experiment. The experiment situations used ICT and the controlled used no ICT or the traditional method. The school has put students in each form into groups. These group called ‘sets’ which are “statistically equal”, meaning that, the selection into the sets was done with the knowledge of the population characteristics. This ensured that matching occurs where any extreme case in one group had a match or counterpart in the other group.

3.3 Population and Sampling

The population on which the study is based on is the Senior Secondary section of GIS comprising 186 students offering Economics in forms 4, 5, lower 6 and upper 6. There are three groupings called ‘sets’ within each form that is offering Economics. These sets are composed to reflect every level of students’ performance in general and in the subject of Economics in particular.

This population was taken out of the Ghana International School’s population of 1,153 students. This larger population is made up of students from about forty (40) different

nationalities offering various subjects under the Cambridge International Examinational curriculum. The school starts from nursery at the age of four (4) to class six (6) making up the junior school. The senior school starts from form one (1) to upper six (6) of an average age of about 18 years. In selecting students to take Economics, the school considers abilities in mathematics, ICT and English, taking into consideration their strength in writing and analytical skills. This is done because these qualities are prerequisites to the study and performance of students in Economics. Furthermore, students are given up to about half the first term to settle in their elective subjects or to change them.

A Stratified Sampling technique was used in the selection of the sets according to the Cambridge stratification rules. Stratification is the process of dividing members of the population into homogeneous subgroups before sampling. The strata should be mutually exclusive: every element in the population must be assigned to only one stratum. The strata should also be collectively exhaustive: no population element can be excluded. Such a sampling method of selecting the membership of the sets in Economics made it easy to use ICT in one situation and traditional methods in another without the need to create experiment and control groups. This helped to create experiment and controlled situations for all the sets with the Economics classes. Since the sets within the class are composed in a balanced way to reflect all levels of students' competence, each set was very representative. In this research, for each item investigated, such as test, class work, home work and projects, there was a control and experiment situations each making up 50% of all the work carried out with all the sets.

3.4 Research Instrument

The researcher conducted a survey using research instruments such as interviews, observations and questionnaires.

The research questionnaire was used to extract information such as access to internet, the frequency of internet use, the impact of the use of the internet and method of study preferred by students. It also contained details as students' distractions while using the internet.

The steps taken in obtaining information involved observation, then to interviews and, finally, questionnaires. The observations informed the content of the interviews and the questionnaires were used to confirm earlier findings and to obtain new information relevant to the study.

3.5 Procedures for Data Collection

The research relied on both primary sources of data in the actual research and secondary data in the literature review, which included external sources of data for the study.

The secondary data was basically what has been documented in the literature on the subject matter. The data are from both domestic and foreign sources since the students involved are being prepared for the Cambridge International Examinations. Another reason for the use of international data is that the students involved are of many and different nationalities and have access to world class ICT facilities of international standard both at home and in the school. Furthermore some students are on short term

which may last just a year and then they move to other countries. Other secondary source of data included books, articles and school, national and international reports on the subject matter.

The primary data was gathered from the students' records and questionnaires that were given out and answered by the students involved in the research. Recorded observations by the researcher also served as a source of primary data, on which conclusions were drawn.



CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The results of the research are presented in this chapter using statistical representations graphs, charts and tables.

4.2 Presentation of Data Collected

ICT is a very important tool for every human endeavor and particularly in Education. The research on the topics came out with numerous, relevant and interesting findings that contributes not only to already existing findings but raises a lot of researchable issues.

The data presentation was both in tabular, written and diagrammatic forms. The analysis were done in such a way that other factors were taken into considerations so as to capture other exogenous factors that have a relevant impact on students' performance. This was to isolate the impact of ICT from other factors that are likely to, or that actually affect teaching and learning outcomes.

4.3 Data Analysis

4.3.1 Background of Respondents

The composition of the 186 participants in the research is as follows:

Form four was 30%, form five 27%, lower six 25% and the upper six formers were 18% of the population. The participants were not selected by sampling, since the whole population of students offering Economics in the Ghana International School were involved. The reason for choosing the whole population was to avoid the situation where students would notice that a research was being carried out. By this way, the researcher hoped that the outcomes of the research would not be influenced by the students' deliberate modification of their behaviour. It was also to avoid giving undue advantage to students who were offering ICT for the Cambridge International Examinations and therefore are well informed about using various softwares with great ease.

The composition of the 186 participants who participated in the research based on forms is shown in the pie chart below:

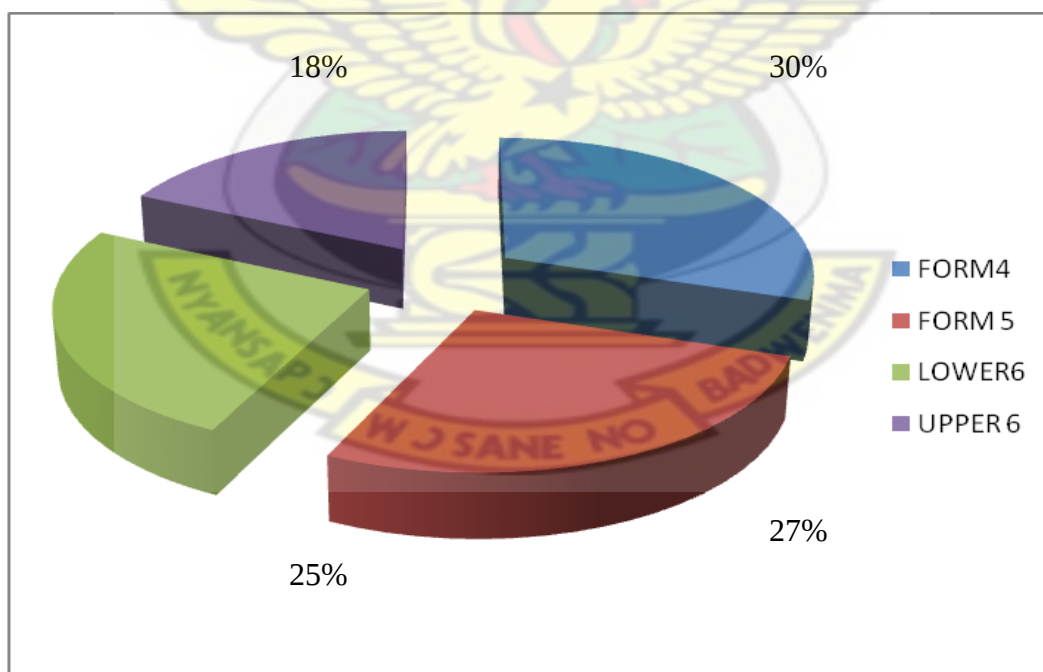


Figure 1: Composition of participants by form or class

The age of the students involved in the research ranged from 13 to 18 years. On the issue of nationality, 23% were Ghanaians whilst the rest 77% were of other nationalities.

