Improving the Mouse Skills of Basic School Learners Using the Optical Mouse and Self Instructional Software. A Case of a Ghanaian Basic School

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Abstract: - The study came about as a result of poor performance showed by Bosofour R/C primary 6 learners’ during practical sessions. The general objective of the study is to examine the causes of learner’s poor mouse skills and provide an immediate solution to it. The research was conducted at Bosofour R/C primary school from the month of December, 2019 to June, 2020. The study was critically analyzed, though ICT is a core subject offered by all learners’ in the school, but due to time constraint, nature of the research and inadequate financial support, all the classes could not be covered but few were sampled to represent the whole school. The study adopted a random sampling technique for its appropriateness in reaching out to a large representative sample and generalization of the findings. The target population included five hundred and twenty (520) learners, comprising of two hundred and forty-eight (248) boys and two hundred and seventy-two (272) girls. Random sampling techniques was used to select twenty (20) learners’. Test, interview and observation were the main instruments used for data collection. The main design for the study was action research. The collected data was analyzed with the help of frequency distribution table, using pre- test and post- test as a method of obtaining data. The challenges of the study include; insufficient time for practical activity lessons, abstract methods of teaching, inadequate teaching/ learning resources and teachers’ pedagogical knowledge about the course. The results of the study showed that learners’ mouse skills may be improved by the use of optical mouse, self –instructional software and giving students enough time during practical sessions. It is therefore recommended that, Ghana Education Service should equip all Basic schools across the country with several types of educational software’s, in addition in-service training on ICT should be provided for all teachers, and finally, much time should be allotted for ICT practical activity lessons.

I. INTRODUCTION

Background to the study

Education is generally considered as the keynote to National Development in all societies especially in this technological era. It is a lifelong process in which innate abilities and talents of people both young and old, are brought out and developed. It is the most potent force shaping people’s knowledge, attitude, perceptions, skills and personalities (Antwi, 1992). According to(UNESCO, 2002) ICT has become within a few years, one of the cornerstones of modern society. Many countries now see grasping ICT and mastering the basic skills and concepts as one of the foundational education competencies, alongside reading, writing and arithmetic. Globally, most of the countries identified the education sector as frontline for the use of ICT to widen access to education, improve standard of educational delivered and reduce cost in the administration of the educational system as a way of increasing in provision of education. (Banks, 1999). The Government of Ghana seeing the need for Information and Communication Technology deemed it fit to reform the hitherto arts-biased courses so to raise the needed manpower to lead in the Nations technological advancement. The use of Information and Communication Technology in education adds value to teaching and learning, by enhancing the effectiveness of learning and it also plays a catalytic role in the classroom and beyond. It facilitates research and scholarly communication.

In computing, a mouse is a pointing device that controls the coordinates of cursor on your computer screen as you move it around. This study intends to shed more light on improving the mouse skills of Bosofour R/C primary 6 learners. The computer mouse is a device that moves a pointer on the computer screen, is mostly used for simple activities like opening a file, selecting and highlighting text, shutting down the computer and closing programs. The mouse is known to be the mostly used computer device and for one to be very good in using the computer he or she has to learn and practice more in order to improve upon his or her mouse movement skills.

The learners whom this research is conducted on are in basic 6 of Bosofour R/C primary. Bosofour is a community found in the Mampong Municipality of Ashanti Region, the school was named after the community. The people are primarily Akans who speak Asante Twi, predominantly members of this community are engaged in farming and in view of this majority of its members do not know the value of education for their wards, and has caused the learners inability to use the mouse in accessing the computer.

Students vary in their learning capacity and style, some more greatly than others so as to be classified developmentally disabled or learning disabled. Due to the problems, differences in learning style and capacity, computer
skills (mouse movement skills) may not be learned by mere observation or lecture but through designed instrument, hand-on experience and direct instruction by the teacher or facilitator.

Statement of the problem

Notwithstanding the fact that some learners are very good in using the mouse, it was noted during practice sessions that most of the learners in primary 6 could not use the mouse in preforming tasks such as double clicking, left clicking, dragging and dropping icons on the desktop, selection of text and locating the movement of the pointer on the screen of the monitor. Majority could not even hold the mouse properly. The researcher after observing this problem taught of using the optical mouse and self – instructional software to help improve the mouse skills of the learners, hence the study is to improve the mouse skills of Bosofour R/C primary 6 learners using the optical mouse and self – instructional software.

Purpose of the study

The rational as to why mouse skills should be taught is simple. Our society has become one that is geared towards technology. More than fifty-five percent of the workforces today uses computer in their daily job (United State Department of labour, 2003). Learners of today therefore need to know how to use the mouse properly and effectively if they want to be successful in the field of Information and Communication Technology. Therefore, the purpose of this study is to improve the mouse skills of Bosofour R/C primary 6 so that they will be able to use the computer effectively especially in the word processing and other computer application.

Bosofour R/C primary school consists of both boys and girls (mixed school). Insufficient time allotted for practical session and demonstration coupled with inadequate facilities (computers and its accessories) in the school is highly affecting the learner’s mouse movement skills. The general objective of this study is to improve the mouse skills of Bosofour R/C primary 6 learners. To achieve this broad objective, the following under listed specific objectives will be considered.

- Identifying the causes of learners’ inability to use the mouse.
- Designing practical activity lessons to improve on the mouse movement skills.
- Use the optical mouse to guide learners improve their mouse skills.

Research questions

The research questions that were adopted for this research work are;

1. What are the causes of Bosofour R/C primary 6 learner’s inability to use the mouse?
2. Will the use of practical activity lessons help improve the mouse skills of Bosofour R/C primary 6 learners?
3. How will the use of optical mouse guide learners of Bosofour R/C primary 6 improve their mouse skills?

