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ARTIFICIAL INTELLIGENCE (AI) ASSISTED EDUCATION MEDIA AND ACADEMIC PERFORMANCE IN ENGLISH LANGUAGE AMONG STUDENTS WITH HEARING IMPAIRMENT IN OBIO/AKPOR LOCAL GOVERNMENT AREA OF RIVERS STATE, NIGERIA

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Abstract

This study investigated utilization of Artificial Intelligence (AI) assisted education media and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area of Rivers State. The study adopted correlational research design. The study was guided by three research questions and three null hypotheses. The population of the study comprised 86 senior secondary school students with hearing impairment in special schools in Obio/Akpor Local Government Area. The Census sampling technique was used to select 86 senior secondary school students with hearing impairment for the study. The instruments for data collection were a structured questionnaire, titled: "Artificial Intelligence Assisted Education Media Questionnaire" (AIAEMQ) and English Language Performance Test (ELPT). The instrument were validated by experts in the [redacted] Department of Special Needs Education. The reliability of the instruments were determined through test re-test reliability method which a reliability index of (AIAEMQ, r=0.72) and (ELPT, r=0.74). Pearson Product Moment Correlation (PPMC) was used to answer the research questions and test the null hypotheses at 0.05 level of significance. The study revealed that there was positive relationship between AI assisted wall chart, AI assisted videotapes, AI assisted realia and academic performance in English Language among students with hearing

Keywords: AI, academic, education, performance, media, students.

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impairment in special schools in Obio/Akpor Local Government Area. It further revealed that there was significant relationship between AI assisted wall chart, AI assisted videotapes, AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area. It was recommended among others that; Ministry of Education in collaboration with the administration of special schools should set up workshop for training teachers' on how to effectively adopt the use of Artificial Intelligence in the development of education media with the goal of boosting students' academic performance.

Introduction

Academic performance is the major concern of educational policy makers of every country. It has been accepted that environment both inside and outside the school in which the child grows has a great influence on the academic performance of the students. Academic performance has to do with what a learner is able to accomplish by execution of class work in the school. Stiggings (2021) saw academic performance as something a learner do or achieve at school, college or university, in class, in a laboratory or field work. Ling (2020) stated that academic performance refers to achievement of individuals' objective to various types of knowledge and skills. Academic performance entails the different means students respond to their academic materials assigned by their teachers. This explains that high academic performance is directly connected and measured by the outcome of an examination even for those with and without disabilities.

In the light of education for all, students are to be given equal access to quality and timely education irrespective of race, sex, family status or disability status (Ubani & Sanikpege, 2023). For students with disabilities, vis-a-viz, students with hearing impairment, Ubani and Sanikpege (2020) disclosed that hearing is one of the senses, which has a vital role in determining individual life as hearing has a distinct function of transferring an aspect of the social and environmental components of reality to the brain. The significance of hearing sense is demonstrated by the fact that hearing is a source of learning and knowledge acquisition as well as earning direct and indirect experiences. Hearing system transmits a spectrum and an unlimited amount of information about the surroundings.

Improvement in students' academic performance may be influenced by several teaching and learning resources that facilitates interaction among students and teachers during the learning/teaching process, as well as help students to learn, broaden students' learning experiences and meet different learning needs. If used effectively, such resources can help students to construct knowledge for themselves and develop effective learning strategies, generic skills, values and attitudes, thus laying a solid foundation for life-long learning (Hussain, 2018). There are technologies that encourage the development of creativity or provide experience not easily secured in any other way such as Artificial Intelligence (AI).

Artificial Intelligence (AI) was found to be systemic for students' ability to interpret, learn, and achieve specific tasks from data presentation. It refer to analytical, human-inspired intelligence because of the features it contains, together with the exhibited outputs that involve cognitive,

emotional, and social academic display of knowledge (Thango, 2020). In recent developments and advancements, several platforms have popularized mainstream usage of Artificial Intelligence as part of daily processes such as incorporating it in tools that are used in several industries. This has implicated the inclusion of AI systems in day-to-day usage, indicating the improved outcomes as a powerful tool to increase efficiency and quality of academic performance of students through the use of Artificial Intelligence (AI) powered educational media.

Okoba (2021) noted that by Artificial Intelligence (AI) enabled educational media, educators usually refer to using of educational media which offer an effective dialogue between the resource materials- indirectly with the instructor and the students in comparison with traditional methods of teaching which may lack such interactivity. Artificial Intelligence (AI) assisted educational media has the potential to create high quality learning environments especially for students, with the capability of creating a more pragmatic learning context through its different medias- texts, graphics, sound, animation among others. Artificial Intelligence (AI) assisted educational media resources have paramount importance in teaching (Altinyelken, 2019). With the help of Artificial Intelligence (AI) assisted educational media, one can present different phenomena and processes vividly, simulate complex content, and present different levels of abstraction. This may help in meaningful and authentic learning.