4.3.2 Impact on Learning and Learners

The research tried to find out if it could be established that a causal link exists between the use of ICT and students' performance based on the analysis of the statistical relationship between the use of ICT and students' results in home work, class work and class tests. The impact of ICT on learning outcomes is summarized in eight statements:

ICT impacts positively on educational performance of students who were already serious and doing well. The results remain almost the same in both the research and control situations.

The only cases where poor students did very well were on projects that were given several weeks in advance, in which students were required to create power point, video, audio and visual presentations for the whole class.

Use of ICT improves attainment levels of students who were strictly supervised to use the facilities placed at their disposal.

In the work that required the use of ICT, given before a class test, students' performance showed significant improvement.

This can be explained by the fact that students were more conscious and really focused on the work given.

The bar graph shows the difference between the performance on those situations where ICT was used and situations where ICT was not used. The situation labeled NICT (no ICT) is the control situation, ICT is the experiment situation.

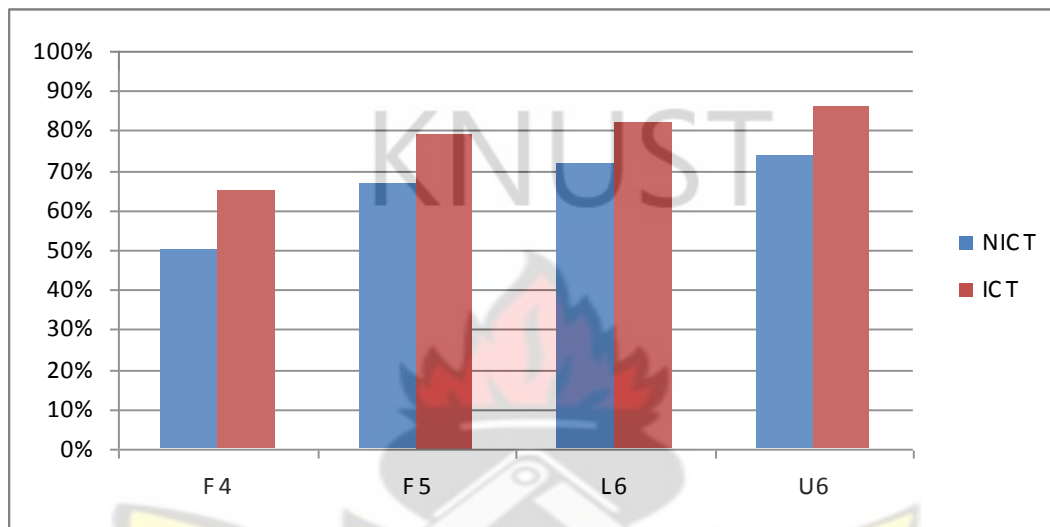


Figure 2: Students performance with and without ICT

Students with access to ICT at home did better than those without, and who had to use solely what the school provided.

It came to light that those with access to ICT at home were able to master well both the ICT skills and the homework given. This accounts for their improvement in performance. On the other hand, those situations where students were asked to use ICT in their work, they ended up finishing later than those situations where they did not use the facility. It was observed that once students got on the internet, they got interested in other things such as Hi-5, face book and online videos as well as play stations.

Investment in ICT impacts on educational standards mostly at higher levels such as the sixth form than at the lower levels such as form four. Age and class played a big role here, as 6th formers were more focused and knew what they were about than their younger form four and five counterparts.

Broadband access in classrooms results in significant improvements in pupils' performance in assessment outcomes. Introducing interactive exercises improved students' performance as against the nonassessment methods, ICT and students performance. Concerning assessment methods and the use of ICT as it affected students' performance; the outcome is illustrated in figure 3 below.

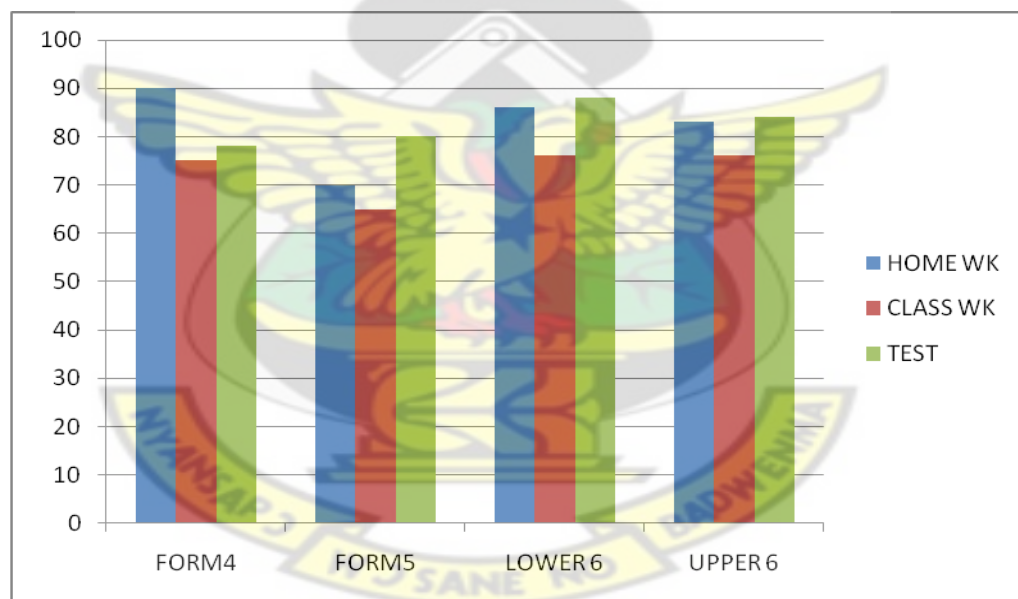


Figure 3: Assessment methods, ICT and students performance.