Significance of the study

The results of the study will be beneficial to the Ghana Education Service, it will offer suggestions as to what to include in the computing curriculum regarding mouse skills and also the number of periods to be allotted for such lessons.

It is anticipated that the research findings would be useful to NOG’s and other stakeholders of education to encourage and provide resources that will interest learners pursue computing courses. The suggestion and recommendation would be made available to computing teachers to serve as in service training manual to broaden their skills, knowledge and experience.

The study will also help the school administration to monitor computing teachers and lesson in the school. Again, the study will be beneficial to other researchers who wish to research into this field of work, as it will serve as a roadmap for them to write their own. It will be of importance to learners of Bosofour R/C primary 6 and also useful to all students in basic schools of all standard, especially those who find it difficult in accessing the computer using the mouse.

Delimitation of the study

A study of this nature would have been conducted for all the primary schools in the Mampong Municipality of the Ashanti Region, however, due to limited financial resources and time it was only based on learners of Bosofour R/C primary 6. However, the study was narrowed to computing topic ‘Mouse skills’ specifically to improve the mouse skills of primary 6 learners of Bosofour R/C only.

Limitations of the study

It would have been of great interest to increase the sample of the study to cover other class or yet all primary schools in the municipality but due to truancy on the part of the learners, time at the disposal of the researcher and time allotted for computing on the time table was not enough to favor the intention and expectation of the study.

Organization of the Rest of the study

This section deals with how the rest of the chapters of the research on the study have been organized.

The second chapter is about review of related literature, it focuses on what others publications or researchers have said about the problem on which the researcher wants to solve.

The third chapter talks about the methodology employed by the researcher to solve the existing problems. It includes the research design, population and sample selection, research instrument and intervention processes.
The fourth chapter is made up of the presentation and analysis of data collected by the researcher for easy interpretation by other researchers.

The last chapter is a summary of the entire study, drawing conclusion and giving recommendation and suggestions for further research.

II. REVIEW OF RELATED LITERATURE

If students are to excel and do well in the field of ICT, they need to know how to use the mouse properly and effectively. Therefore, the purpose of this study is to improve the mouse skills of basic six (6) learners of Bosofour R/C primary school so that they will be able to use the computer with ease. This chapter elaborates on the review of what other researchers’ and scholars’ have said about the problem under study. The following are the subsections under which the research is presented; general view of the computer mouse, parts of a computer mouse, operations of the mouse, the optical mouse, challenges in the implementation of ICT in basic schools, features of the graphical user interface, pedagogy used in teaching ICT and the importance of ICT.

General view of the computer mouse

(hope, 2019) Define mouse as a device that moves a pointer on the computer screen. It acts like a finger allowing you to press buttons and select objects. Its name is derived from its shape, which looks a bit like the rodent mouse, its connecting wire that one can imagine to be the mouse’s tail, and the fact that one must make it scurry along a surface. The first prototypes of now-familiar device were invented by Douglas Engelbart in 1963 at Stanford research institute, since then he has inspired Tech companies such as Xerox, Apple, Microsoft and Logitech to invent millions of dollars in redesigning the form and function of the mouse. But despite evolution, computer users today handle the mouse in much the same way Engelbart did 40 years ago. Today the device is virtually on every computer as an ingeniously efficient and easy-to-use pointing device. The mouse translates the motion of your hand and buttons operations into an electronic signal to execute function such as clicking, dragging, pointing, and others on the computer screen.

The ability for an individual to point hands-on objects in the real world does not give one the ability to efficiently use the computer mouse pointer on the screen, and this has been proved as a common challenging issue that newbies face in mouse operations. Wang and Mackenzie (1999) stated that the patterns found in pointing with the hand to physical target may or may not follow the trends observed in pointing on a computer screen with input device. There are many differences between the cursor and motion. (Smith, Ho,Ark and Zhai, 2000) also commented that direct hand pointing to physical object is carried out with feedback of the hand position in the human arm. The cursor is used to point at graphical object on the screen, which does not have an absolute mapping with hand motion instead; the feedback is given through the eyes. Although initially conceived in the 1960s, a couple of decades passed before mice came into the mainstream.

Parts of the Computer Mouse

Figure 1

Today’s mice have two buttons, the left button and the right button, with a scroll wheel or scroll button in-between the left and right buttons. There are many types of mouse. These are; the optical mouse, trackball mouse, wireless mouse and mechanical mouse. A computer mouse is a handheld hardware input device that controls a cursor in a Graphic User Interface (GUI) and can move, select the text, icons files and folders. In the operations of the mouse, the index finger should rest on the left mouse button and your middle finger should rest on the right mouse button. To use the scroll wheel, move your index finger to the wheel. Remember the mouse
can be susceptible to small movements; therefore, consider these things when using the computer mouse;

1. Rest the heel of your hand on the surface behind the mouse and keep it on the surface when moving.
2. Press gently and quickly on the mouse button when clicking.
3. Do not twist or rotate the mouse and make sure that the ends of the mouse point forward and back on the mouse pad.
4. Grip the mouse gently with your thumb on one side and your ring and little finger on the other hand.

5. **Double-click**: Press and release the left mouse button twice in rapid succession without moving the mouse.
6. **Drag**: Press and hold release the left mouse button, and then move the mouse with the button still held down, and finally release the button.
7. **Click-and-hold**: Press and do not release the left mouse button.
8. **Click and drop**: begins with a click and then you drag an object to move it to another location or folder.
9. **Drag and drop**: drag on an object (select), then move the object to the desired place and drop thus release your hands on the mouse.

