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## Improving Computer Mouse Skills of Student Teachers: A Case of St Joseph's College of Education, Ghana

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### Abstract

*Most student teachers do not have the skill to use the computer mouse. Others even could not differentiate the left mouse button from the right mouse button and their uses. To help address this situation, the researchers made use of qualitative research methodology together with some of the sampling techniques to collect reliable and valid information on the problem. Notwithstanding, questionnaire, interview and observational research methodologies were employed in gathering relevant information from the research population. Relevant literature on the problem were consulted to find out the views of other researchers on the study as well as devising appropriate measures and interventions to rectify the problem. The results and findings of this study revealed the true picture of the problem and its effects on students' use of technological equipment.*

**Keywords:** Computer mouse skills, college of education, student teachers, quality research methodology

### 1. Introduction

The subject Information and Communications Technology (ICT) has been the central point of a lot of studies in the previous years. Within Africa, a rising number of researchers have carried out increasing body of research diagnosing the nature, extent, impact and causes of low rate of ICT in Africa in general and Ghana in particular; despite the enormous possible attempts in promoting socio-economic development in the country. Prior to the introduction of ICT syllabus into the Ghanaian education system in 2007/2008 academic year, students at the basic level were not introduced to ICT education at all and the few who were fortunate did not follow any structured syllabus.

According to the teaching syllabus for Information and Communication Technology for senior high school, students of ICT at SHS should have acquired good reading, writing, numeracy and keyboarding skills with a sense of responsibility and the ability to follow rules and regulations and perform task according to procedures as an additional performance requirement.

However, the pre-test conducted on the DBE 1A students indicated the following: students spend too much time but cannot finish any exercise in word processing (9 words per minute); small amount of time for practical lessons; students score low marks in practical exercise and students' typing speed (keyboarding and mouse skills) is far below standard.

Through interview, it was found out that about 70% of the students did not have any ICT course prior to enrolment at St Joseph's College of Education, Bechem. In a period of two weeks, 20% of the 30 computers and accessories broke down due to misuse of devices by the new students.

Through observation, it was discovered that students do not attend ICT lessons early and 60% of those who attend hunt for keys when typing.

In view of this, the study seeks to re-examine the gap between the capacity to take up ICT course at the College of Education level compared to the standard requirement and to examine the existing coping machinery being adopted by both teachers and students at the first year in the Colleges of Education and undertake interventions that will help students catch up with the existing syllabus in the case study school.

### 2. Review of Related Literature

#### 2.1. Theory of Computer Mouse

According to Wikipedia (undated), a mouse is a device that controls the movement of the cursor or pointer on a display screen. A small object you can roll along a hard, flat surface. Its name is derived from its shape, which looks a bit

like a 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. As it is moved, the pointer on the display screen moves in the same direction. Mice therefore contain at least one button and sometimes as many as three, which have different functions depending on what program is running. Some newer mice also include a scroll wheel for scrolling through long documents.

Douglas Engelbart (1963), and pioneered by Xerox (1970), says the mouse is one of the great breakthroughs in computer ergonomics because it frees the user to a large extent from using the keyboard. In particular, the mouse is important for graphical user interfaces because one can simply point to options and objects and click a mouse button. Such applications are often called point-and-click programs. The mouse is also useful for graphics programs that allow you to draw pictures by using the mouse like a pen, pencil, or paintbrush.

Matthew Adjei (2009), maintains that mouse is the most important input device and it must be able to be used correctly. Almost all mouse devices come with two buttons i.e. left-hand and right-hand buttons. He cited the following as the few basic skills required to use the mouse effectively:

### *2.2. Pointing*

Sliding the mouse on the mouse pad moves the pointer on the screen. The hand should be rested on the mouse, moving it slowly around the mouse pad, seeing what happens to the arrow on the screen and the arrow movement or pointer must be controlled.

### *2.3. Clicking*

Gently pressing either of the two buttons on the mouse is one way to give the computer a command to do something. This is called clicking and there are three types of clicking (i.e. single click, double click and triple click). A single click is where you press the left-hand button once; double click involves pressing the left-hand button twice in quick succession while triple click occurs when the user presses the left-hand button three times in quick succession. This also triggers an action separate from that of a single-click. It is most commonly seen in word processors to select a whole paragraph and web browsers, a whole line of text.

