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EXTENT OF TEACHERS' USE OF COMPUTER ANIMATION TECHNOLOGY FOR ENHANCING THINKING SKILLS OF PUPILS WITH SPECIAL NEEDS IN DELTA STATE

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ABSTRACT

This study determined teachers' use of computer animation technology in enhancing the thinking skills of pupils with special needs in Delta State. Descriptive survey was employed in the study. The population of study was 118 primary school teachers in the existing 28 public primary schools in Oshimili North and South Local Government Areas of Delta State. The entire population was studied without sampling because the population was manageable. The instrument for data collection was a nine-item structured questionnaire constructed by the researcher titled "Computer Animation Technology for Enhancing Thinking Skills of Pupils with Special Needs Questionnaire (CAT-ETSPSNQ)". Face validation of the instrument was conducted by three experts. The reliability of the instrument yielded reliability coefficient value of 0.78. Descriptive statistics of mean and standard deviation were used to analyze the research question while inferential statistics of t-test was employed for testing the null hypotheses at 0.05 level of significance. The study found among others, that teachers, to a great extent used computer animation technology for enhancing thinking skills of pupils with special needs in Delta State. There is moreover, no significant difference in the mean ratings of male and female; and experienced and less experienced teachers on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in Delta State. Based on the findings, it was recommended among others that teachers should enhance skills in the use of ICT for improved use of computer animation technology.

Keywords: Primary education, computer animation technology, thinking skills, special needs, pupils

Introduction

Primary education refers to the first stage of formal education outside the home environment of a child. Primary education comes up after pre-primary and it is usually for children within the ages of 5-12 before they go to secondary schools. Primary education is designed to prepare the child for other higher levels of education. In many countries, primary education is compulsory for all children. In Nigeria, primary education is free, reducing the financial burden on parents and ensuring that every child has access to basic education, regardless of their background. According to Oluwatayo (2021), primary education is a pupil-centred environment that prepares and grooms the mind of a child for future academic endeavours under the tutelage of primary school teachers. Globally, primary education is recognized as a child's basic right and not a privilege. This implies that top priority should be given towards ensuring that every child unique characteristics, interests, abilities and learning needs are taken into cognizance in primary schools. In adherence to the 1994 Salamanca Statement, Delta State government has made remarkable strides in the implementation of inclusive education by promoting quality and equitable education for all, without exclusion, including those who may be potentially marginalized by learning needs.

In Delta State, primary schools are implementing inclusive education practices through mainstreaming. Mainstreaming is the integration of pupils with special needs into regular schools with special assistance in the course of teaching and learning in the classroom. In the National Policy on Education of the Federal Republic of Nigeria (2013), pupils with special needs are identified based on their visual impairment, hearing impairment, physical and health impairment, intellectual disabilities, emotional and behavioural disorders as well as speech and language impairment. Other category includes pupils with learning diabilities, multiple disabilities, the gifted and talented and albino. The Organization for Economic Co-operation and Development (OECD) in Van Der Steen, Steenbeek, Wielinski and Van Geert (2012) asserted that pupils with special education needs are learners who require additional public and private resources to support their education aspirations. The defintion of OECD grouped special needs pupils into three categories, which are; pupils with sensory, motor and neurological disabilities; pupils with emotional and behavioral difficulties and pupils with disadvantages due to socio-economic or linguistic factors.

In the light of the study, pupils with special needs are primary school children special needs which affect their ability to do well like normal colleagues of the same age within and outside the school environment. Pupils with communication challenges, mental and emotional issues and exhibit awkward behaviours when interacting with their age mates and other people in the society have special needs. The adoption of the 1994 Salamanca declaration enjoins institutions of learning to perceive and react to the needs of their learners through qualitative instructional practices that have inclusivity mechanisms (Kabutha, 2019). Therefore, the acceptance of pupils with special needs into mainstream primary schools demands consistent use of inclusive

practices that can support the teaching and learning process in these schools. Primary school teachers are expected to plan and organise their lessons, classroom, books and materials in ways that can make pupils with special needs become part and parcel of the instructional process because they progress at different rates and have different ways of learning.

A lot has changed however, educators believe that pupils with special needs should be mainstreamed into the formal classroom for better performance. It is envisaged that integrating pupils with special needs in the regular classroom can improve their thinking skills. According to Fiyola and Nur (2018), thinking is the ability to recognize problems, finding ways to deal with the problems, gathering information, compiling information, recognizing possibilities, understanding language, analyzing, evaluating facts, understanding cause and effect, drawing conclusions, test similarities, arrange patterns based on experience and make judgments. Sometimes, individuals with a special need have learning difficulties that limit their ability to build new knowledge with prior knowledge for subject matters to have meaning to them. Thus, thinking skills entails proficiency in decision making skills and problem-solving skills. This implies that the acquisition of thinking skills among pupils with special needs will help them to identify and solve problems creatively while understanding the opinions of others (Hendra, Sapto, Saharuddin, Sutarsi and Suhaeb, 2018).

