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Influence of Multimedia on Students' Interests and Achievement in teaching the Concept of Lines of Symmetry in Geometry

Influence Du Multimédia Sur Les Intérêts Et Les Réalisations Des Élèves Dans L'enseignement Du Concept De Lignes De Symétrie En Géométrie

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Abstract

The technological development in the world today has also been applied in the field of education so as to make the process of teaching and learning easy and understandable to students. One of this technological development is the multimedia which is intended to be used in this study to boost the achievement of students in line of symmetry. The objectives of study were to find the difference between the mean achievement and interest scores of students taught line of symmetry using multimedia and those taught using paper folding and the gender difference in achievement. The research design used for the study was the pretest posttest groups design. The population comprised Junior Secondary Two (JSII) students in Yenagoa Local Government Area of Bayelsa State. The size of the population was 2216 JSII mathematics students for the 2017/2018 academic session. The sample constituted 92 JSII students in their intact classes from two schools selected using simple random sampling technique. The instruments used for the study were mathematics achievement test and interest questionnaire. A test- retest method was used to determine the

reliability of the instruments, while their validity was ascertained by experts. Data collected were analysed using mean, standard deviation and analysis of covariance at 0.05 level of significance. The results indicated that students taught using multimedia performed significantly better than those taught using paper folding. The interest of those taught using multimedia was significantly better than those taught using paper folding. Findings of the study also indicated that gender had no influence on students' achievement when taught using multimedia. It was concluded that multimedia significantly enhanced students' achievement and interest.

Résumé

Le développement technologique dans le monde d'aujourd'hui a également été appliqué dans le domaine de l'éducation afin de rendre le processus d'enseignement - apprentissage facile et compréhensible pour les élèves. L'un de ces progrès technologiques est le multimédia qui a été utilisé dans cette étude pour améliorer les résultats des apprenants en ligne de symétrie. Les objectifs de l'étude étaient de trouver la différence entre les scores moyens de réussite et d'intérêt des élèves apprenant l'alignement symétrique à l'aide du multimédia et ceux enseignés avec le pliage du papier et la différence de réussite entre les sexes. La méthode de recherche utilisée pour l'étude a été celle des groupes de post-test pré-test. La population était composée d'élèves du premier cycle du secondaire (JSII) de la zone d'administration locale de Yenagoa, dans l'État de Bayelsa. La population était de 2216 apprenants en mathématiques de JSII pour l'année académique 2017/2018. L'échantillon comprenait 92 élèves de JSII dans l'ensemble des classes de deux écoles sélectionnées à l'aide d'une technique d'échantillonnage aléatoire simple. Les instruments utilisés pour cette étude étaient le test de rendement en mathématiques et le questionnaire d'intérêt. Une méthode test-test a été utilisée pour déterminer la fiabilité des instruments, tandis que leur validité était vérifiée par des experts. Les données recueillies ont été analysées en utilisant la moyenne, l'écart type et l'analyse de la covariance à un niveau de signification de 0,05. Les résultats ont montré que les élèves apprenant à utiliser le multimédia réussissaient nettement mieux que ceux apprenant à plier le papier. L'intérêt des apprenants utilisant le multimédia était significativement meilleur que ceux apprenant à

l'aide du pliage de papier. Les résultats de l'étude ont également indiqué que le sexe n'influençait pas les résultats des étudiants apprenant à utiliser le multimédia. Il a été conclu que le multimédia améliorait considérablement les résultats et l'intérêt des élèves.

Keywords: *Multimedia, Gender, Interest, Achievement, Geometry.*

Mots-clés: *multimédia, genre, intérêt, réalisation, géométrie.*

Introduction

Symmetry is a concept in mathematics under geometry and is found everywhere in nature. It is the axis or imaginary line that passes through the center of a shape or object and divides it into identical halves. As a small part of geometry, symmetry is an integral component connecting mathematics to the real world (Knuchel, 2004). It is one of the most powerful and pervasive concepts in mathematics (Gorini, 1996). It has been a guiding light for physicist since the turn of the 20th century.