There are several common pointers that are seen in the operations of the mouse in both online and offline.

- The Arrow lets you point.
- The Busy symbol or hourglass means wait.
- The Cursor lets you type.
- The Hand lets you select a link.

Sources (Akron-summit country public library)

**Operations of the Mouse**

The following are some mouse operations that computer users need to know to use the computer effectively;

1. **Move over**: Put the mouse on an object on the desktop (screen) without clicking.
2. **Click**: Press and release the left mouse button without moving the mouse.
3. **Left-click**: Is the same as a click. Pressing the left button once.
4. **Right-click**: Press and release the right mouse button without moving the mouse: Issued to open menus, commands, cutting, copying etc.

5. **Double-click**: Press and release the left mouse button twice in rapid succession without moving the mouse.
6. **Drag**: Press and hold release the left mouse button, and then move the mouse with the button still held down, and finally release the button.
7. **Click-and-hold**: Press and do not release the left mouse button.
8. **Click and drop**: begins with a click and then you drag an object to move it to another location or folder.
9. **Drag and drop**: drag on an object (select), then move the object to the desired place and drop thus release your hands on the mouse.

The optical mouse was invented by Richard Lyon and was developed by Agilent Technologies which was introduced in the world in late 1999. The optical mouse uses a sensor to determine its motions; most optical mouse uses a small light-emitting diode (LED) that produce laser light to enable the movement of the cursor on the desktop. They don’t require a unique surface such as a mouse pad. It appears that the venerable wheeled mouse is in danger of extinction, the now-preferred device for pointing and clicking is the optical mouse. They are user- friendly and reliable.

**Challenges in the Implementation of ICT in Basic School**

Computer technology, in most developing countries including Ghana, is not at its peak as compared to the developed countries. Computer technology is applied in different sectors long time ago to enhance effectiveness and efficiency in various aspects including education sector.
fun and enjoyment they bring to learning. Studies by
Kersaint et al. (2003) found that teachers, who have a positive
perception towards ICT, feel more comfortable with using it
and usually exploit it in their teaching.

Features of a Graphical User Interface

Modern personal computers operating system, such
as Windows, Mac OX or Unix, present the user with a
Graphical User Interface (GUI) that requires the use of an
input device along with a keyboard to successfully navigate
and operate the system.

Graphical User Interface operating systems, such as Microsoft
windows features the following component;

1. **Pointer** - A symbol that appears on the display
   screen and that you move to select objects and
   commands.

2. **Pointing device** – A device such as a mouse or a
   trackball that enable you to select objects on the
   displayed screen.

3. **Icons** – Small pictures that represent commands,
   files or windows. By moving the pointer to the icon
   and pressing a mouse button, you can execute a
   command.

4. **Desktop** – The area on the display screen where
   icons are grouped is often referred to as desktop.

5. **Menus** – Most graphical user interfaces let you
   execute commands by selecting a choice from a
   menu.

According to Hall and Higgins (2004), pupils are very
enthusiastic about ICT implementation because of their
versatility in the classroom, multimedia capabilities and the
fun and enjoyment they bring to learning. Studies by
Brosoman, (1992), shows those 6-11 years old boys have
more positive perception about ICT implementation. Kay
(1992) reports also confirmed that girls are less positive about
ICT implementation than boys and enthusiastic about the
exploitation of programs such as word processing and
drawing. In terms of gender, Bardier and Light (1992) found
that girls do less technical tasks and do not sit as often as boys
in mouse usage. According to Barbie and Light (1992), girls
prefer a particular learning approach, which results in a
preference for ICT exploitation with specific characteristics.

Gakuo et al. (2010) say leadership play a key role in ICT
integration in education. Lack of training of teachers in
information technology skills is one of the significant
challenges hindering the implementation of ICT education in
primary schools. Pelgrum (2001) argues that inadequate
training of teachers on the use of computers in classroom was
one of the main challenges to smooth ICT integration in
schools. Mutongwa and Farrell (2007) contend that high costs
for acquisition and maintenance of ICT infrastructure are a
challenge that has continued to hamper adoption and
implementation of ICT in schools.

The pedagogy used in Teaching ICT

ICT teachers’ literacy is among the critical
conditions for the active exploitation of ICT in teaching and
learning. Although teachers play a crucial role in the
implementation and exploitation of ICT in schools, teachers’
inexperience in ICT knowledge and skills is likely to hamper
successful implementation (Pebble, 2003). Several studies
report that generally majority of teachers across the education
system are ICT literate (Jung, 2003), but has insufficient
pedagogical knowledge because most ICT in-service training
which seeks to promote the technical expertise of teachers in
isolation and has failed to link teacher’s knowledge to
exploitation of ICT as a pedagogical gadget in curriculum
implementation.

For teachers to effectively and efficiently exploit ICT
in their teaching, they need adequate pedagogical knowledge
for them to utilize and implement ICT curriculum in schools.

Literature reviews that primary school teachers still have an
inadequate educational understanding that is required for them
to be able to teach with technology successfully (Angeli and
Valanides, 2009). Most self- instructional software tutorial,
videos and exercise on mouse skills are in the form of mouse
oriented computer games to help learners. Mouse skills in
computer games can provide instant feedback on performance
scores to the gamer (pupil), they can track their performance
level and with time will become effective in using the mouse
for several operations. Doolittle, (1995) affirms that
exploratory, interactive games are excellent vehicles to be
embedded in curriculum content such as mathematics and
science concepts that may be hard to visualize or manipulate
with concrete materials.