### *2.4. Dragging*

Where the left mouse button is pressed and unreleased and then moved with the said button still held down and finally released. Dragging with the mouse is used in many different contexts. This moves an object around the screen with the mouse and the object is "dropped" at the location where the mouse is released. This action is also called "drag-and-drop". Clicking on an element of the interface to move is sometimes called a "grab". For instance, this can be used to change the position of a window by dragging on its title bar. The left mouse button is usually used to perform drag actions.

### *2.5. Types of Mouse Designs*

#### 2.5.1. Mechanical

Has a rubber or metal ball on its underside that can roll in all directions. Mechanical sensors within the mouse detect the direction the ball is rolling and move the screen pointer accordingly.

#### 2.5.2. Optomechanical

Same as mechanical mouse but, uses optical sensors to detect motion of the ball.

#### 2.5.3. Optical

It uses a laser to detect the mouse's movement. The mouse must be moved along a special mat with a grid so that the optical mechanism has a frame of reference.

Optical mice have no mechanical moving parts and they respond more quickly and precisely than mechanical and optomechanical mice (Wikipedia, 2008).

Wikipedia (undated), has also a school of thought regarding mouse classification which includes the following:

#### 2.5.4. Ball Type

One of the first types of computer mouse was with a roll ball underneath it. Two rollers inside the mouse were controlled by the ball to get left and right, up and down. The one downside was the near-constant cleaning that needed to be done.

#### 2.5.5. Optical

The optical mouse is one of two light-type mice that provides more accuracy with the use of a mouse pad. It shoots a beam of light that detects surface and will move the icon in the direction it is moved. Nonporous surfaces work best with optical mouse.

#### 2.5.6. Laser

The laser mouse shoots a rod of light that can use almost any surface to move the arrow on screen.

### 2.5.7. Gaming

Gaming mice or mouse need to be extremely accurate and responsive. It is hard to find a gaming mouse that uses the ball because the optical and laser mice have become extremely advanced for gamers and its resolution is also very important.

Aside from the mouse types given by Wikipedia, it as well highlights mouse pad and its types which are equally important from the foregoing analysis in the sense that mice cannot be comfortably used without timely intervention of mouse pads even though not all mice involve the use of pads. Accordingly, Wikipedia has published Main Article on mouse pad with the content as below:

“The most popular accessory available, is used with most mice. It provides a smooth surface for the mouse to move across, as many desks are not suitable and hardwood or plastic surfaces wear down mouse feet covers faster. Specialised hard mouse pads are made for gamers. Some optical mice do not require a mouse pad as they are designed to use directly over a wood surface. A mouse pad practically requires balled mice, because the ball requires extra friction of the mouse pad to roll smoothly. Many mouse pads feature designs such as the logo of a company as follows”:

### 2.5.8. Mouse Feet Covers

Mouse feet covers are made out of Teflon and are placed over the mouse feet. This made the mouse glide with less resistance over the mouse surface.

### 2.5.9. Cord Managers

Accessories for managing the cord of a mouse come in different forms, but they all help manage the cord on corded mice, so it does not get in the way. Wireless mice, of course need no such accessory.

### 2.5.10. Gel Wrist Pad

A game wrist pad is a soft pad that goes under the wrist to provide padding. The padding provides for a more natural angle of the wrist, aimed to reduce fatigue and excessive stress.

### 2.5.11. Mouse Speed

According to Wikipedia (2002), mouse is often expressed as DPI (Dots per Inch). The DPI is the number of pixels the mouse cursor will move when the mouse is moved one inch. Mouse accelerations/declarations are software tricks that can be used to make a cursor go faster or slower than its PDI. A less common unit, the Mickey is a measure of distance reported by a mouse. It is not a traditional unit of measurement, because it merely indicates a number of “dots” reported in a particular direction. It is only when combined with the DPI of the mouse does it become an indication of the actual distance moved. In the absence of acceleration, the Mickey corresponds to the number of pixels moved on the computer screen.