Mathematics students have limited ideas of symmetry but are fascinated by concrete examples of symmetry in nature and in art. The study of symmetry can be as elementary or as advanced as one wishes; for example, one can simply locate the symmetries of designs and patterns, or use symmetry groups as a comprehensible way to introduce students to the abstract approach of modern mathematics. Furthermore, the ideas used by mathematicians in studying symmetry are not only unique to mathematics and can be found in other areas of human thought. By looking at symmetry in a broader context, students can see the interconnectedness of mathematics with other branches of knowledge. For these reasons, many mathematicians today feel that the mathematical study of symmetry is worthwhile for general education of students (Gorini, 1996).

There are a number of self-benefits to students in the study of symmetry (Knuchel, 2004). This includes children been able to have an innate sense of symmetry, in that they look for balance and order in the real world. Another point is that learning about symmetry aids students in

learning how to classify objects according to the arrangement of their constituent parts (Knuchel, 2004). Ordering and classification of skills are used throughout many daily tasks, and the ability to notice patterns and/or similarities will make these tasks easier to carry out. Thirdly, the study of symmetry in schools looks beyond geometric forms to organic shape: animals and plants. Children have the tendency of playing with objects in their environment and learning about symmetry encourages this interest as it would make them find more of symmetrical objectives. Lastly, children learn concepts about geometry at a very early age. They learn first, about a shape as a whole, but, with the help of symmetry, children learn how to focus on the characteristics and parts of an object.

Studies carried out in the United Kingdom, the United States of America (USA), and Australia have found that seventh grade children have difficulty with symmetry (Kouba, Brown, Carpenter, Lindquist, Silver, & Swafford, 1988; Owens, 1997). Two questions on symmetry involving mirror reflections were poorly answered by Year 6 students in New South Wales (NSW) on Basic Skills Tests (Australian Council for Educational Research, 1989-1991). The reason for this may be due to the fact that beyond the superficial "bilateral symmetry", the main context of the concept is more abstract in nature and might not be easily understood by students, and is capable of causing loss of interest altogether (Valenzeno, Alibali & Klatzsky, 2003). In Nigeria today, the concept of symmetry is seldomly discussed among students because of a lot of teachers not being able to state the importance of it in real-life situation and tend to avoid teaching it because they consider the concept being too elementary. This could result to students not being interested in the concept and apply it where it is required.

Interest, according to Torty and Offorma (2013), is an emotionally oriented behavioural trait which determines a student's urge and vigour to tackle educational programmes or other activities in learning. Kpolovie (2010) asserted that interest could be a very powerful affective psychological trait and could energize cognitively processed information much faster and accurate in addition to effective application of psychomotor traits like self-regulatory skills, self-discipline, working harder and smarter with optimum persistence.

Students need to be stimulated in order to have them interested in whatever is to be taught because interest is a sign of attention, once there is direct interest, attention is guaranteed and learning could be assured. Therefore, interest becomes vital in educating the students on the concept of symmetry.

Education is the process which brings about the development of the individual according to his needs and demands of society. Aside inculcating intelligence and the right kind of character in the educated, the main function of true education also includes the passing of valuable thoughts, ideas and skills; from generation to generation, necessary for the sustenance and improvement of a given civilization. Amidst the issues bedevilling modern education is the problem of effective teaching (Adenegan & Osho, 2011).

Ikitde and Akpan (2014) defined teaching as a process of social interaction between a teacher and learner(s) with the purpose of transmitting worthwhile knowledge from the teacher to the learner and of acquiring new skills and attitudes. Teaching is said to be ineffective when present instructional objectives are not realized. Factors affecting the effective teaching and learning of Mathematics have been highlighted to include unavailability and improper use of teaching resources (Oyola, 2010). Ojo and Nkoyane (2016) highlighted teacher to student ratio, as well as unavailability and efficient use of teaching resources as factors influencing effective teaching in secondary schools in Nigeria.

Resources could aid understanding of students because it evolves the use of the cognitive, affective and psychomotor domains. The implication here is that resources that best enhance the communication of particular lessons' ideas should be brought into the classroom during the course of teaching such ideas (Abimbade, 2010). In such situations, the students do not only listen to their teacher and memorize desired materials to the detriment of their intellectual growth and academic achievement; but are drawn into active participation by stimulating their senses using these resources, which makes learning meaningful and relatively permanent (Ghavami, 2016). In contemporary times, the issue of active involvement of learners as being paramount in any

educational process can be looked at from the angle of educational technology.