The way a lesson is delivered must be noted, not only
that but the person instructing must be well vest in what he or
she is teaching. Besides, Scrimshaw, (1997) examines teachers’ role in the classroom with the computer. He argues that teachers’ need to teach the process of learning rather than its product. The development of skills needs to be supported using appropriate forms of software. This requires the explicit teaching ways, organizing cooperative activities involving computers, whether face-to-face, and groups around a single machine or through conferencing or email system.

Krysa,(1998) stated that ICT training should not be limited to teachers who teach computing but to all teachers on the use of computers. The need for ICT training is explained by the fact that most of the presently recruited teachers received little or no training in their formal education concerning the use of computer in teaching. In all faculties, lecturers should be introduced and trained on how to use various ICT tools in the classroom such as projector, computers, electronic whiteboards, digital cameras and solve minor problems common with these facilities.

Importance of ICT in primary schools

Implementation of ICT education in primary school would significantly enhance the achievement of primary schools’ objectives in Ghana, which are to encourage individual learning, improve the quality of teaching and learning, to promote an all-round growth of the whole person by developing the mental, bodily and emotive abilities and attitudes, to pass on literacy and numeracy and cultivate scientific and social skills; promote social equity and prepare the learner for higher education.(Ghana Education Service, 2008)

ICT education in primary schools offers essential skills needed for pupils to learn and live productively in an information age. According to Yelland(2001), traditional educational environments do not seem suitable in preparing learners to be functional or productive in the workplaces in today’s society. She observed that school would not be preparing their students seriously for the live in the twenty-first century if they do not incorporate the use of new technologies in the schools in their system. This is also posited by Grimus (2000), who concurred that by teaching ICT education in primary schools, the pupils are prepared to face future changes with a better understanding in their study, Bransford et al (2000) found out that, what is now know about learning provides an essential guideline for uses of technology that can help students and teachers develop the competencies needed for the twenty-first century. ICT education is therefore viewed as the genesis of all technology,

ICT education in primary schools plays several roles in the learning and teaching processes. Many researchers and theoretist assert that the use of computer can help students to become knowledgeable, reduce the amount of direct instruction given to them, and provide teachers an opportunity to help those students with particular needs (Romeo, 2006). Computer education is profitable to the students since it has potential benefits such as tools include those for enhancing teaching and learning in schools (Skinner and Preece, 2003). These tools include those for data capture, multimedia software for simulation, publishing and presentation tools, digital recording equipment, computer projection, technology and computer-controlled microscopes (Osborne and Hennesy, 2003). The use of ICT in the educational context has opened up many possibilities for curriculum change; often these reflect ICT-related changes. ICT in classroom can be associated with significant in classroom climate and teacher and student roles in learning; for example, group work and collaborative learning activities can be enhanced when implemented.

Summary of literature

The context, scope and contribution of the previous studies do not contextually answer the question of learner’s inability to use the computer mouse. There is the need to examine more on learners of Bosofour R/C primary 6, in improving their mouse skills. As discussed above, improving learner’s mouse skills depends on learner’s knowledge about computer mouse, the teachers’ level of training on ICT, teachers’ pedagogical experience, administrative support and more of activity practical lesson.

III. METHODOLOGY

The purpose of this study is to improve the mouse skills of learners of Bosofour R/C primary 6 using the optical mouse so that they will be able to use the computer effectively. This chapter consist of three major components; subjects, procedure and data analysis. The subject consists of the population and sample size. Procedures in the study comprises of the research design, instrument and data collection. The method employed in the analysis of data forms the third component.

Research Design

The type of research design used in this study is action research, descriptive one to be precise. Action research design is the most commonly used method of data collection. It is used in determining academic difficulty such as the problem at stake. Action research was selected because it will help in documenting all aspect of the academic difficulty in the way they occur; it is also a classroom- based action research and is aimed at solving a problem and to improve practice. According to (Kemmis and Taggart, 1988), action research is a form of collective- self inquiry undertaking by participants in social situation in order to improve the rational and to justify their own practices as well as their understanding of these practices and the situation in which these practices are carried out. (Leawi 1996) affirms that action research brings about democracy.

The strength of this design supports the decision taken by the researcher to employ it for a successful research work. That is focusing on the identified problem, implementing the practices and trying to produce change in the setting within which the researcher identified the problem.
Above all the advantages of the design chosen, it has been subjected to some form of criticism. The use of action research is time consuming. It involves a lot of time in identifying a topic and finding suitable intervention to be used, it needs a critical selection of learners with a peculiar problem and device a good intervention to address the problem. The planning of instruments to be used requires time and proper thinking. Again it become tedious and difficult to collect data and information when learners involved are not co-operating the reason been that learners involved may stop schooling or better still feel reluctant in helping the researcher.

Population

The target population was all primary school learners of Mampong municipality in the Ashanti Region. The accessible population is composed of all learners in Bosofour R/C primary school. The population of the school at the time the study was been conducted was 520 comprising of 248 boys and 272 girls. The researcher used 20 learners (10 boys and 10 girls) for the research work.

Sample and Sampling procedure

The researcher used simple random sampling technique (lottery approach) to select 20 learners (10 boys and 10 girls) out of 60 for the research work. Random sampling is a type of research sampling technique where the researcher selects the sample without favor or bias. In simple terms, a random sampling is basic sampling technique where we select a group of subjects (a sample) for a study from a larger group (a population). Each individual is chosen entirely by chance and each member of the population has an equal chance of being included in the sample. The researcher used this technique because of the following advantages;

1. Each individual in the population has the same probability of being selected.
2. Easy to use accuracy in representing the population.
3. It is the best way of reducing sampling error which is the major goal of any selection technique.