Carpenter (2021) noted that it is apparent that many of today's teachers at special and regular schools are caught in the midst of a change for which they may not have been professionally prepared as many teachers were educated in the classrooms where the role of the student was to memorize information, conduct well-regulated demonstrations etc. and were then tested on their ability to repeat these tasks or remember specific facts. It was against this background that the study examined utilization of Artificial Intelligence (AI) assisted education media and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area of Rivers State, Nigeria.

Statement of the Problem

The researchers' astute observation shows that students with disabilities do poorly academically on national examinations such as the West African Examination Council (WAEC). The bulk of these students, the study notes, hardly get 6-Credits, even in English Language. According to the researchers, the issue may have been as the non-use of Artificial Intelligence (AI) assisted educational media and which have been the focus of attention and research for a while. The continuous problem of mass failure in public examinations over the years has become an issue of concern to parents, school administrators and other stakeholders in education as failure in compulsory subject area like English Language which forms the basic criteria for admission into tertiary institution still persist. Some researchers are of the opinion that the problem must have emanated from poor and inadequate infrastructure, teaching methods and son, government on its own has tried to address this problem through workshops, seminars and other elated means to improve upon students performance but the problem still persist. It was based on this premise the issue of utilization of Artificial Intelligence (AI) assisted education media was being considered that brought into focus the investigation to determine if it had any relative effect on academic

performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area of Rivers State, Nigeria.

Aim and Objectives of the Study

The aim of the study was to investigate Artificial Intelligence (AI) assisted education media and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area of Rivers State. Specifically, the objectives were to;

1. Determine the relationship between AI assisted wall chart and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area
2. Examine the relationship between AI assisted videotapes and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area
3. Ascertain the relationship between AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area

Research Questions

The following research questions guided the study.

1. What is the relationship between AI assisted wall chart and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area?
2. What is the relationship between AI assisted videotapes and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area?
3. What is the relationship between AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area?

Hypotheses

The following null hypotheses were formulated to guide the study.

1. There is no significant relationship between AI assisted wall chart and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area
2. There is no significant relationship between AI assisted videotapes and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area
3. There is no significant relationship between AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area

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Method

The study employed a Correlational research design. The population of the study comprised 86 senior secondary school students with hearing impairment in special schools in Obio/Akpor Local Government Area of Rivers State. Census sampling technique was used to select the entire sample of 86 senior secondary school students with hearing impairment for the study. The research instruments were a self-designed instrument titled "Artificial Intelligence Assisted Education Media Questionnaire" (AIAEMQ) and English Language Performance Test (ELPT). The AIAEMQ instrument contained four (4) sections with a total of 15 items statements. Section A; contained Bio-data of the respondents, Section B; contained item statements on AI assisted wall chart, Section C; contained item statements on AI assisted videotapes, Section D; contained item statements on AI assisted realia. The "Artificial Intelligence Assisted Education Media Questionnaire" (AIAEMQ) had 35 items structured on a four point modified Likert Scale of Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1. The English Language Performance Test (ELPT) contained 20 items with four options in which one was the correct answer, while the rest three options were distractors. Five (5) marks was awarded to each correctly answered question. To determine the reliability of the instruments, the researcher used test re-test reliability method which yielded a reliability index of (AIAEMQ, r=0.72) and (ELPT, r=0.74). The Pearson Product Moment Correlation was used in answering the research questions and testing the null hypotheses at 0.05 level of significance. The data collected were analyzed with the aid of Statistical Package for Social Science (SPSS) version 25.0.

Research Question One:

What is the relationship between AI assisted wall chart and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area?

Hypothesis One:

There is no significant relationship between AI assisted wall chart and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area.

Table 1: ***Pearson's Product Moment Correlation between AI Assisted Wall Chart and Academic Performance in English Language among Students***

		AI Assisted Wall Chart	Academic Performance
AI Assisted Wall Chart	Pearson Correlation	1	.601
	Sig. (2-tailed)		0.001
	N	86	86
Academic Performance	Pearson Correlation	.601	1
	Sig. (2-tailed)	0.001	
	N	86	86

**. Correlation is significant at the 0.05 level (2-tailed).

Table 4.1 of Pearson's Product Moment Correlation results reveal that r-value of .601with its corresponding p-value of 0.001< 0.05 (which is less than) the chosen level of significance was

gotten. This shows a strong positive correlation between AI assisted wall chart and academic performance in English Language among students with hearing impairment in special schools. Since the p-value is less than the chosen significant level, the null hypothesis **is rejected**. The implication of the result is that there is significant relationship between AI assisted wall chart and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area.

Research Question Two:

What is the relationship between AI assisted videotapes and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area?

Hypothesis Two:

There is no significant relationship between AI assisted Videotapes and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area.