## *2.6. Common Mouse Operations*

Performing different operations on the mouse provide the activation of specific actions on the interface, with different meanings. GUIs (Graphical User Interfaces) may define and trigger a separate event for each gesture as follows:

### *2.7. Low Level Gestures*

- Click -pressing and releasing a button.
- (left) Single-click - clicking the main button.
- (left) Double-click- click the button two times in quick succession counts as a different gesture than two separate single clicks.
- (left) Triple-click– click the button three times in quick succession.
- Right-click – click the secondary button.
- Drag- pressing and holding a button, then moving the mouse without releasing,
- Button Chording – (a.k.a Rocker Navigation)
- Combination of right-click then left-click.
- Combination of left-click then right-click or keyboard letter.
- Combination of left or right-click and mouse wheel.

The foregoing literature on keyboard and mouse designs indicates that there are variety of keyboards and mice. The type of keyboard depends on the keys arrangement and kind of keys found on them whilst the type of mouse depends on the buttons’ positions designed therein. According to CU Ergo (undated) ‘the choice of keyboard and mouse designs depend on the needs of the user’. It therefore behoves on the one who is typing to choose the appropriate keyboard and mouse for effectiveness and safety.

## *2.8. Empirical Basis of the Study*

### 2.8.1. Activity Method

In this method of teaching, the students are engaged in activities during the lesson. The initiative on which this method is based is that children learn best by doing and find interest and satisfaction in the activity. For just as the child

learns to walk by walking so does, he in his mental activities learn to read by reading and to count by counting and to type by doing typing. Activity method appeals to many of the child's senses. Activity method is good when teaching skills as reading, drawing, dancing, typing and singing. Sometimes a whole lesson or series of lessons may be taught almost entirely as activity lesson. Practice and practical lessons fall under this. They include Demonstration and Drill and Practice.

Demonstration: It consists of showing the learner how a new skill should be performed. This performance should be done by the teacher while the students observe. The learner views a reality or a life like example of a skill or procedures; it can be executed by the learner or the teacher. They can also be delivered by the media such as video, film and audio cassette player if the skills to practise are verbal. Here the learner observes the behaviour exhibited by the teacher or the instruction media, and then they ask questions for clarification. Then they imitate by practising the behaviour as it was done by the teacher or the media. They receive feedback, make corrections, then practise again.

Demonstration is effective in the teaching of psychomotor skills, affective and some skills (application) under cognitive. In conclusion, the researchers uphold that keyboarding and mouse skills (typing speed, skills) can best be developed when the right technique or method is used to help the learner to develop the right attitude and skills towards keyboarding and mouse skills.

### **3. Methodology**

#### *3.1. Research Design*

This research is quantitative in nature and also based on an Action Research designed to identify and investigate into a classroom problem after which measures and strategies were devised to improve upon the situation. Action research therefore involves trying out an idea in a practice with the view to enhancing or changing something and trying to have a real effect on the situation at stake (Kemmis, 1988).

In achieving the above, thorough consideration of the nature of the study was made and the researchers used cross-sectional mechanisms to provide answers to the research main questions.

#### *3.2. Population and Sampling*

The study was conducted on the six classes of Diploma in Basic Education (DBE) of year One at St Joseph's College of Education, Bechem. In all there were two hundred and seventy-six students in the six DBE One classrooms in the school and all of them were expected to take ICT subject and were supposed to do typing.

#### *3.3. Sampling Technique*

A simple random sampling technique was employed to arrive at a sample size of two hundred and seventy-six students. Here a purposive technique was used to select DBE 1A class. This technique was chosen in order to have direct contact with respondents. Also, to meet the large number of respondents within a relative short time and again to make the whole process very flexible.

#### *3.4. Data Collection Instrument*

The research approach was quantitative in nature which focused on questionnaires and interviews with individuals, stakeholders of the case study school (St Joseph's College of Education, Bechem.) that were used to supplement data from reliable literature.

Also published articles, policy documents on the ICT education and other relevant documents were examined and analyzed. Both primary and secondary sources of information were used for the study. The primary data consisted of mainly the administration of structured questionnaire, direct interviews, observation, class exercises and discussions (group and one-on one). The questionnaires were used to assess the capacity of students with regards to basic requirements for ICT instructions at the Senior High School level, College of Education, etc. The other methods were employed at both pre-testing, implementation and post-testing periods.

#### *3.5. Intervention Design and Implementation*

The introduction of the intervention and its implementation within the research process is a major activity that makes action research unique from the other types of research. Action research in this case is not only a problem finding research, because it goes further to also concern itself with solving the problem identified in a particular context.