Research Instruments

Three major research instruments were used in gathering the needed data for this research. This includes;

a. Test,  
b. Observation and  
c. Interview.

Test

A test is a formal systematic, usually paper and pencil procedure to gather information about learner’s behavior. It is also said to be an attempt to determine how an individual will function in a set of actual situation. In short, a test is a device that makes one demonstrate ones’ level of ability, mastery or competency in a specific traits or attributes in detail. This research instrument is valid and reliable because it is able to measure ones’ level of competency or mastery in a specific area. The researcher realized that the teacher was the only person who used the computer mostly during practical lessons, the researcher further conducted a test on the learners to find out learners inability to use the computer mouse. The test used for the study was of two types mainly; the pre-test and the post-test and was administered within duration of 20 minutes after which their performances were checked against the time and recorded.

Observation

Observation specifically refers to the systematic collection of information about a student in his/her natural environment. This data gathering can occur anywhere in the learners setting, classroom, playground, home and other such situations. Observation is a valid and reliable instrument in this study because it occurs within the learner’s natural environment and can also take place daily. The researcher under studies the target behaviors’ (using some prepared checklist) and records them. This data collection procedure was used so that the learners can be observed in a natural setting as far as mouse skills are concerned.

Interview

Is a face-to-face conversation between two persons, a questioner and a respondent where the questioner initiates the conversation for the specific purpose of obtaining relevant information from the respondent. It is flexible and adaptable. The researcher chooses this instrument because it results in a much higher response rate and also responses can be probed, followed up, clarified and elaborated to achieve accurate responses. Almost all the learners were asked exactly the same questions and almost the way. It was conducted on learners with the problem and teachers who may have information about the problem. Interview questions can be found in (Appendix A)

Data Collection Procedure

Interventional process is a procedure planned, explored and implemented to solve a specific situation. It involves a step-by-step procedure which is constantly monitored over varying periods of time and by a variety of mechanisms. The intervention process has these three phases;

a) Pre – intervention stage  
b) Intervention stage  
c) Post – intervention stage.

Pre – intervention stage

At this stage of the study, the researcher administered a test and interviewed learners to get more information about the problem. The researcher realized that the teacher was the only person who used the mouse mostly during practical sessions without the learners being involved; the researcher asked both the teacher and learners for more information about the problem. Sample of the interview questions are in (Appendix A). In the course of the study, the researcher
developed a test for learners with total marks of 10 within 20 minutes since time is a determining factor in learner’s ability to use the mouse effectively. The learners were asked to perform some mouse actions for marks.

Below are the questions that were given to learners with their marks assigned to them:

1. Highlight a word from the sentence. ‘Computer mouse is a major part of a computer.’ (2mark)
2. Select a sentence from the paragraph below, ‘If learners are to excel and do well in the field of ICT, they need to know how to use the mouse properly and effectively. Computer technology is applied in different sectors long time ago to enhance effectiveness in various aspects including education sector.’ (2 marks)
3. Copy and paste these words five times. ‘Improve your mouse skills.’ (2 marks)
4. Cut the first sentence and paste it at the end of the paragraph. ‘If learners are to excel and do well in the field of ICT, they need to know how to use the mouse properly and effectively. Computer technology is applied in different sectors long time ago to enhance effectiveness in various aspects including education sector.’ (2 marks)
5. Write two actions the mouse is used to perform. (2 marks)

Below is a learner working on pre-test questions.

**Table 1; Pre-Test Scores of learners;**

<table>
<thead>
<tr>
<th>Marked scored</th>
<th>Number of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>10</td>
<td>50%</td>
</tr>
<tr>
<td>3-4</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>5-6</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>7-8</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td>9-10</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

From the table 1, it is showed that 50% of the learners failed the test therefore the researcher needed to intervene with intervention process to curb the problem.

**Intervention stage**

In order to solve the problem, the researcher used 3 consecutive weeks to teach the various mouse skills to enable learners use the mouse effectively.

**Week 1**

**Handling the mouse**

The researcher taught learners how to handle the computer mouse.

Below show the scores of learners after the pre-test.
Learners must have seen a computer mouse and used it also; they were asked how many buttons are there on the mouse. Generally, we use two buttons thus the left and right, but sometimes we need the mouse to move up and down also. That is button number three, a scroll button. Always roll the mouse on a mouse pad, if this is done you will see a small arrow moving on the screen of the computer, the small moving arrow is called a pointer or mouse pointer. Learners were taught that the index finger was on the left mouse button.

Below shows a learner placing the index finger on the mouse

![Figure 7: Learner placing the index finger on the mouse.](image)

The middle finger rest on the right mouse button and the other (thumb, ring and little) fingers are used in gripping the mouse gently.

Below depict a learner placing the middle finger on the mouse

![Figure 8: learner placing the middle finger on the mouse.](image)

Learners were observed on many occasions and the researcher designed a guideline on a sheet for learners to take home and learn more about the proper way of handling the mouse.

Items found on the guideline are:

1. Rest the heel of your hand on the surface behind the mouse and keep it on the surface when moving.
2. Press gently and quickly on the mouse button when clicking.
3. Do not twist or rotate the mouse and make sure that the ends of the mouse point forward and back on the mouse pad.
4. Grip the mouse gently with your thumb on one side and your ring and little fingers on the other hand.
5. Learners were given series of tasks within 20 minutes’ duration and their work was recorded.