In order to assist pupils to develop their thinking skills, technology is being applied in the recent times. One of these technologies is the computer animation technology. Computer animation technology is a visualization instructional setting that displays a series of pictures for educational purposes. According to Zanin (2015), computer animated technology entails the integration of animated videos, cartoons and sounds used by teachers in the presentation of information for better comprehension of subject matters. Computer animation technology is a technology-mediated instructional package that has the features of both audio and visual presentations for teaching pupils with special needs in inclusive classroom. According to Owolabi and Oginni (2014), computer animation technology is the synchronization of pictures, text, graphics, motion pictures and background sounds at the same time to enhance learners understanding of classroom subjects. It also includes the use of interactive elements such as graphics, text, video, sound and cartoons teaching. The vitality of computer animation technology enlivens the learning experience since it promotes flexibility of learning and allows a wider range of stimuli that can increase learners' engagement in the teaching and learning process (Urquiza-Fuentes, and Ángel, 2013). Similarly, Mou, Jeng and Chen (2013) asserted that computer animation technology is an enriched technological tool in which several pictures and images are displayed in sequence and frames in order to make the teaching and learning processes real and stimulating in the classroom.

Computer animation technology can be interesting and have the power to capture the attention and interest of the learners for hours without boring them. This is helpful to

learners since it possesses features that aid in learning difficult concepts that ordinarily would not have been possible. Hwang, Tam, Lam and Lam (2012) averred that the advantages of using computer animation technology in mainstream schools is based on the premise that it has the potential to meet the affective and cognitive needs of learners irrespective of their differences.

Cognitively, computer animation technology presents the abstract and difficult contents of a lesson in a dynamic and clear matter so that learners can learn easily in the classroom. Computer animation technology creates an inclusive classroom environment because it applies to both the sight and hearing senses thereby fostering the retentive memory of pupils with special needs (Hwang, Tam, Lam and Lam, 2012). In the long run, the teachers' usage of computer animation technology will enable both normal pupils and their peers with special needs appreciate one another, to break any barriers and to do away with stigmatization. This will instill confidence and enable learners with special needs to appreciate the fact that disability does not mean inability (Akpinar, 2014).

Teachers' use of computer animation technology can be designed to meet the educational aspirations of individual pupils with special needs by making the teaching and learning process more enjoyable. Using computer animation technology in mainstream primary schools afford pupils with special needs to interact with other learners, thereby expanding teachers' abilities to present instructional materials that encourage pupils' interaction with the subject matter. It is important to submit that the use of computer animation technology facilitate lifelong skills among pupils with special needs (Kabutha, 2019).

Studies have shown that teaching thinking skill is very crucial for lifelong achievement. Karakas (2012) investigated the use of cartoons for developing understanding and analyzing skills of children in pre-school period and found that animated cartoons contribute to the development of children's understanding and explaining skills. The study further disclosed that cartoons enhance language development, improvement of perception level, problem solving, creative thinking, decision-making skills and observation skills among children in pre-schools. In another study, Ghilzai, Alam, Ahmad, Shaukat and Noor (2017) examined the impact of cartoon programs on children's language and behaviour and found that children who watch cartoons show high level of language acquisition and cognitive development but they also show some aggressive and violent behaviours with their siblings and friends. Khoo and Robert (2017) examined students' critical thinking and performance after implementing Peer Learning with Concept Cartoons (PLCC) and revealed that Peer Learning with Concept Cartoons (PLCC) correlated with students' critical thinking and performance. Furthermore, the results showed that critical thinking and performance significantly correlated with the gender interaction. In another study, Anusiuba, Osuafor and Nweke (2019) examined the effects of animated media instructional strategies on the achievement and retention of senior secondary school students in computer studies in Anambra State and found that animated media instruction was significantly effective in

enhancing students' achievement in computer studies. Also, the study discovered that there is significant between the mean retention scores of students taught computer studies using animated-media instructional strategy and those taught using conventional method.