#### *3.6. Intervention Design*

The intervention design was informed by the customers from the capacity assessment conducted. After a thorough study of the program using both primary and secondary data gathered on the field (i.e. DBE one students of St Joseph's College of Education, Bechem). we introduced intervention strategies that would bring out the best out of the students under the circumstance they found themselves. The intervention design was grouped into pre-intervention and post-intervention phases.

#### *3.7. Pre-Intervention Design*

Having understood the capacity and the background of the students through the responses from the questionnaires, students' exercise books, personal observations, group discussions and interviews, a series of meetings

were held between the students and the researchers on issues concerning the feedback on their background assessment in typing.

Students were made aware of the capacity requirement, the gaps identified and the significance of the study of their academic success and hence the need for their co-operation in bridging the gaps in a participatory manner. They were briefed about the benefits they would derive from the study if they co-operate fully with the researchers.

Further discussions were held with the school ICT tutors in the school on how students could get access to the computer laboratory to do more typing at their free time. Also, contacts were made with other Information Technology Students who are on internship in other schools in the country. Furthermore, many personalities both in the public and the private sectors have been identified as being successful in life due to the study of ICT. Prominent ICT practitioners were mentioned to serve as a role-model to students. Students were made aware that you could not be good in most ICT courses without being good on the keyboard and mouse.

Also, the students were made to understand that they were not the only students facing the recent challenges. Those who felt isolated, neglected and discouraged were identified, and carefully encouraged to sit up. Students who had special problems like financial and other domestic problems were also discovered and advised accordingly. The above-mentioned measures were implemented to enable the researchers prepare the minds of the students for an effective and efficient implementation of the intervention design.

### *3.8. Intervention Design*

The following participatory methods of teaching were employed to help students improve upon keyboarding and mouse skills (typing speed and skills) thereby improving their performances in the study of ICT:

- Demonstration
- The use of software (Mavis Beacon)

### *3.9. Demonstration Method*

To enable students, participate fully during lessons and receive feedback immediately, the researchers made use of demonstration and practice method of teaching during practical lessons such as typing. Students demonstrated their skills and abilities when they were given the chance to perform. The researchers performed skills for students to observe after which students were given the chance to follow the researchers' steps to do the same.

### *3.10. The Use of Software (Mavis Beacon)*

The use of this particular software (Mavis Beacon) did almost 60% of the work. It helped students to learn typing at their free time with or without the help of the teacher. After the initial introduction to the Mavis Beacon Software students were able to use the software to learn on their own.

### *3.11. Implementation*

#### 3.11.1. Demonstration Method

The researchers regularly demonstrated procedures, methods and ways of solving and answering ICT questions to students. Students were then given the opportunity to practise the concept taught. Students were given the opportunity to demonstrate to their fellow students and this helped the students to learn the typing and developed their skills and their speed.

#### 3.11.2. Data Analysis

The primary data gathered through the desk top study coupled with the various responses and observations from the aforementioned activity -based research methods were analyzed accordingly; the data collected were organized by the use of figures and frequency for purposes of presenting data in both qualitative and quantitative forms as an explanation of issues concerning the capacity of first year students to continue with the Information and Communication Technology (ICT) component of the new syllables under the new education reforms. It involved a process of comparing pieces of data and identifying similarities and differences between them for generating patterns or categories from the data. Comparison allowed the researchers to establish the range of categories grounded in the data and the variation within them. Moreover, the pre-intervention data was compared with post-intervention designed in order to estimate the contribution of the action research.

## **4. Results and Discussion**

This section unveils the discussion and interpretation of the result of the study. These results are based on the data gathered through observations, interviews and questionnaires administered to the respondents in the school. The main technique used in analyzing the result was percentages and presented using pie chart. This technique was adopted because it was simple and very easy to understand.

### *4.1. Pre-Intervention Result*

The pre-intervention activities assisted the researchers to gather the data they would require in their effort to help students to improve their skills and speed.

#### 4.2. Research Questions

- Would demonstration method of teaching help to stimulate mouse skills?