The use of multimedia in teaching and learning is an attempt at a better application of educational technology in the classroom. Gabreyohannes and Hasan (2016) defined multimedia as any computer-mediated software or interactive application that integrates text, colour, graphical images, animation, audio and full motion video. According to Olori and Igbosanu (2016), multimedia is the ability of a system to communicate information simultaneously through multiple media: text, still images, graphics, photos, animated images, movies and sound. The researchers intend to use the computer system which functions as a multimedia having the ability to communicate information simultaneously through graphics, photos, animated images and sound, while presenting the concept of symmetry. According to Mayer (1947)'s cognitive theory of multimedia, learners attempt to build meaningful connections between words and graphics and that they learn more deeply than they could have with words or pictures alone

The cognitive theory of multimedia learning (CTML) was based on three main assumptions that is there are two separate channels (auditory and visual) for processing information; there is limited channel capacity; and that learning is an active process of filtering, selecting, organizing, and integrating information. According to the theory, one of the principle aims of multimedia instruction is to encourage the learner to build a coherent mental representation from the presented material. The learner's job is to make sense of the presented material as an active participant, ultimately constructing new knowledge.

Multimedia technologies are probably one of the most exciting innovations of the information age. Its rapid growth has brought fundamental changes to the educational system, creating suitable learning contexts which can enable the learner to manipulate the learning environment (Milovanović, Takači & Milajić, 2012). Multimedia learning systems consist of animations and narration, which present a wealthy avenue for improving students' understanding

(Mayer & Moreno, 2000). Having a positive impact on learning outcomes, multimedia are capable of stimulating multiple senses of students at the same time (Gabreyohannes & Hasan, 2016). It can also provide the teacher with the opportunity of being able to control the flow of information, hence, control in the timing of presentation of concepts and ideas, which facilitates learning across gender (Noroozi, Ahmad & Aghabarati,, 2012).

Gender is an attribute that has to do with social, psychological, and cultural attributes of male and females. According to Nnamani and Oyibe (2016), Gender is a social connotation that has sound psychological background, and it is used to refer to specific cultural patterns of behaviour that are attributed to male or female. Gender is one of the main issues especially among academics all over the world, of which Nigeria is inclusive. Academic achievement with respect to male and female has generated a considerable interest in the field of education. Ilhan and Oruc (2016) investigated on the effect of the use of multimedia on students' performance in Turkey. The study concluded that multimedia increased the interest and academic success of students when compared to traditional classroom. They further asserted that while females' interest seemed to significantly risen, gender was no significant factor in the experimental group.

Kaur, Sharma, and Singh (2015) conducted a study titled, "Effectiveness of Multimedia Approach on the Academic Achievement of Class 8th students in English". Result showed that the multimedia package prepared by researcher for teaching English was found to be more effective for academic achievement of class 8th students in English. Arıcı and Yekta (2005) in a similar study concluded that there was no significant difference between the pre-test and post-test of experimental and control groups. They found that multimedia has neutral effect on the academic achievement of students. It however stated that the interest in the classroom was greatly aroused, and that there was no significant difference in the achievement of male and female students. The study in this regard intends to determine the difference between the interests and mean achievement scores of students taught lines of symmetry using multimedia and those taught

using paper folding. The study is also intend to examine gender differences in terms of achievement of students.

Statement of the Problem

The continuous poor performance of students in geometry and mensuration in mathematics is worrisome to mathematics educators in Nigeria, and in other countries as well. Plane and solid shapes, polygons, and geometrical transformations are topics generally identified by learners and teachers to be difficult to learn and teach in schools (Abiam, Abonyi, Ugama & Okafor, 2016). They further stated that the child lives and moves in space with important geometrical qualities such as the basic properties of metrics (symmetry of metrics).

The state of teaching and learning of symmetry which develops the ability of students to judge the positions, sizes, lining and shapes of objects in space and that also leads to the understanding of geometrical concepts has not improved. This state has resulted to this study which intends to find out if multimedia can be used to enhance the interest and achievement of students in the teaching of symmetry.

Purpose of the Study

The purpose of this study is to ascertain the effects of multimedia on students' interests and achievement in the teaching of lines of symmetry. The study

1. Examined the difference between the mean achievement scores of students taught line of symmetry using multimedia and those taught using paper folding.
2. Find the difference between the mean interest scores of students taught line of symmetry using multimedia and those taught using paper folding.
3. Determined the difference between the mean achievement scores of male and female students taught line of symmetry using multimedia.

Research Questions

The following research questions were answered.