Week 2

Actions the mouse performs

The researcher taught learners various actions (skills) the mouse performs. Skills such as drag and drop, left clicking, right clicking, copy and paste, cut and paste, selecting and double clicking were taught throughout the week.

Below show learners working on the actions the mouse performs after being taught.

**Drag and drop:** press and do not release the left mouse button and finally release the button at the desired place.

**Left clicking:** press the left button once.

**Right clicking:** press and release the right mouse button without moving the mouse.

**Double clicking:** to press and release the left mouse button twice in a rapid succession.

**Copy and paste:**

![Figure 9: Copying an item on the desktop](image)
Learners worked within 20 minutes and their level of accuracy was checked and recorded.

**Week 3**

**Practical lesson**

The last week was for practical lesson, learners were taking through similar Microsoft Word test. They were given 20 minutes to complete the test and a task sheet was provided as a guideline. The number of learners who were able to complete the test within 20 minutes was recorded. The practice included selecting of text, copying and pasting, highlighting a sentence, dragging and dropping of objects using the mouse only in the Microsoft Word.

**Below is a picture of learners working with facilitator during a practical lesson**

![Figure 14: learners working during a practical lesson](image)
Post –intervention stage

After the intervention process was completed a post-test was conducted with the same question used in the pre-test to identify the effectiveness of the intervention process. The test was administered within 10 minutes for which their marks were recorded. Upon conducting the test, the researcher realized that learners have understood the concept very well and their interest in mouse skills has improved. Learners were asked to perform some mouse skills for marks.

Below are the questions that were given to learners with their marks assigned to them.

1. Highlight a word from the sentence. ‘Computer mouse is a major part of a computer.’ (2marks)
2. Select a sentence from the paragraph. ‘If learners are to excel and do well in the field of ICT, they need to know how to use the mouse properly and effectively. Computer technology is applied in different sectors long time ago to enhance effectiveness in various aspects including education sector.’ (2 marks)
3. Copy and paste these words five times. ‘Improve your mouse skills.’ (2 marks)
4. Cut the first sentence and paste it at the end of the paragraph. ‘If learners are to excel and do well in the field of ICT, they need to know how to use the mouse properly and effectively. Computer technology is applied in different sectors long time ago to enhance effectiveness in various aspects including education sector.’ (2 marks)
5. Write two actions the mouse is used to perform. (2 marks)

Below show learners working with facilitator on the post-test questions

![Figure 15: Learners working with facilitator on the post-test questions](image)

<table>
<thead>
<tr>
<th>Marks scored</th>
<th>Number of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>3-4</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>5-6</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>7-8</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>9-10</td>
<td>16</td>
<td>80%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

From the above table two 80% of learners did very well as compared to the pre-test. Learners passed the test with highest score of (9\10).

Data Analysis

The research questions were analyzed with frequency distribution tables. This is however dealt with in details in chapter four. This helped in finding out whether adequate time for practical and the use of self –instructional software tutorial on mouse skills solved the problem.

IV. RESULTS AND DISCUSSION

The justification as to why mouse skills should be taught is simple. The society has become one that is geared towards technology. More than fifty percent of the workforce use computers and other ICT tools in their daily job (Bartholome, 1996). Learners of today need to know how to use the mouse properly and effectively if they are to be successful in this technological era. This chapter deals with the representation of learner’s performance in both the pre-test and post-test questions. The results of learner’s inability to use the mouse effectively are presented in this chapter using frequency distribution table and percentages (%).

Pre-intervention results

Research question 1

What are the causes of Bosofour R\C primary 6 learner’s inability to use the mouse?

Microsoft Word Test on mouse skills prior to the intervention.

<table>
<thead>
<tr>
<th>Marks scored</th>
<th>Number of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>10</td>
<td>50%</td>
</tr>
<tr>
<td>3-4</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>5-6</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>7-8</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td>9-10</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>
The table above shows learners performance in using the mouse in Microsoft word application. No learner scored between 9-10 marks representing 0%, 7 learners representing 35% scored between 7-8 marks, 2 learners scored between 5-6 marks representing 10%, 1 learner scored between 3-4 marks representing 5% and 10 learners representing 50% scored between 1-2 marks. The researcher observed that 15 of the learners representing 75% were unable to hold the mouse properly, while 10 learners representing 50% could not click, hold, select, drag and drop items using the mouse.

**Research question 2**

Will the use of practical activity lesson help improve the mouse skills of Bosofour R/C primary 6 learners?

**Self-Instructional Software Tutorials (Grey Olltwit mouse skills)**

Table 4: Learners per-test questions recorded with time.

<table>
<thead>
<tr>
<th>Time(minutes)</th>
<th>No. of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>6-10</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>11-15</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>16-19</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Above 20 minutes</td>
<td>13</td>
<td>65%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4 above shows learners performance in using the mouse within 20 minutes’ duration. No learner representing 0% was able to finish the given task in less than 5 minutes, 4 learners representing 20% were able to finish between 6-10 minutes, 2 learners representing 10% were able to finish between 11-15 minutes and 1 learner representing 5% was able to finish between 16-19 minutes. In all, a total of 7 learners representing 35% finished within the allotted time 20 minutes while 13 learners representing 65% finished above 20 minutes.

**Research question 3**

How will the use of optical mouse guide learners of Bosofour R/C primary 6 improve their mouse skills?

**Microsoft Word Test**

Table 5: Pre-test on effective use of the mouse

<table>
<thead>
<tr>
<th>Task</th>
<th>No. of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use mouse effectively</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Cannot use the mouse</td>
<td>16</td>
<td>80%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

From Table 5 above, the learners were given optical mouse to perform mouse skills using the self-instructed software tutorial (Grey Olltwit mouse skills) throughout demonstration practical lessons. Four (4) learners representing 20% were able to use the optical mouse effectively and 16 learners representing 80% were unable to use the optical mouse effectively.