Response	No of Students	Percentage (%)
Yes	20	19
No	88	81
Total	108	100

Table 1: Demonstration Method Stimulating Mouse Skills

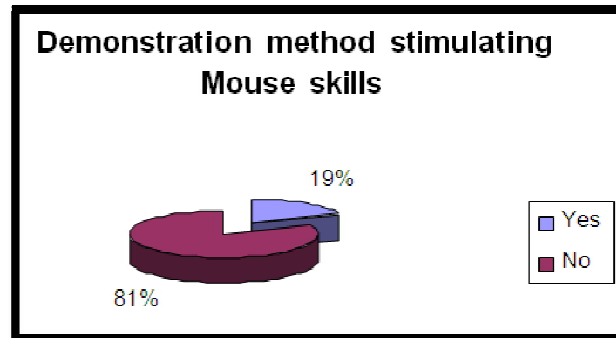


Figure 1: Demonstration Method Stimulating Mouse Skills

From the table 1 and the figure 1, 20 students representing 19% indicated if the researchers demonstrated for them to observe, it would go long away to help them while majority of them representing 81% of the students did not believe how that could happen.

- Would a mouse software and demonstration help stimulate students 'use of the mouse'?

Response	No of Students	Percentage (%)
Yes	30	28
No	78	72
Total	108	100

Table 2: Students' Response on Software and Demonstration Stimulating the Use of Mouse

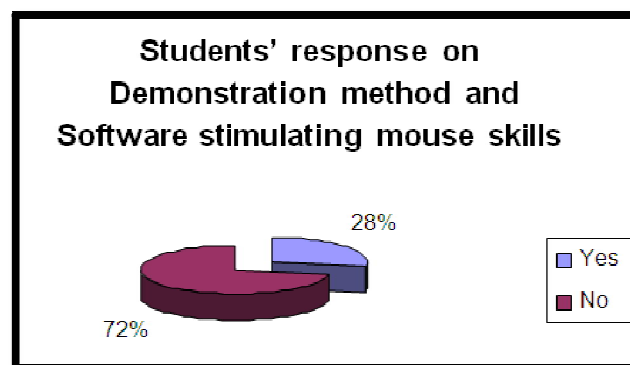


Figure 2: Students' Response on Software and Demonstration Stimulating Typing

From the table 2 and figure 2, 30 students representing 28% indicated when software and demonstrations were put together, they would help them develop their skills well but 78 students representing 72% of the total students indicated that they did not know how that could happen.

#### 4.3. Capacity Assessment

In order to understand the gravity of the problem under study, a capacity assessment was affected on the sampled students. This was done in the light of the standards required by the Information and Communication Technology syllabus for College of Education.

The assessment was administered on the students' ability to demonstrate basic requirement of the syllabus of the Information and Communication Technology.

These basic skills include:

- Mouse skills

#### 4.4. Practical Assessment

The sampled population was divided into 10 groups and subjected to practical assessment to lend credence to the feedback from the response to the questionnaires.

To our uttermost amazement, the distinction between the two results was very small thereby reinforcing the earlier results. The above results informed both pre-intervention designs.

#### 4.5. Post Intervention Result

Below is the analysis of the results of the post-test questionnaires administered on the sampled students.

- Would demonstration method be of help to stimulate mouse skills?

Response	No of Students	Percentage (%)
Yes	89	82
No	19	18
Total	108	100

Table 3: Demonstration Method Stimulating Mouse Skills

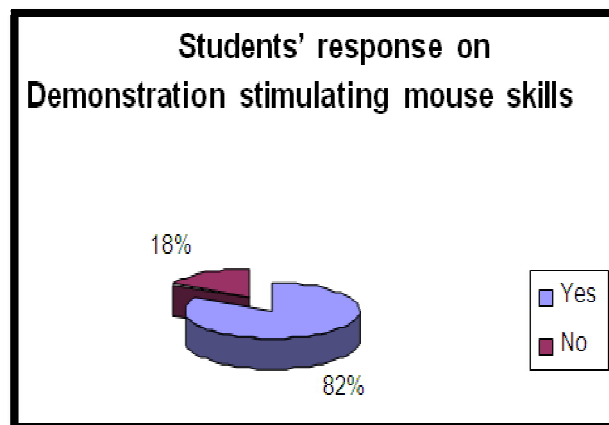


Figure 3: Demonstration Method Stimulating Mouse Skills

From table 3 and figure 3, 82% said demonstration by the researchers motivated them, developed their skills while 18% indicated that even though the researchers did everything to help them it was not enough to enrich their skills.

- Have typing software and demonstration helped stimulate your use of the mouse?