1. What is the difference between the mean achievement scores of students taught line of symmetry using multimedia and those taught using paper folding?
2. What is the difference between the mean interest scores of students taught lines of symmetry using multimedia and those taught using paper folding?
3. What is the difference between the mean achievement scores of male and female students taught lines of symmetry using multimedia?

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. There is no significant difference between the mean interest of students taught lines of symmetry using multimedia and those taught using paper folding.
2. There is no significant difference the mean achievements scores of students taught lines of symmetry using multimedia and those taught using paper folding.
3. There is no significant difference between the mean achievement scores of male and female students taught lines of symmetry using multimedia.

Research Methods

The design for the study was a quasi-experimental design using a pretest and posttest control group design. The researchers used the students in their intact classes. This was to avoid the disruption of the school use where some students would have been denied the opportunity of attending classes when others were undergoing the experiment. The experimental group was taught using multimedia while the control group was taught using paper folding.

The population of the study consisted of all Junior Secondary Two (JS1I) students in all the co-educational secondary schools in Yenagoa Local Government Area of Bayelsa State. The size of the population was 2216 JSII mathematics students for the 2017/2018 academic session. The sample consisted of 92 JSII mathematics students from two schools. The

two (2) secondary schools were purposively selected from the schools in the population. The purposive sampling technique was used because the researchers were interested in a school that had a fully equipped computer laboratory.

Two researcher-designed instruments were used for the study. These were Mathematics Interest Questionnaire (MIQ) and Mathematics Achievement Test (MAT). MIQ was used to determine the interest of the students while MAT was used to determine the achievement of students. MIQ had two sections, Sections A and B. Section A was on demographic information of students while section B had thirty items on students' mathematics interest with the options of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). MAT also had two sections, Sections A and B. Section A was on demographic information of students while section B had twenty multiple choice items on symmetry. Each item had four (4) options A, B, C and D with only one correct answer.

The instruments were face and content validated by one experienced secondary school teacher, one expert in test, measurement and evaluation and one expert in mathematics education. These evaluators were requested to vet the items for clarity of words, plausibility of the appropriateness to the level of the students and adequacy in addressing the objectives and the problems of the study. Their comments and corrections were incorporated into the final form of the instruments. In order to test the reliability of the instruments, the instruments were administered on a sample of 30 students in a school not selected to participate in the study but whose students had similar qualities as those in the study. The test retest method was used to determine the reliability of the two instruments. The instruments were administered to the same students twice within an interval of two weeks. The scores obtained from the two administrations were correlated using Pearson Product Moment Correlation. The reliability coefficients (r) of the two instruments were found to be 0.74 and 0.79 for MIQ and MAT respectively, indicating that the instruments were reliable.

The teachers teaching mathematics in the selected schools were used as research assistants. They were trained for three days each and were provided with detailed instructions and lesson packages on line of symmetry in Geometry. The two groups of students were administered

the MIQ as pre-interest and MAT as pretest before treatment started. The experimental group was taught using multimedia. The students were each provided with computer system and a Compact Disk (CD) in which the software for teaching symmetry was impressed. The students were taught on how to open the CD, assess the different objects and find their lines of symmetry. This was first demonstrated to the students by their teacher using a projector. The real-life applications of the concepts were shown to the students through the computer using graphics, animations and simulations.

The control group was taught using paper folding. The different objects were presented in paper form where the students were asked to find the lines of symmetry after the teacher demonstrated with a few examples. The application of the concept to real life was explained by the teacher and discussed in the class. The two groups were taught the selected concepts for four double class periods of forty minutes a period. MIQ and MAT were administered to the two groups as post-interest and post-test respectively after the items were being reshuffled. The questionnaires and test scripts were scored. The questionnaires were 4-points for SA, 3-points for A, 2-points for D and 1-point for SD while one mark was awarded for each correct option and zero mark for a wrong option.

The data collected were analysed using adjusted mean, standard deviation and Analysis of Covariance (ANCOVA). All the hypotheses were tested at 0.05 level of significance.

Results

The data collected for the study were presented based on the research questions and hypotheses of the study.

Research Question One

What is the difference between the mean achievement scores of students taught line of symmetry using multimedia and those taught using paper folding?

Table 1: Adjusted Mean Score and Standard Deviation of Experimental and Control Group.