It can clearly be observed from the bar chart in figure 3 that students' performance in economics with the use of ICT was best with the class tests assessment method except

form four. In form four 90% was the average score for home work, 75% for class work and 78% for tests.

For the form five, 70% was students' average performance for home work, 65% for class work, and as high as 80% for the tests. Lower six had 85%, 75%, and 89% for home work, class work and tests respectively while Upper six formers had 82% for home work, 75% for class work and on tests, scored an average of 83%. This was due to the fact that, with the home work, they had more time to research after school in the computer laboratory and at home. They also had the opportunity to share ideas with their class mates. Class work took less time, but since the tests took a greater percentage of the assessment grading, the students were more serious than with the tests and they really prepared very well for them.

In addition, it can be seen that students attach different levels of seriousness to each assessment method based on its weight in the overall assessment. Time available for work also played a role as well as the availability of the facility to students both at home and school.

The interactive lessons gave greater motivation through the use of various animations. In this way, it improved their attention and understanding such that they were able to revise the lessons several times, till they mastered it.

Measuring ICT impact against students' attainment and improvement of their basic skills is one way of impact assessment, but one which assumes a fixed education system

in which school learning is primarily about the mastering of a pre-determined body of knowledge, skills and understanding.

Other findings led to the making of a further four more qualitative based statements about the impact of ICT on learning outcomes. They are mainly based on opinions of teachers, students and parents through the questionnaires given to students.

1. Pupils, teachers and parents believe ICT has a positive impact on pupils' learning. As many as 92% of students reported positive impact of ICT, while the other 8% said they did not think so, a lack of ICT skills really prevented some students from benefiting. In this case, one needed to have ICT knowledge, understand and develop the appropriate skills to apply the facility to Economics.

2. Pupils' subject-related performance and basic skills (calculation, reading and writing) improve with ICT. This is due to the fact that the computer provided immediate feedback as they tried exercises, and, therefore, mastered the calculations. Reading a wide variety of materials helps them to confront different styles and approaches to the subject matter. The computer also provided immediate feedback on spelling checks.

3. Teachers are becoming more and more convinced that the educational achievements of pupils improve through the use of ICT. This is with the reservation that the students are closely monitored.

4. Academically strong students' benefit more from ICT use, but ICT also serves better the weak students who were serious. Apart from ICT, other factors such as the level of seriousness of the students counted very much in the outcome.

4.3.3 Access to ICT at Home.

On access to ICT (internet) at home (AAH), it was observed that 98% form fours, 90% fives, 92% lower six and 91% upper six had access at home. The issue of access to the internet at home is shown in figure 4 below:

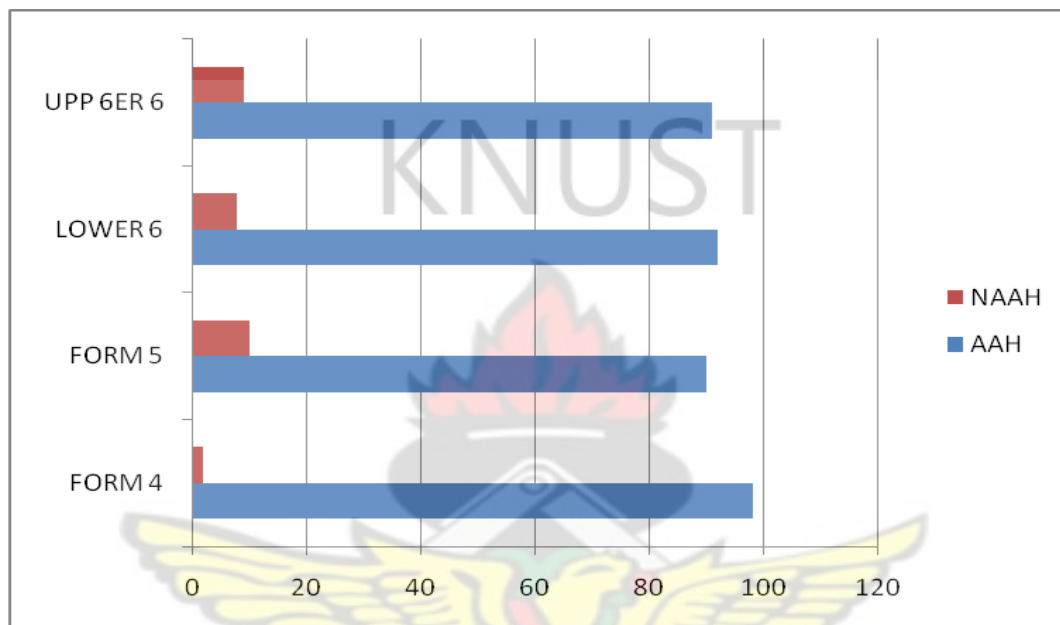


Figure: 4 Access to internet at home

4.3.4 Motivation and Skills

As high as 86% of students in the research said the use of ICT motivated them to work and helped them to be attentive when computers and the Internet were used in class.

However, in some cases, there was a substantial number of students, 10%, who denied that there was much of a motivational advantage of computer use in class. This response was related to the fact that some students were distracted once they were left alone and

not strictly supervised. Another reason was that some of those students did not possess the requisite skill for some of the software used. The remaining 4% did not respond to that particular question. The results of respondents are shown on the chart below:

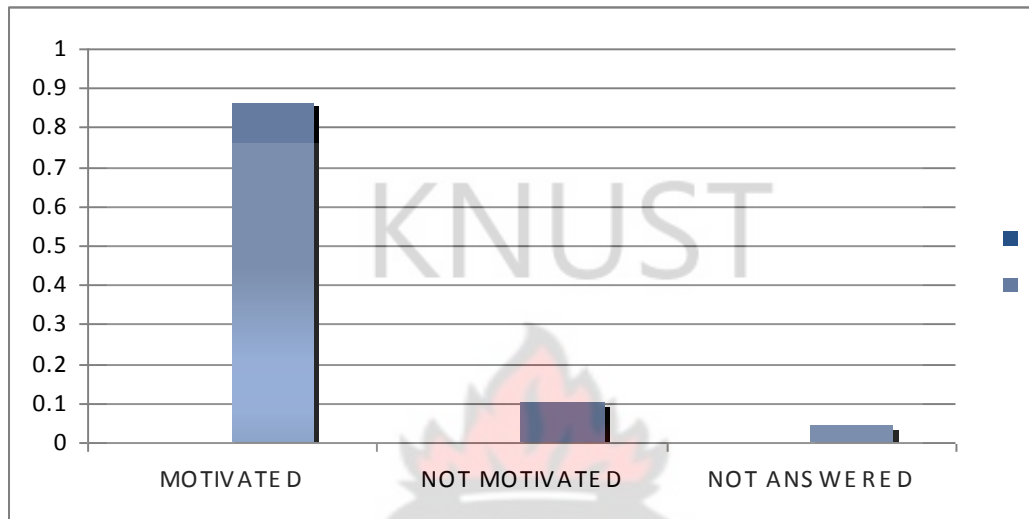


Figure 5: The use of ICT and students motivation

Since students' motivation went up with the use of ICT, it follows that ICT helped to promote and improve students' motivation to study the subject of economics. ICT has a strong motivational effect and positive effects on behaviour, communication and processing skills. This fact came to light when homework was sent into students' inboxes by e-mail and they had to finish and send the work back to the teacher for grading.

4.3.5 Independent Learning

ICT allows for greater differentiation with programmes tailored to individual student's needs. In the questionnaires, 92% agreed that the use of ICT enabled student differentiation whilst 6% did not agree. The reason was that they felt that they were

being considered to be substandard. The better students felt they were not treated fairly in the assessment and the grading scheme, since they had to do a much more difficult homework, class work and test. Those who did not answer this question made up 2% of the respondents.

The students stated that they did assignments more in their own way when using a computer because they had access to a wider range of assessment materials and softwares. Teachers considered that students work more in cohesion with their own learning styles, resulting in a favorable impact on both the academically strong and the weak students.

Pupils with special needs or behavioural difficulties gain in different ways from the use of ICT. Students assume greater responsibility for their own learning when they use ICT, working more independently and effectively. They said ICT offers learners assignments better suited to individual needs and makes it easier to organize their own learning, through the use of, for example, digital portfolios.

4.3.6 Team Work

The research came out with the fact that collaboration between students is greater when they use ICT for project work. In the course of the research and as a part of it, students were given some project works in groups and they were to submit it for grading. Collaboration was found to be better in the sense that they communicated with each other even when they went to their various homes and were able to put together better

material before the group or team meetings. In this way, the students were more informed, and they came out with better results during their group presentations.

Stronger teams were developed from strong ones and good teams from poor performing students. The results of the work of weak students put together exhibited great creativity in graphic designing and application of animations and visuals to explain Economic concepts. It came to light that working in teams help weak students to identify their strength and contribute meaningfully to the work.

4.4 Barriers to the Use of ICT

The research also identified barriers to ICT uptake in schools and this is discussed in this section. The factors that impede the successful application of ICT in teaching and learning of Economics are identified in the studies as the following.

4.4.1 Teacher-Level Barriers

Teachers' poor ICT competence, low motivation and lack of confidence in using new technologies in teaching are significant determinants of their levels of engagement in ICT. These are directly related to the quality and quantity of teacher training programmes. During the research some of the students of IT had to help the teacher to administer the software. Teachers were also found wanting when it came to the performance of very simple computer operations and in typing out their documents. Those who could design their own documents were limited to Microsoft word and had no idea about power point presentation and how to design them for pedagogical purposes. Some teachers who were competent thought that their workloads could not

permit them to afford the time required to design ICT materials for their lessons. Some, however, felt that ,when they found time to design all these, work would become easier and teaching more effective.

Teachers also felt that getting the facilities such as projectors would take away some of their precious time. Some of the teachers who used classrooms, where smart boards and projectors were already fixed, made good use of the facilities more often than not.

Most teachers who had some technical problems with the facilities felt it was a waste of teaching time to get technicians to fix the problem before continuing their lessons. Those teachers therefore leave out their audiovisuals and video components of the lesson to another time when the facilities would work well to achieve their objectives.

4.4.2 School Level Barriers

Limited access to ICT (due to a lack or poor organisation of ICT resources), poor quality and inadequate maintenance of hardware as well as unsuitable educational software are also defining elements in teachers' and students' levels of ICT use. Moreover, the absence of an ICT dimension in the overall schools' strategies and their limited experience with project-oriented activities supported by ICT, are decisive in determining levels of ICT use by students and teachers.

Another problem is the limited number of projectors and computers, since the computer laboratory served also as the IT classroom. This limited easy access and use of the

facility during the research. To be able to use the facility during the research, the researcher has to book the use of the computer laboratory and the facilities at least 14 days in advance.

The computer laboratories were almost always occupied for either ICT classes or fine art classes. This situation made it almost impossible for students who were free at a particular time to use the ICT facilities provided by the school. Some students also hinted that they would have liked to conduct research on topics treated as soon as the lessons were over, but this was not possible.

4.4.3 System-Level Barriers

In some cases, it is the educational system itself and its rigid assessment structures that impede the integration of ICT into everyday learning activities. In the course of the research, demands for certain paper work assessment materials introduced some amount of difficulty.

At certain times, the internet was either down completely or worked very slowly, thereby making the downloading of certain assessment materials difficult or impossible. This particular problem of the absence or slow internet wasted the time of those students who attempted to use the facilities. The ban on the use of mobile phones and laptops also did not enable student to access information that would have been very useful.

The impact of ICT is highly dependent on how it is used. The impact of a specific ICT application or device depends on the capacity of the teacher to exploit it efficiently for pedagogical purposes. Factors beyond the teacher's control influence ICT uptake, e.g. institutional cultures, leadership, the curriculum and assessment.