Table 2: ***Pearson's Product Moment Correlation between AI Assisted Videotapes and Academic Performance in English Language among Students***

		AI Assisted Videotapes	Academic Performance
AI Assisted Videotapes	Pearson Correlation	1	.729
	Sig. (2-tailed)		0.001
	N	86	86
Academic Performance	Pearson Correlation	.729	1
	Sig. (2-tailed)	0.001	
	N	86	86

**. Correlation is significant at the 0.05 level (2-tailed).

Table 2 of Pearson's Product Moment Correlation results reveal that r-value of .729 with its corresponding p-value of 0.001< 0.05 (which is less than) the chosen level of significance was gotten. This shows a positively strong correlation between AI assisted videotapes and academic performance in English Language among students. Since the p-value is less than the chosen significant level, the null hypothesis **is rejected.** The implication of the result is that there is significant relationship between AI assisted videotapes and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area.

Research Question Three:

What is the relationship between AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area?

Hypothesis Three:

There is no significant relationship between AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area.

Table 3: ***Pearson's Product Moment Correlation between AI Assisted Realia and Academic Performance in English Language among Students***

		AI Assisted Realia	Academic Performance
AI Assisted Realia	Pearson Correlation	1	.700
	Sig. (2-tailed)		0.001
	N	86	86
Academic Performance	Pearson Correlation	.700	1
	Sig. (2-tailed)	0.001	
	N	86	86

**. Correlation is significant at the 0.05 level (2-tailed).

Table 3 of Pearson's Product Moment Correlation results reveal that r-value of .700 with its corresponding p-value of 0.001< 0.05 (which is less than) the chosen level of significance was gotten. This shows a positively strong correlation between AI assisted realia and academic performance in English Language among students. Since the p-value is less than the chosen significant level, the null hypothesis **is rejected**. The implication of the result is that there is significant relationship between AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area.

Discussion of Findings

AI Assisted Wall Chart and Academic Performance in English Language among Students

Data in table 1 of Pearson Product Moment Correlation results revealed an r-value of .601 with its corresponding p-value of 0.001<0.05 (which is less than) the chosen level of significance was gotten. This shows a positively strong correlation between AI assisted wall chart and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area. The study indicated that an increase in the utilization of AI assisted wall chart led to an increase in the academic performance of students with hearing impairment in English Language. The finding is in tandem with the revelation of Haycraft (2018) who revealed that Artificial Intelligence usage in the production of wall chart such as a large pictures when used for introducing new vocabulary placed next to the blackboard or on the board itself enhanced the academic performance of students in different subject areas.

AI Assisted Videotapes and Academic Performance in English Language among Students

Data in table 2 of Pearson Product Moment Correlation results revealed an r-value of .729 with its corresponding p-value of 0.001<0.05 (which is less than) the chosen level of significance was gotten. This shows a positively strong correlation between AI assisted videotapes and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area. The study indicated that an increase in the utilization of AI assisted videotapes led to an increase in the academic performance of students with hearing impairment in English Language. The finding is in agreement with the study of Stiggings (2021) who revealed that Artificial Intelligence (AI) when used to generate educational videotapes had the

potential of increasing the probability of students learning, improved students' retention rate and thus improve academic performance of students in regular and special schools.

AI Assisted Realia and Academic Performance in English Language among Students

Data in table 3 of Pearson Product Moment Correlation results revealed an r-value of .700 with its corresponding p-value of 0.001<0.05 (which is less than) the chosen level of significance was gotten. This shows a positively strong correlation between AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area. The study indicated that an increase in the utilization of AI assisted/developed realia led to an increase in the academic performance of students with hearing impairment in English Language. The finding is in tandem with the study of Okoba (2021) who revealed that realia when developed through he aid of Artificial Intelligence and it's been used within the learning environment, connects learners with the key focal point of a lesson by allowing tactile and multidimensional connection between learned material and the object of the lesson and ultimately enhances students performance in school.

Conclusion

Based on the findings of the study, the researchers concluded that there was positive relationship between AI assisted wall chart, AI assisted videotapes, AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area. It further revealed that there was significant relationship between AI assisted wall chart, AI assisted videotapes, AI assisted realia and academic performance in English Language among students with hearing impairment in special schools in Obio/Akpor Local Government Area of Rivers State.

Recommendations

Based on the findings of the study the researcher made the following recommendations:

1. Ministry of Education in collaboration with the administration of special schools should set up workshop for training teachers' on how to effectively adopt the use of Artificial Intelligence in the development of education media with the goal of boosting students' academic performance;
2. Wall charts and Realia that were developed through Artificial Intelligence (AI) should be made available either by parents, government agencies or non-governmental organizations for students' utilization as it enhances and promotes the academic performance of the students;
3. Curriculum development bodies in Nigeria especially National Educational Research and Development Council (NERDC) should design programmes to incorporate the utilization of Artificial Intelligence (AI) assisted educational media in teaching and learning especially at special schools.

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