Response	No of Students	Percentage (%)
Yes	98	91
No	10	9
Total	108	100

Table 4: Students' Response on Software and Demonstration Stimulating the Use of Mouse

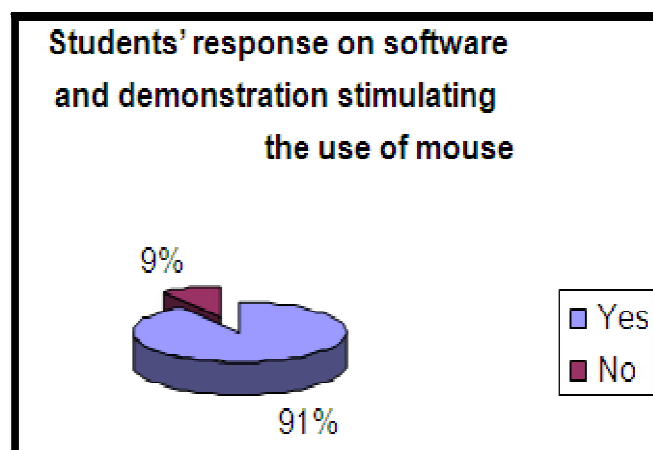


Figure 4: Students' Response on Software and Demonstration Stimulating the Use of Mouse

From table 4 and figure 4, 91% of the students admitted when software for typing and demonstration method was combined, it enhanced their skills appreciably but 9% indicated they did not improve in any way

## 5. Discussion of Post-Intervention Result

When you compare the results from the pre-intervention and the post-intervention, it shows that the attitude and performance changed significantly due to adherence to the intervention put in place by the researchers. The number of students who indicated earlier that mouse skills were not so essential to the course of ICT came to appreciate that mouse skills were paramount in learning most ICT courses, the number escalated from 12 students to 96 students. The number of students who were not convinced that typing software could help them enrich their mouse skills rose from 18 students to 90 students.

Students were encouraged to do more to get to the objectives set since the researchers demonstrated every skill, they wanted the students to acquire.

## 6. Conclusion

It is a fact that recent DBE one student are battling with completing their syllabus given the fact that majority of them are studying the subject for the first time. And the students of St Joseph's College of Education are not exceptional. This is attributed to the fact that; this is the first time ever ICT is being introduced at the basic education and second cycle levels and that students are not sufficiently prepared for the College of Education syllabus for ICT. Also, the computerised selection and placement system, lack of teaching and learning materials and inadequate ITC facilities have exerted much pressure on teachers to adopt various strategies as a coping machinery to arrest the situation. Though teachers do contrast their teaching methods, participatory methods of teaching like, demonstration and typing software are not normally used for various reasons, so students do not always take any active part in the teaching and learning process. Students are also not aware of their role in improving their performance in the midst of the challenges they encounter.

Students are more likely to accept what they learn when it is logically presented in an orderly, precise, and clear and concise manner. We therefore uphold that students should be equipped with skills that will allow them to do much practice themselves to improve upon their mouse skills. Besides, it is glaring to note that students' performance in typing has greatly improved with the use of activity method of teaching, and will continue to change for the better if solutions are found to their problems in a more participatory manner.

## 7. Recommendation

Having realised that finding sustainable solution to challenges is a process, one must not lose sight of the fact that interventions used in this action research are not exclusive in solving the problem at stake; the following are recommended and outlined for the future.

- All stakeholders (teachers and students) in this research and other similar studies should be made aware that problem solving is a process and not an event and this should be the back bone of all efforts intended to bridging capacity gaps in our educational institutions.
- Teachers should in future encourage students to be serious with their practical lessons and exercises and group assignments and submit them promptly for marking. Teachers should engage students with more practical lessons that will provide the podium for students to do more practice since they say practice is the power law of learning.
- Students must be encouraged to visit the computer laboratory at their free period to use the typing software.
- We wish to recommend that variety of teaching methods must be made use of in teaching and learning of typing, more participatory methods like group work and demonstration must be used interchangeably in the delivery of lessons instead of the traditional, passive and other methods of teaching which are found to be ineffective. Conscious efforts should be made to motivate students in the study of typing to help them to develop their skills.
- By and large, teachers must give more assignments to engage students all the time so that the skills acquired will be put into good use thereby polishing it up.

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