**Post-intervention results**

**Research question 1**

What are the causes of Bosofour R/C 6 learner’s inability to use the mouse?

**Microsoft Word Test on mouse skills after the intervention.**

Table 6: Post-test scores of learners represented in frequency distribution table

<table>
<thead>
<tr>
<th>Marks scored</th>
<th>No. of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>none</td>
<td>0%</td>
</tr>
<tr>
<td>3-4</td>
<td>none</td>
<td>0%</td>
</tr>
<tr>
<td>5-6</td>
<td>none</td>
<td>0%</td>
</tr>
<tr>
<td>7-8</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>9-10</td>
<td>15</td>
<td>75%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

The Table 6 above shows learners performance in using the mouse in Microsoft Word Application. As shown in the above table, none of the learners scored between 1-6 representing 0%, 5 learners scored between 7-8 representing 25% and 15 learners scored between 9-10 representing 75%. It was observed that all learners representing 100% were able to hold the mouse properly while 17 learners representing 85% could also click, drag, drop, copy and paste items.

**Research question 2**

Will the use of practical activity lesson help improve the mouse skills of Bosofour R/C primary 6 learners?

Table 7: Learners post-test questions recorded with time

<table>
<thead>
<tr>
<th>Time(minutes)</th>
<th>No. of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>6-10</td>
<td>10</td>
<td>50%</td>
</tr>
<tr>
<td>11-15</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>16-19</td>
<td>none</td>
<td>0%</td>
</tr>
<tr>
<td>Above 20 minutes</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

From the above Table 7, 15% representing 3 learners were able to finish in less than 5 minutes, 50% representing 10 learners were able to finish within 6-10 minutes, 25% representing 5 learners were able to finish within 11-15 minutes, and none of the learners representing 0% worked more than 16-19 minutes. In all 18 learners representing 90%
finished within the allotted time 20 minutes while, 2 learners representing 10% finished above the 20 minutes.

**Research question 3**

How will the use of optical mouse guide learners of Bosofour R/C primary 6 improve their mouse skills?

**Microsoft Word Test**

<table>
<thead>
<tr>
<th>Task</th>
<th>No. of learners</th>
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</thead>
<tbody>
<tr>
<td>Use mouse effectively</td>
<td>18</td>
<td>90%</td>
</tr>
<tr>
<td>Cannot use the mouse</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>effectively</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

In Table 8 above, learners were tested at the end of the intervention on their ability to use the mouse effectively. 18 learners representing 90% were able to use the mouse for all the mouse operations effectively and 2 learner’s representing 10% were unable to use the mouse for it function effectively.

**Discussions**

**Research question 1**

What are the causes of Bosofour R/C primary 6 learners inability to use the mouse?

<table>
<thead>
<tr>
<th>Marks scored</th>
<th>No. of learners</th>
<th>Percentage</th>
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<tbody>
<tr>
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</tr>
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<td>10%</td>
</tr>
<tr>
<td>7-8</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
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</tr>
<tr>
<td>Total</td>
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<td>100%</td>
</tr>
</tbody>
</table>

In Table 8 above, learners were tested at the end of the intervention on their ability to use the mouse effectively. 18 learners representing 90% were able to use the mouse for all the mouse operations effectively and 2 learner’s representing 10% were unable to use the mouse for it function effectively.

**Table 5: Pre-test results**

<table>
<thead>
<tr>
<th>Marks scored</th>
<th>No. of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>none</td>
<td>0%</td>
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<td>15</td>
<td>75%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

From the above Tables 3 and 6, learner’s performance in using the mouse in Microsoft word application increased. 75% learners scored between 9-10 and 25% also scored between 7-8 at the post-intervention stage as compared to 5% scoring between 7-8 and no learner scoring between 9-10 representing 0% in the pre-test questions, an increment of 15% of learners scoring between 9-10 and 20% scoring between 7-8.

This is in line with (Mambo, 1998) who said that “Successful implementation of ICT curriculum depends mainly on the perception of teachers, who eventually determine how they implement such a curriculum in the classroom”. This is to affirm that if teacher’s mindset about teaching ICT in our basic schools are changed, learners will perform massively well. (Sahay and Walshan, 1995; Gibson and Obeng, 1997) adds that “Adaptation and application of technology is delayed due to multiple factors including lack of funding and expertise.” Kersaint et al, (2003) concludes by saying that “Teachers who have a positive perception towards ICT, feel more comfortable with using it and usually exploit it in their teaching”.

**Research question 2**

Will the use of practical activity lesson help improve the mouse skills of Bosofour R/C primary 6 learners?

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>No. of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>6-10</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>11-15</td>
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<td>10%</td>
</tr>
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<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Above 20 minutes</td>
<td>13</td>
<td>65%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

From tables 4 and 7 above, confirms that the intervention helped in solving the problem. 90% were able to finish within 20 minutes representing 18 learners, 10% were able to finish above 20 minutes representing 2 learners in the post-test as compared to the pre-test where 35% were able to finish within 20 minutes representing 7 learners and 65% representing 13 learners could not finish within 20 minutes.