Group	N	$\dot{X}$	SD
Experimental	43	17.46	0.98
Control	49	16.27	1.24

As shown in Table 1, the adjusted mean score of the experimental group taught line of symmetry using multimedia was 17.46 while that of the control group taught using paper folding was 16.27. This indicates that the experimental group achieved better than the control group. Table 1 also showed that the standard deviation of the experimental group was 0.98 while that of the control group was 1.24. The standard deviation of the experiment group was lower than that of the control group indicating that majority of the students in the experimental group taught line of symmetry using multimedia benefited from the teaching when compared to the control group taught line of symmetry using paper folding.

Research Question Two

What is the difference between the mean interest scores of students taught line of symmetry using multimedia and those taught using paper folding?

Table 2: Adjusted Mean Interest Scores and Standard Deviation of Experimental and Control Group.

Group	N	$\dot{X}$	SD
Experimental	43	3.12	0.27
Control	49	2.81	0.30

As shown in Table 2, the adjusted mean interest of the experimental group taught line of symmetry using multimedia was 3.12 while that of the control group taught using paper folding was 2.81. This indicates that the experimental group developed more interest than the control group. Table 2 also showed that the standard deviation of the experimental group was 0.27 while that of the control group was 0.30. The standard deviation of the experiment group was lower than that of the control group indicating that majority of the students in the experimental group taught line of symmetry using multimedia

benefited from the teaching when compared with the control group taught line of symmetry using paper folding

Research Question Three
What difference exists between the mean achievement scores of male and female students taught line of symmetry using multimedia?

Table 3: Adjusted Mean Score and Standard Deviation of Male and Female Students Taught Using Multimedia.

Gender	N	$\dot{X}$	SD
Male	43	16.88	1.15
Female	49	16.79	1.35

As shown in Table 3, the adjusted mean score of the male students taught line of symmetry using multimedia was 16.88 while their female counterparts was 16.79. This indicates that the male students achieved better than their female counterparts. Table 1 also showed that the standard deviation of the male students iwas 1.15 while their female counterparts was 1.35. The standard deviation of male students was lower than that of their female counterparts, indicating that majority of the male students taught line of symmetry using multimedia benefited from the teaching when compared to their female counterparts.

Hypothesis One
There is no significant difference between the mean achievement scores of students taught line of symmetry using multimedia and those taught using paper folding.

Table 4: Analysis of Covariance of Experimental and Control Group of Students Posttest Scores Using Pretest as Covariate.

Source of Variation	SS	Df	MS	F_{cal}	P-$value_{cal}$
Covariate (Pretest)	58.25	1	58.25	92.43*	.00
Main effects (Group)	32.88	1	32.88	52.18*	.00
Residual	56.09	89	0.63		
Total	147.22	91	1.62		

* = Significant at .05 level of significance

As shown in Table 4, the analysis of pretest scores of the two groups of students were significant since the calculated P-value (.00) was less than the alpha level (.05), indicating the mean achievement scores of the two groups were statistically not equivalent. The equivalence of the two groups was however addressed by analysis of covariance that regressed the pretest and posttest scores of the students. The table also showed that the calculated P-value (.00) of the main effects of the groups was less than the alpha level (.05). Therefore, the null hypothesis was rejected. This implied that there was significant difference between the mean achievement scores of students taught line of symmetry using multimedia and those taught line of symmetry using paper folding.

Hypothesis Two

There is no significant difference between the mean interest score of students taught line of symmetry using multimedia and those taught using paper folding.

Table 5: Analysis of Covariance of Experimental and Control Group Students Post-Interest Using Pre-Interest Scores as Covariate.

Source of Variation	SS	Df	MS	F_{cal}	P-$value_{cal}$
Covariate (Pre-interest)	26.72	1	26.72	3.80^{NS}	.05
Main effects (Group)	85.31	1	85.31	12.13^{*}	.00
Residual	625.89	89	7.03		
Total	737.91	91	8.11		

* = Significant at .05 level of significance; NS = Not significant at .05 level of significance

As shown in Table 5, the analysis of pre-interest scores of the two groups of students were not significant since the calculated P-value (.05) was equal to the alpha level (.05), indicating that the mean interest of the two the groups were statistically equivalence. The table also showed that the calculated P-value (.00) of main effects of the groups was less than the alpha level (.05). Therefore, the null hypothesis was

rejected. This implied that there was significant difference between the mean interest score of students taught line of symmetry using multimedia and those taught using paper folding.