The research noticed a sharp 15% improvement in general performance for the term of the research compared to the other terms. Those who had access to computers at home were 98%, while 96% had their computers linked to the internet. Over 80% of them said that they use the internet at home 7 days a week. Those students who said they used the internet for the study of Economics were 54% even though they use the net for other purpose. Sixty percent said they were at times given work that demanded the use of the internet, whilst 40% responded in the negative. As many as 88% of the students confessed that they were tempted to do other things on the internet when they got the opportunity, even in the course of the research and only 12% were able to stay focused on their work. They said they rather checked their mails, browsing, on face book or just on other chat lines, watching football matches or playing games when the supervision was not very effective.

When asked how such distractions can be minimized or eliminated, 98% said supervision should be increased, 96% said there should be enough work to cover the time and as high as 99% said that access to other uses of the net should be restricted. Concerning attitude to the subject and the study of Economics, as high as 82% said their love for the subject, 90% had their understanding of the subject improved and 84% had

improved their performance in the subject. In terms of preference, as high as 98% said they preferred the use of ICT to the traditional method of teaching and learning, and only 2% were against it, for the fact they lacked the requisite IT skills to access the facilities. Those who were pro-ICT said that it gave better access to large amount of information, suitable information and strategies, and gave access to other people's opinions on a lot of issues in many countries. In terms of sequences of teaching and learning, 85% preferred that ICT should be used after the traditional method, 26% said it should be used before the traditional method, 84% said they should be used simultaneously with the traditional method and only 12% said ICT should be used alone.

The research revealed that the modal mark for all the class went up with the use of ICT in carrying out assessment in Economics. The use of ICT and the internet for that matter led to improvement in students' performance with strict supervision in the case of class work and tests. For form four, the modal marks in home work, class work and test respectively were in the following percentages: 85, 90 and 82. The standard deviations in the same respect were: 1.4, 2 and 2.5 respectively.

For form five, the modal marks in home work, class work and test respectively were in the following percentages: 80%, 81% and 78% respectively.

A general analysis of tables 1 and 2 in appendix 2 showed that modal marks went up when ICT was used as against when it was not used. This generally shows that ICT

improved students' performance and actually narrowed the gap between the average mark and the highest and the lowest mark.

KNUST



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five deals with the summary, conclusion and recommendations of the research organised into sections. The research brings to light the use of ICT resources as a tool for enhancing learning and academic performance with reference to students studying Economics at the Ghana International School.

5.2 Summary

The purpose for this research was to find out the effect of ICT on the teaching and learning of Economics in the Ghana International School, it was carried out to unlock the significance that is attached to the use of ICT as a tool and means in education.

The school was used for the study because of convenience and also the fact that the school has the ICT facilities and is running courses in IT for the Cambridge IGCSE and the Advanced levels. It is also because of the rich experience of the school in ICT practices in education and the fact that the Ghana international school was one of the first in the country to introduce the use of ICT in education and IT as an examinable subject.

The study was conducted through primary data collection where observations were carried out and questionnaires were designed and distributed to students at the Ghana International School and answers sought. In addition, secondary data was collected by reviewing some textbooks, magazines, periodicals, etc that had materials relating to the topic.

Analysis of the data collected and organized, showed that though the use of ICT in education is becoming widespread and a preference of both students and teachers, without conscious effort on the side of both and strict supervision, it can actually be counterproductive. Though students' perception of the use of ICT was satisfactory, there is the need to improve on the use and supervision to achieve maximum results. It is recommended that ICT needs to be used alongside other methods and means so as to reach all the students. System maintenance and sufficiency is recommended, and the need for strict supervision and continuous researches are also vital. The researcher also recommends that students should first be efficient in the requisite IT skills for particular programs in the subject so as to remove instances where ICT become a barrier instead of a bridge to higher performance. This will go a long way to boost students' confidence and achievement.

5.3 Conclusions

Internet enhancement of courses facilitates communication between the instructor and students, as well as easy access of information using the medium promotes the use of economic data and real-world applications to enhance the teaching of theory. Both

aspects of Internet use in economic pedagogy provide a real increase in the quality of education. The results of this study suggest beneficial effects of implementing Internet enhancements. The hypothesis that the Internet has no impact on student learning and retention is rejected in favour of a positive influence when scores on a standardized test and the final grade are considered as dependent variables. There were mixed results on the effect of Internet enhancements on student attitudes toward economics; senior students responded more favorably to economics with the use of the Internet, but no significant difference in mean attitude changes was apparent for the junior students.

The point of using the Internet is to add value to the classes that we teach and to allow us to meet the challenges of teaching. Our experience revealed that Internet use significantly enhances economic education for two reasons. First, contact time with students substantially increases through the use of the internet and discussion lists.

The instructor is able to communicate effectively with many students at the same time through the discussion list. Being able to communicate among themselves on the relevant theory and problems gives students an additional opportunity to focus on problem areas and seek help from each other. It is believed the added communications element goes a long way in fostering both thought and interest in the subject matter. Second, the Internet assignments and use of the Web allow students to observe the real-life implications of the economic theory they learn in class. The hands-on experience provides a better understanding of the subject matter and makes the learning process more active.

In addition, knowing how Internet use affects students as they progress through the entire economics program, rather than just one course, would be useful. Another interesting question is whether the Internet is more effective for both good and poor students.

Changing the design of the ICT tool to fit the learning environment in which it is used will certainly improve learning, but it is an expensive and time-consuming enterprise (Draper, 1998). Moreover, within the same learning environment, the learning needs of students may differ and the opportunities of the ICT tool may not be taken up. Although the opportunities and limitations of ICT have been discussed, the emphasis of the discussion has been on the learning and teaching activities in economics that support and are supported by ICT.

Teaching and learning activities have to be organized to take up the opportunities and address the limitations of ICT. The activities planned and organised have to ensure the continuity between ICT and non-ICT lessons, the employment of ICT and non-ICT tools to provide mutual support for one another, and the interactions between the tools and course participants. With a better knowledge of how these activities may be organised, economics educators are more likely to take up the opportunities provided by ICT to ensure that their students perform efficiently.

Students must also be fully aware and very much involved in the whole process so as to make cognitive acceptance easy and very manageable. This comes with the fact that the

student is the object of pedagogical mythology as well as the eventual outcome of improvement in performance.