The efficacy of computer animation technology however, has not been established in teaching thinking skills among pupils with special needs. Moreover, the moderating influence of gender and teacher experience is yet to be determined. Gender is the behavioural characteristics distinguishing between males and females in any society. Gender, according, Ibe, Nwosu, Obi and Nwoye (2016), is determine by the roles, functions and tasks assigned to women and men in society. Nwaubani, Okechukwu and Ogbonnaya (2018) defines gender as the socially constructed definitions of women and men in the society as such, it is not to be confused with sex or the biological characteristics of women and men. Past research shows how gender divisions are naturalized and reproduced through technology. To begin with, technology often gets equated with "men's power." while women and girls are portrayed as less technologically skilled and less interested than their male counterparts. Such stereotypes can contribute to the gender gap in women's participation in related field (Manasi, Penchanadeswaran, and Sours 2023). Given the unbroken love of women for children, one can assume that female teachers' can use computer animation technology for enhancing skills of pupils with special needs more than their male counterparts, but this assertion needs to be supported with empirical evidence by using mainstream primary schools in Delta State.

Also, years of teaching experience refers to the professional experiences gathered by teachers over the years in primary schools. In the context of this study, experienced teachers are primary school teachers with more than 10 years of professional experience and less experienced teachers are educators with less than 10 years in service. Given their years of professional service, one can assume that experienced teachers may be able to use computer animation technology for enhancing skills of pupils with special needs than less experienced counterparts. Again, this assumption needs to be supported by empirical evidence. It is against this background that this study seeks to determine the teachers' use of computer animation technology for enhancing thinking skills of pupils with special needs in Delta State.

Statement of the Problem

Among the skills needed for advancement in education, thinking remains paramount. This is because most activities carried out in school require some measure of thinking. Special need learners need thinking skills to compete favourably with their counterparts and to become useful to themselves.

Unfortunately, teachers often employ the traditional methods of teaching that do very little to engage learners in critical thinking that will enhance their abilities. This has adverse effect on the special needs learners. Thus, if nothing is done to remedy the situation, the special needs pupils may end up not developing their thinking skills.

In recent times however, the computer animation technology has been employed in learning settings to enhance learning. Whether this is done in Delta State, however, is not known. The problem therefore is to ascertain whether teachers use computer animation technology in teaching thinking skills among pupils with special needs in Delta State.

Purpose of the Study

The main purpose of the study is to determine teachers' use of computer animation technology for enhancing thinking skills of pupils with special needs in Delta State. Specifically, the study intends to find out:

1. extent of teachers' use of computer animation technology for enhancing the thinking skills of pupils with special needs in Delta State.

Research Question

The following research question guided the study:

1. To what extent do teachers' use computer animation technology for enhancing thinking skills of pupils with special needs in Delta State?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean ratings of male and female teachers on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in Delta State.
2. There is no significant difference in the mean ratings of experienced and less experienced primary school teachers on the extent they use computer animation technology for enhancing thinking skills of pupils with special needs in Delta State.

Research Method

This study was carried out to determine the extent of teachers' use of computer animation technology for enhancing thinking skills of pupils with special needs in in Delta State. One research question and two hypotheses guided the study. Descriptive survey research design was employed for this study. The study was carried out in public primary schools in Delta State. The population of the study comprised 118 primary school teachers in the existing 28 public primary schools in Oshimili North and South Local Government Areas of Delta State. The entire population was studied without sampling because the population was manageable. The instrument for data collection was a nine-item structured questionnaire adapted from "Computer Animation Technology for Enhancing Skills of Pupils with Special Needs Questionnaire (CAT-ESPSNQ)". Face validation of the instrument was conducted by three experts. Two experts were from Early Childhood and Primary Education and one expert from measurement and evaluation unit of educational foundation all from the Faculty of Education in Nnamdi Azikiwe University, Awka. The reliability of the instrument was determined by administering the instrument to 20 primary school teachers in Aniocha North Local Government Area of Delta State which was not part of the study. Cronbach Alpha was used to determine the internal

consistency of the instrument which yielded reliability coefficient value of 0.78. Descriptive statistics of mean and standard deviation were used to analyse the research question while inferential statistics of t-test was employed for testing the null hypotheses at 0.05 level of significance.

Presentation of Results

Research Question 1: To what extent do teachers' use computer animation technology for enhancing thinking skills of pupils with special needs in Delta State?

Table 1: Respondents' Mean and Standard Deviation Ratings on the extent of teachers' use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms

S/N	Extent to which teachers use computer animation technology for enhancing	X	SD	Remarks
1.	analyzing skills among pupils with special needs	2.78	1.03	Moderate extent
2.	interpretation skills among pupils with special needs	3.94	0.89	Great extent
3.	self-correction skills among pupils with special needs	4.10	0.94	Great extent
4.	self-examination skills among pupils with special needs	3.94	0.91	Great extent
5.	co-operation skills among pupils with special needs	3.82	1.02	Great extent
6.	decision making skills among pupils with special needs	3.11	0.78	Moderate extent
7.	problem solving skills among pupils with special needs	3.09	0.86	Moderate extent
8.	creative skills among pupils with special needs	3.81	0.92	Great extent
9.	explanation skills among pupils with special needs	3.79	0.87	Great extent
	Cluster Mean	**3.59**		**Great extent**