Hypothesis Three

There is no significant difference between the mean achievement scores of male and female students taught line of symmetry using multimedia.

Table 6: Analysis of Covariance of Male and Female Students Posttest Scores Taught Using Multimedia with Pretest as Covariate.

Source of Variation	SS	df	MS	F_{cal}	P-$value_{cal}$
Covariate (Pretest)	58.25	1	58.25	58.38^{*}	.00
Main effects (Gender)	0.17	1	0.17	0.17^{NS}	.68
Residual	88.80	89	1.00		
Total	147.22	91	1.62		

* = Significant at .05 level of significance; NS = Not Significant at .05 level of significance

As shown in Table 6, the analysis of the pretest scores of male and female students was significant since the calculated P-value (.00) was less than the alpha level (.05), indicating the mean scores of male and female students were not statistically equivalent. The equivalence of the groups was however addressed by analysis of covariance that regressed the pretest and posttest scores of the students. The table also showed that the calculated P-value (.68) of the main effects of gender was greater than the alpha level (.05). Therefore, the null hypothesis was not rejected. This implied that there was no significant difference between the mean achievement scores of male and female students taught line of symmetry using multimedia.

Discussion of Findings

The findings on the difference between the mean achievement scores of students taught line of symmetry using multimedia and those taught using paper folding indicated a significant difference. Those taught using multimedia achieved better than those taught using paper folding. This may have been as a result of multimedia providing the opportunity of an imitation of real or in some cases imaginary system or phenomena which allows the students to interact with looking for the line of symmetry. Multimedia allowed students to manipulate screen objects for exploring the underlying concept (line of symmetry). It could also be attributed to the students seeing the objects parted into two equal sides in different ways on the computer screen as if it were real. The display of the half of structures and object using the computer system and later merging them may have given them a better understanding. The findings of the study is in agreement with that of Kaur, Sharma, and Singh (2015), who conducted a study on the effectiveness of multimedia approach on academic achievement of Class 8th students in English and found that the multimedia package prepared by researcher for teaching English was found to be more effective for academic achievement of class 8th students in English. The findings of the study is also in agreement with that of Cyril (2016), who found that there was a significance difference between the mean performances of students taught using multimedia and those taught using Demonstration instruction.

The findings on the significant difference between the mean interest score of students taught line of symmetry using multimedia and those taught using paper folding indicated a significant difference. Those taught using multimedia developed more interest than those taught using paper folding. This might have been due to the possibility of presenting different drawings and pictures using the multimedia which supports the clarification of ideas and communication of information. The development of interest may also have been through the easy movement of presented subject to another providing a good chance for questions and discussions. The findings of the study is in agreement with that of Ilhan and Oruc (2016) which investigated on the effect of the use of multimedia on students' performance in Turkey. The study concluded that multimedia increased the interest and academic success of students when compared to traditional classroom. The findings of the study is also in line with that of

Ogochukwu (2010), who found that multimedia presentation significantly boosts students' interest, involvement, enjoyment and liking for mathematics.

The findings on the difference between the mean achievement scores of male and female students taught line of symmetry using multimedia indicated a non-significant difference. This may have been as a result of the computer-assisted instruction producing the same learning effect for both male and female. The findings of the study is in line with that of Abidoye (2015), who found that gender had no significant effect on the academic achievement of students. The findings of the study is also in agreement with that of Thomas and Israel (2014), who found that male and female students were marginal, since the use of multimedia teaching had no effect on the gender.

Conclusion

Based on the findings, it could be concluded that the use of Multimedia is an appropriate teaching strategy capable of improving the achievement of students in teaching the concept of line of symmetry in mathematics. The use of multimedia instruction brings the object of learning to the real situation in a virtual world. Students having the feeling of being in real life may have been stimulated and motivated thereby enhancing their interest in the learning of line of symmetry. The motivation may have created an opportunity for both male and female to excel. Hence, the non-significant difference between the achievement of male and female students.

Recommendations

The following recommendations are made based on the findings:

1. Students should learn the skills of operating the computer so that they will be able to use a disc on which a concept in mathematics is impressed to be taught using the multimedia.
2. Teachers should use the multimedia to teach concepts that need the presentation of real-life situations such as symmetry and others.
3. Seminars and conferences should be held to train teachers on the use of multimedia by school managements, organisations and government.

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