5.4 Recommendations

The following recommendations result from the findings and pieces of evidence of the research as well as the review of literature involving books and articles by experts on the subject matter. The following are hereby recommended:

5.4.1 the Need to Plan for Transformation and For ICT

The school needs to support the transformation process and management of change, of which ICT is an enabler and amplifier. The key word is transformation. If the organisational and educational institutional context does not support new working methods, educational practices will not change. Taking into account that most teachers and students embrace new technologies in a step by step process, systematically but slowly, any change should be supplemented by process management and connected to realistic visions. This means allowing schools to experiment within given boundaries. The same holds true for more drastic changes, which are more difficult to achieve.

5.4.2 The need to include new competencies in the curricula and in assessment scheme

The research findings show that ICT impacts on competency development –specifically team work, independent learning and higher order thinking skills – that are not yet recognised by many education systems. These competencies should be formally

included in the curricula and ways of assessing them explored. They are important outcomes of a new and changed educational context.

5.4.3 The need to implement Continuous professional development

There is a need to implement new forms of continuous professional development in the school environment and as part of a culture of lifelong and peer learning in order to maximize the benefits of internet use.

New approaches to teacher and student training should be much more related to the concept of lifelong learning, knowledge sharing and peer learning. To be confident teachers and student must be able to upgrade their ICT skills and gain more knowledge in a much more active way than previously. Teachers and students have to become active shapers of their own learning process, which requires a professional environment and culture that allow teachers and students to do so. An experimental approach, using ICT in everyday practice, is an important factor in increasing teachers' pedagogical competence. Training programmes should be more school-based, student-focused and adapted to the particular needs of teachers and students and suitable to personal and subject -specific needs. Continuous professional and students' development should be in the foreground enabling teachers to learn how to upgrade their skills. Up-front sessions should be replaced by practice oriented projects in the practical learning environment. Such practical learning environment will enable students become part of the formulation of practical ideas about their learning and make useful input into the learning process. Teachers, being the drivers of the change through ICT, must be well equipped to offer

their best in shaping and controlling the useful process transforming learning through the use of ICT.

5.4.4 The need to Pmotivate and reward teachers to use ICT

As the research has shown, in addition to access to infrastructure and content and having the requisite skills, teachers' motivation is a critical factor in ICT adoption, but this is often neglected. Actions should be built into policies that encourage teachers to use ICT more – and more effectively. Policies in this area should include measures that raise the confidence levels of teachers such as, sufficient on-site support, appropriate in-service and initial teacher training in ICT. In addition, teachers should be given incentive, recognition and reward for the use of ICT. This can be done through appraisal schemes, intergrating into teachers' career paths, as well as offering time benefits for teachers engaged in ICT related projects).

5.4.5 The need to transform positive attitudes towards ICT into efficient widespread practice

There is the need for schools to capitalize on positive attitudes towards ICT. To achieve greater impact it is important that teachers underpin ICT use with a pedagogical approach. There seems to be a mismatch between the potential of ICT for learning and the actual teaching and learning approach of teachers and students. The majority of teachers and students think that ICT can improve learning outcomes, but they think that ICT has little or no impact on their methodology and learning strategy. This could be achieved by practical training, providing easy to use ICT based materials, peer learning

and peer sharing of experiences, securing reliable infrastructure, triggering teachers' knowledge in their subjects, pupil motivation, and easy access to research findings.

Such important research findings call for national and school level policy formulation and modification as well as classroom application to enable nations, schools, teachers and students to maximize their gains from ICT use and application.

5.4.6 The need for research and development

Constant and relevant research and development is highly recommended in a field that is ever evolving. Technology and its application are assuming an ever increasing complexity. More and more students are acquiring technology equipments such as mobile phones, iPods, laptops and ipads among others. The needs exist therefore to keep pace with this development and apply suitable tools and methods in teaching and learning and Economic in this case.

5.4.7 The need to consider context-sensitive and process- oriented research methods

In such a complex field as education and pedagogy, qualitative methods are necessary to investigate impacts. There is a need to go beyond pure observations and evaluate more concretely school contexts, learning situations and teaching processes to show under which circumstances ICT based activities can enhance learning and improve skills. This requires some degree of qualitative interpretation, in order to evaluate the causes of impact which have been observed. A holistic approach to identify impact is needed. What works for whom in what circumstances is what policy makers need to know.

Apart from research that shows benefit for ICT in subject, different research should be conducted to find out how ICT can positively influence the learning process. How ICT can support certain learning processes and thus raise attainment will require a process oriented approach in evaluating the impact of ICT for the future. Further research is needed into detecting the impact of ICT on these wider competencies and innovative pedagogical practices behind them.

5.4.8 The need to create closer links between research and practice

More fundamental, small-scale, focused research on specific ICT tools should be combined with research which is much more closely linked to practice: Ways forward are to develop a critical and reflective attitude amongst teachers or the teachers carrying out research themselves (with the assistance researchers) and involving schools in defining research questions.

Furthermore, the results of research should be made available to practitioners in a way that it is useful for them (evidence leaflets, easy access to research evidence and appropriate ways of communicating main research findings).

5.4.9 The need to encourage more qualitative trans-subject research into ICT impact

This research has gathered evidence relating to the impact of ICT on learning outcomes, teachers and teaching that has largely arisen in the school context. It has been assumed that the results are likely to apply in other subject areas but this may not be true.

International comparisons should move beyond baseline data and give more qualitative insights into ICT use by learners but even more by teachers.

5.4.10 Rethink the approach to evidence and its relation to decision making

The overview of the different research approaches already taken in that field can help policy makers to decide on a specific school approach suited to their education goals and context. However, policy makers should consider the following: Measuring ICT impact against students' attainment and improvement of their basic skills is one way of impact assessment, but one which assumes a fixed education system in which school learning is primarily about the mastering of a pre-determined body of knowledge, skills and understanding. ICT can be used in a variety of ways; the benefits of ICT therefore vary likewise.