Data presented in Table 1 reveals the item by item analysis of the extent of teachers' use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms in Delta State. The result analysis revealed that items 1, 6 and 7 with their respective mean scores of 2.78, 3.11 and 3.09 were rated moderate extent by the respondents; items 2, 3, 4, 5, 8 and 9 with mean scores 3.94, 4.10, 3.94, 3.82, 3.81 and 3.79 were rated great extent by the respondents. The cluster mean of 3.59 summarized that teachers to a great extent used computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms in Delta State. The standard deviation scores ranging from 0.78 – 1.03 means that respondents' mean ratings were closely related.

Hypothesis 1: There is no significant difference in the mean ratings of male and female teachers on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms in Delta State.

Table 2: t-Test analysis of the significant difference in the mean ratings of male and female teachers on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms

Variables	N	$\overline{X}$	SD	df	t-cal	p-value	α-value	Remark
Male	65	26.55	5.34	116	0.421	0.674	0.05	Not significant
Female	53	26.17	4.35					

Data presented in Table 2 show that at 116 degree of freedom and t-cal value of 0.674; the p-value is greater than 0.05 (df = 116; p > 0.05). This means that the null hypothesis is not rejected therefore there is no significant difference in the mean ratings of male and female teachers on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms in Delta State.

Hypothesis 2: There is no significant difference in the mean ratings of experienced and less experienced primary school teachers on the extent they use computer animation technology for enhancing thinking skills of pupils with special needs in Delta State.

Table 3: t-Test analysis of the significant difference in the mean ratings of experienced and less experienced teachers on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms

Variables	N	$\overline{X}$	SD	Df	t-cal	p-value	α-value	Remark
Exeprience	48	26.69	5.55	116	0.560	0.577	0.05	Not significant
Less-experience	70	26.17	4.43					

Data presented in Table 3 revealed that at 116 degree of freedom and t-cal value of 0.560; the p-value is greater than 0.05 (df = 116; p > 0.05). This means that the null hypothesis is not rejected therefore experienced and less experienced primary school teachers in Delta State did not differ significantly in their mean ratings on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms in Delta State.

Discussion of Findings

The finding revealed that teachers to a great extent used computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms in Delta State. This means that teachers are actively and extensively incorporating computer animation technology into their teaching practices. This technology plays a central role in their efforts to improve the thinking skills of pupils with special needs. Thinking skills include critical thinking, problem-solving, creativity, logical reasoning, and other

cognitive abilities that are essential for academic and personal growth. This finding agreed with that of Karakas (2012) and Khoo and Robert (2017) that computer animation technology effectively enhanced critical thinking skills in students. It encouraged them to analyze information, evaluate evidence, and make well-reasoned decisions. More so, the finding was in tandem with that of Ghilzai et al. (2017) that computer animations were found to be particularly effective in improving students' problem-solving abilities. Interactive scenarios and challenges in animations provided opportunities for students to practice and refine their problem-solving skills.

The corresponding hypothesis revealed that there is no significant difference in the mean ratings of male and female teachers on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms in Delta State. This finding opposed that of khoo and Robert (2017) that critical thinking and performance significantly correlated with the gender interaction. The difference in both findings could be as a result of change in the opinions of geographical location and varying opinions of respondents.

More so, the hypothesis revealed that experienced and less experienced primary school teachers in Delta State did not differ significantly in their mean ratings on the extent of use of computer animation technology for enhancing thinking skills of pupils with special needs in inclusive classrooms in Delta State. The use of the term "did not differ significantly" implies that statistical analysis has been applied to the data, and it was found that the differences in the mean ratings between experienced and less experienced teachers are not statistically meaningful. In other words, the observed similarities are likely due to random chance rather than any systematic difference.

Conclusion

The study has shed light on the significant role of computer animation technology in the education of pupils with special needs in Delta State. The use of this technology has shown promise in enhancing thinking skills. The findings of this study have indicated that teachers, both experienced and less experienced, are actively and extensively utilizing computer animation technology to support the development of skills that extend far beyond the classroom. Thinking skills have been positively impacted by the integration of computer animation technology. Furthermore, the study revealed that gender and experience do not play a significant role in the extent to which technology is used for enhancing these thinking skills.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Government of Delta State should develop and implement training teachers in the effective use of computer animation technology to support pupils with special needs in developing social skills.
2. The Delta State Government should ensure that schools have adequate computer animation technology to

support teachers in their efforts to enhance pupils' social skills.

3. Teachers should enhance their ICT skills to support inclusive education in Delta State.

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