The results clearly indicate that after the intervention, learner’s performance was something to write home about using the self-instructional software tutorial (i.e. Grey Olltwit mouse skills). Mostly self-instructional software tutorial, videos and exercise on mouse skills are in the form of mouse oriented computer games to help learners. Mouse skills in the
form of computer games can provide instant feedback of performance scores to the gamer; (Prensky, 2001) adds that this is crucial for learning. Since the scores are being displayed on the screen, it enables the player under the same user name to access his/her performance with time. Doolittle, (1995) also affirms that “exploratory, interactive games are excellent vehicles to be embedded in curriculum content such as mathematics and science concepts that may be hard to visualize or manipulate with concrete materials”.

Research question 3

How will the use of optical mouse guide learners of Bosofour R/C primary 6 improve their mouse skills?

Table 5; Pre-test results on effective use of the mouse

<table>
<thead>
<tr>
<th></th>
<th>No. of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use mouse effectively</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Cannot use mouse</td>
<td>16</td>
<td>80%</td>
</tr>
<tr>
<td>effectively</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 8; Post –test results on effective use of the mouse

<table>
<thead>
<tr>
<th></th>
<th>No. of learners</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use mouse effectively</td>
<td>18</td>
<td>90%</td>
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<td>Cannot use mouse</td>
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<td>10%</td>
</tr>
<tr>
<td>effectively</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

The above tables 5 and 8 show learners’ performance on how effectively they can use the mouse and this is interpreted as 90% represented by 18 learners were able to use the optical mouse effectively, 10% representing 2 learners were unable to use the optical mouse effectively in the post -test while, in the pre-test 20% representing 4 learners could use the optical mouse very well and 16 learners representing 80% were unable to use the optical mouse well.

The ability of an individual to point hands on object in the real world does not give one the ability to efficiently use the computer mouse pointer on the screen, and this have been proved by Wang and Mackenzie (1999) who stated that “patterns found in pointing with the hand to physical target may or may not follow the trends observed in pointing on a computer screen with input device.” This is also posited by Grimus(2000), who concurred that ‘by teaching ICT education in primary schools, the pupils are prepared to face future changes with a better understanding in their study’. Krysa(1998) stated that ‘ICT training should not be limited to teachers who teach computing but to all teachers on the use if computers’.

Summary

The interpretation of the pre- test and post-test scores gathered can be confirmed with boldness that the intervention applied really improved the performance of Bosofour R/C primary 6 pupils in various mouse skills development.

V. SUMMARY, CONCLUSION AND RECOMENDATION

This chapter critically presents the summary of the study, conclusions and recommendations based on the key findings. Provision is also made for suggestions for further research.

Summary

The purpose of the study was to find out the causes of learners of Bosofour R/C primary 6 inability to use the computer mouse effectively and device solutions for better understanding in order to remedy the problem. The sample size of the study consists of twenty (20) learners. Test, observation and interview were the main instruments used for the study. The main design for the study was action research. Per- test and post- test was administered during the pre and post intervention stages respectively. The brain behind conducting these test was to find out learners’ performance before and after the intervention stage. The causes were attributed to inadequate time for practical activity lessons.

Below are under listed key findings from the study.

a. The abstract method of teaching was the main cause for learners’ inability to use the mouse effectively. This created an impression in learners’ that the subject is difficult and they were reluctant in learning it.

b. Increased performance in using the mouse is as a results of self- instructional software tutorials on mouse skills.

c. Learners recommended that if sufficient time is given during practical demonstrations, they would perform massively great.

d. If there should be adequate teaching learning resources provided at the schools’ computer laboratory and other information at their disposal, learners’ would not have problem with using the mouse and other basic computer knowledge.

e. Teachers are to vary their pedagogies if it becomes necessary to enhance effective teaching and learning.

Conclusions

The findings from this study strongly indicates that learners’ mouse skills can be improved greatly through the use of specially designed mouse skills software that allow for interrelated sensory, perceptual mental and psychomotor skills. From this research, it is evidently clear that learners’ mouse skills can be improved if they are given enough time for practical activity lessons. Mouse skills tutorial in the form of computer games can provide instant feedback of performance scores to the gamer; Prensky (2001) adds that computer game is crucial for learning. When the scores, of the player is being displayed on the screen, it enables the player to compare them to his/her previous scores by the same user or other players. This help the gamer to access his/her performance and with time, he/she will become effective in
using the mouse for several operations. It was also clear from the Microsoft word test administered at the end of the intervention that, learners’ will become efficient in using application software if their mouse skills are improved.

Recommendation

As the results of this study has shown the increased performance in using the mouse is as a result of self – instructional software tutorial on mouse skills, the learners used in addition to the sufficient time given them for practical demonstration.

In view of this the following recommendations have been made;

- Ghana Education Service (GES) should equip all basic school in the country with various educational software’s like mouse skills self – instructional tutorials.
- It is also recommended that much time should be allotted for computing lessons especially with the practical sessions in the Basic schools.
- In-service training should be provided for all teachers to be abreast with the new trends of education and the world at large.
- Government and Non-Governmental bodies can provide Basic schools with computers, teaching resources and other ICT tools to aid in effective teaching and learning.
- Teachers must vary their methods, perception about ICT and train themselves to be experts in the field.

Area for further research

The study considered learners’ inability to use the mouse appropriately. The researcher did not investigate the difficulties of computing (ICT) teachers in using the instruments. It is therefore suggested that further research is conducted on the difficulties faced by ICT teachers in teaching the subject or a particular topic under ICT. It is again suggested that, researcher who may under take this study should stick to the use of self – instructional software at the intervention stage since both teachers and learners will be much involved in the teaching and learning process to achieve a positive result.

Finally, the researcher recommends that, further replication can expand the population by covering the whole school or primary schools within a particular district. The greater the population of coverage, the more valid and reliable the findings of the study.

REFERENCES