REFERENCES

- Bach, G. L. (1990) 'What should a principles course in economics be?' in P. Saunders and W. B. Walstad (eds), *The Principles of Economics Course: A Handbook for Instructors*, New York: McGraw-Hill, pp. 39–43.
- Becker, W. E. (1997) 'Teaching economics to undergraduates', *Journal of Economic Literature*, vol. 35, September, pp. 1347–73.
- Brooksbank, D. J., Clark, A., Hamilton, R. and Pickernell, D. G. (1998) 'Views from the trenches: lessons from the introduction of WinEcon into a first year undergraduate programme', *Computers in Higher Education Economics Review*, vol. 12, no. 1, pp. 13–18.
- Cochran-Smith, M. (1991) 'Word processing and writing in elementary classroom: a critical review of related literature', *Review of Educational Research*, vol. 61, pp. 107–55.
- Cullimore, D., Brumfitt, K. and Atkinson, A. (1996) 'An evaluation of the strategies for integrating Information Technology in the teaching of Business Education within the 14–19 curriculum', in W. B. Walstad (ed.), *Secondary Economics and Business Education*, Hassocks, West Sussex: Economics and Business Education Association, pp. 17–28.
- Daiute, C. (1985) *Writing and Computers*, Reading, MA: Addison-Wesley.
- Ford, M. J., Poe, V. and Cox, J. (1995) 'Using CD-ROMs to develop automaticity and fluency in reading', in D. A. Willis (ed.), *Technology and Teacher Education Annual 1995*, Charlottesville, VA: Association for the Advancement of Computing in Education, pp. 136–9.
- Hallberg, M. C. (1996) 'POLICY: a computer program for student use in courses on economic policy', *Journal of Economic Education*, vol. 27, winter, pp. 310–19.
- Henderson, W. (1985) 'The objectives of economics education', in G. B. J. Atkinson (ed.), *Teaching Economics* (3rd edn), London: Heinemann Educational Books, pp. 32–46.
- Hobbs, P. and Judge, G. (1995) 'Economics: WinEcon – a new generation computer package for introductory economics', *Social Science Computer Review*, vol. 13, winter, pp. 410–21.
- Jih, H. J. and Reeves, T. (1992) 'Mental models: a research focus for interactive learning systems', *Educational Technology Research and Development*, vol. 40, no. 1, pp. 39–53.

Joint Committee on Economics Education (1977) *The Teaching of Economics in Schools*, London, Macmillan.

Katz, A. (1999) 'A computer-aided exercise for checking novices' understanding of market equilibrium changes', *Journal of Economic Education*, vol. 30, spring, pp. 148–62.

Keynes, J. M. (1921) 'Introduction to Cambridge Economic Handbooks', in D. H. Robertson (ed.), *Money*, London and Cambridge: Cambridge Economic Handbooks.

Lage, M. J., Platt, G. J. and Treglia, M. (2000) 'Inverting the classroom: a gateway to creating an inclusive learning environment', *Journal of Economic Education*, vol. 31, winter, pp. 30–43.

Laurillard, D. (1987) 'The different forms of learning in psychology and education', in J. T. E. Richardson, M. W. Eysenck and D. W. Piper (eds), *Student Learning: Research in Education and Cognitive Psychology*, Milton Keynes: Open University Press, pp. 198–9.

Laurillard, D. (1988) 'Computers and the emancipation of students: giving control to the learner', in P. Ramsden (ed.), *Improving Learning: New Perspectives*, London: Routledge, pp. 215–33.

Levin, J. and Lesgold, A. (1978) 'On pictures in prose', *Educational Communication and Technology Journal*, vol. 26, pp. 233–43.

Lim, C. P. (1998) 'The effect of Computer-Based Learning (CBL) support package on the learning outcome of low-performance economics students', *Computers in Higher Education Economics Review*, vol. 12, no. 1, pp. 19–26.

Lim, C. P. (2001a) 'Visualisation and animation in a CAL package: anchors or misconceptions?', *Journal of Computer Assisted Learning*, vol. 17, no. 2, pp. 206–16.

Lim, C. P. (2001b) 'The dialogic dimensions of a hypermedia learning package', *Computers and Education*, vol. 36, pp. 133–50.

Little, D. (1991) *Learner Autonomy 1: Definitions, Issues and Problems*, Dublin: Authentik.

Mayer, R. and Anderson, R. (1992) 'The instructive animation: helping students build connections between words and pictures in multimedia learning', *Journal of Educational Psychology*, vol. 84, pp. 444–52.

Mayer, R. and Sims, V. K. (1994) 'For whom is a picture worth a thousand words? Extension of a dual-coding theory of multimedia learning', *Journal of Educational Psychology*, vol. 86, pp. 389–401.

Mayer, R., Bover, W., Bryman, A., Mars, R. and Tapangco, L. (1996) 'When less is more: meaningful learning from visual and verbal summaries of science textbook lessons', *Journal of Educational Psychology*, vol. 88, pp. 64–73.

MacDonald, Z. and Shields, M. A. (1998) 'WinEcon: an evaluation', *Journal of Economic Surveys*, vol. 12, no. 2, pp. 221–31.

Oliver, J. M. (1973) *The Principles of Teaching Economics*, London: Heinemann Educational Books.

Parks, R. P. (1999) 'Macro principles, PowerPoint, and the internet: four years of the good, the bad, and the ugly', *Journal of Economic Education*, vol. 30, summer, pp. 200–9.

Perkins, D. N. (1993) 'Person-plus: a distributed view of thinking and learning', in G. Salomon (ed.), *Distributed Cognitions: Psychological and Educational Considerations*, New York: Cambridge University Press, pp. 88–110.

Perkins, D. N., Crismond, D., Simmons, R. and Unger, C. (1995) 'Inside understanding', in D. N. Perkins, J. L. Schwartz, M. M. West and M. S. Wiske (eds), *Software Goes to School: Teaching for Understanding with New Technologies*, New York: Oxford University Press, pp. 70–88.

Postman, N. (1995) *The End of Education: Redefining the Value of School*, New York: Alfred A. Knopf.

Reiber, L. P. (1990) 'Animation in computer-based instruction', *Educational Technology Research and Development*, vol. 38, pp. 77–86.

Resnick, L. B. and Johnson, A. (1988) *Intelligent Machines for Intelligent People: Cognitive Theory and the Future of Computer-Assisted Learning*, Pittsburgh: Learning Research and Development Center.

Reusser, K. (1993) 'Tutoring systems and pedagogical theory: representational tools for understanding, planning and reflection in problem solving', in S. P.

Lajoie and S. J. Derry (eds), *Computers as Cognitive Tools*, Hillsdale, NJ: Lawrence Erlbaum Associates, pp. 143–78.

Robbins, L. (1952) *The Nature and Significance of Economic Science*, New York: Macmillan.

Salomon, G. (1993) 'On the nature of pedagogic computer tools: the case of the Writing Partner', in S. P. Lajoie and S. J. Derry (eds), *Computers as Cognitive Tools*, Hillsdale, NJ: Lawrence Erlbaum Association, pp. 179–96.

Saunders, P. and Welsh, A. L. (1990) 'Lectures as an instructional method', in P. Saunders and W. B. Walstad (eds), *The Principles of Economics Course: A Handbook for Instructors*, New York: McGraw-Hill, pp. 111–26.

Scheraga, J. D. (1986) 'Instruction in economics through simulated computer programming', *Journal of Economic Education*, vol. 17, spring, pp. 129–39.

Simkins, S. P. (1999) 'Promoting active-student learning using the world wide web in economics courses', *Journal of Economic Education*, vol. 30, summer, pp. 278–86.

Sloman, J. (1995) 'WinEcon', *Economic Journal*, vol.15, no. 432, pp. 1327–46.

Smith, L. M. and Smith Jr, L. C. (1989) 'Microcomputer applications for teaching microeconomic concepts: some old and new approaches', *Journal of Economic Education*, vol. 20, spring, pp. 73–92.

Soper, J. (1997) 'Integrating interactive media in courses: the WinEcon software with workbook approach', *Journal of Interactive Media in Education*, vol.97, no. 2

Sosin et al (2004) integrating ICT into teaching and learning processes *Economic Journal*, vol.17, no. 442, pp. 27–48.

Thomas, L. (1985) 'The core of economics – a psychological viewpoint', in G. B. J. Atkinson (ed.), *Teaching Economics* (3rd edn), London: Heinemann Educational Books, pp. 47–71.

Wasson, R. R. (1998) 'Guidelines for a classroom presentation on homelessness: a demand and supply curve analysis', *Journal of Economic Education*, vol. 29, summer, pp. 212–26.

Whitehead, D. (1996) 'Economics and business education', in P. Gordon (ed.), *A Guide to Educational Research*, London: Woburn Press, pp. 197–228.

Wilkes, R. (1986) 'Towards a new paradigm for the teaching of economics', in S. Hodgkinson and D. J. Whitehead (eds), *Economics Education Research and Development Issues*, London: Longman, pp. 64–76.

Wundt, W. (1912) *An Introduction to Psychology*, London: G. Allen and Co.

APPENDIX 1

STUDENTS PERFORMANCE IN ECONOMICS USING ICT

FORM	MODAL MARK HOME WORK	MODAL MARK CLASS WORK	MODAL MARK TEST	SD HOME WORK	SD CLASS WORK	SD TEST
FOUR	85	90	82	1.4	2	2.5
FIVE	80	81	78	2	2.1	1.5
LOWER SIX	72	67	72	1.6	1.9	2.0
UPPER SIX	81	80	79	1.2	2	2.4

APPENDIX 2

STUDENTS PERFORMANCE IN ECONOMICS USING NO ICT

FORM	MODAL MARK HOME WORK	MODAL MARK CLASS WORK	MODAL MARK TEST	SD HOME WORK	SD CLASS WORK	SD TEST
FOUR	80	78	70	2	2.8	2.7
FIVE	72	70	65	1.8	2.4	1.9
LOWER SIX	70	67	60	1.7	2	2.5
UPPER SIX	80	78	70	2	2.3	2.8

APPENDIX 3

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY COMMONWEALTH EXECUTIVE MASTERS IN BUSINESS ADMINISTRATION

THE EFFECT OF THE USE OF ICT IN THE TEACHING AND LEARNING OF ECONOMICS-CASE STUDY OF GHANA INTERNATIONAL SCHOOL

QUESTIONNAIRE

(A) BACKGROUND OF STUDENT

1. Nationality.....

2. Age.....

3. Form

4. Set.....

(B) ACCESS AND USE OF THE INTERNET

1. Do you have a computer at home?

Yes

No

☐☐

2. If yes, is it linked to the internet?

Yes

No

☐☐

3. How many times do you use the internet in a week?

.....

4. Do you normally use the internet to study Economics?

Yes

No

☐☐

15. Are you sometimes given work that demands the use of the Internet?

Yes

No

☐☐

(C) THE IMPACT OF THE USE OF THE INTERNET

1. The use of the internet for your study of Economics has improved :(tick as many of the following effects as you like).

- ☐ My love for the subject
☐ My understanding of the subject
☐ My performance in the subject
☐ Others, please specify

.....
.....
.....

2. Which method do you prefer for your study and assessment?

(a) Traditional

(b) Internet

Explain your answer

.....
.....
.....

3. How will you prefer that the internet is used for instruction in Economics?

- ☐ Use after traditional method
☐ Use before traditional method
☐ Use simultaneously with traditional method
☐ Use the internet alone method

4. How frequently would you prefer that the internet is used for assessment in Economics?

- ☐ Always
☐ Sometimes
☐ Never

5. How do you use the internet for information on Economics and for drills?

- ☐ To a large extent
☐ To some extent
☐ Not really
☐ Not at all

(D) DISTRACTORS

1. How long did it take you to finish the test?

- ☐ 5-10 minutes
☐ 10-15 minutes
☐ 15-20 minutes
☐ 20-30 minutes

2. Which test(s) were you able to finish on time?

- ☐ Test 1
☐ Test 2
☐ Test 3

3. Which test(s) were you not able to finish on time?

- ☐ Test 1
☐ Test 2
☐ Test 3

4. Are you tempted to do any other things when you use the internet for test and instruction in Economics?

Yes

No

☐☐

5. If Yes, state what you are tempted to do?

.....
.....

6. How do you think such distractions could be minimized or eliminated?

- ☐ Increase supervision
☐ Enough work for the period
☒ Restrict access to other uses
☐ Others, please specify

.....
.....
.....
.....