

INFLUENCE OF SMART CLASSROOM ENVIRONMENT ON STUDENTS' INTEREST AND ACTIVE ENGAGEMENT

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Abstract: *This study investigated the influence of smart classroom on secondary school students' motivation and active engagement in learning. Two hypotheses were raised in the descriptive research design study. The sample comprised of students of the purposively selected international private schools in Lagos State. Data was collected through administration of questionnaire that was validated with reliability coefficient values of 0.85. Data were analyzed using inferential statistics of chi-square. The study found significant influence of smart classroom environment on students' motivation towards learning ($X^2 = 87.69$, $df = 3$, $p < 0.05$). The study also found significant influence of smart classroom environment on students' active engagement towards learning ($X^2 = 97.68$, $df = 3$, $p < 0.05$). Based on the findings, it is recommended that since majority of the learners agreed that it provides motivation, school administrators should encourage their teachers for its uses in all subjects. As a result of the active engagement it provides for students, instructional designers should integrate it in the curriculum planning and development.*

Keywords: smart classroom; motivation; active engagement; curriculum; instructional design.

1. Introduction

Education stakeholders are worried about traditional methods of teaching-learning in the schools and efforts are being made similarly to introduce innovative learning strategies, especially those that could be supported with technology. Technology as a phenomenon has been

ever growing in the field of education as a tool for teaching, management and evaluating purposes. A Smart classroom environment is one of the easiest modes of resources that can be used to convert old-fashioned traditional educational systems into modern ones with the help of emerging technologies. Some teachers are making moves to shifting away from the conventional lecture method and have embraced highly technology supported (smart) classroom.

A classroom is an environment for the transition of knowledge from a teacher to a group of students. The use of emerging technologies in classroom to aid knowledge sharing is referred to as smart classroom (Barak & Sharp, 2021). A smart classroom is one that foster opportunities for teaching and learning by integrating interactive multimedia learning technologies such as computers, interactive white board, specialized learning software, interactive response system, assistive listening devices, internet facilities, document camera(docucam), clickers, smart podium, smart audio and audio-visuals. The environment of a smart classroom is centered on technology where the teacher and the students interact through interactive whiteboard and typically equipped with computer technologies, digital photographic camera, digital video camera, consoles, scanners, printers, microphone, multimedia projectors etc. A smart classroom environment will provide hands-on experience, motivation, collaboration, creativity, critical thinking, individualized learning, immediate feedback, interactive content, online assessment, automated roll call and active students' engagement thereby providing the expected learning outcomes. Smart classrooms will undoubtedly enhance lecture theatres and classrooms digitally, thereby creating a highly motivating and students' active engagement environment.

Gardner (2018) in a study compared schools with and without smart classrooms with a view to determine students' achievement. The study found improved learning in this strategy compared to traditional teaching and students in schools with smart classrooms are highly motivated towards achievement. Scholes (2020) studied the high school students' attitude towards smart board used in Biology classes, majority were found with positive attitude towards smart board, students did not differ statistically with respect to the variables of gender and smart board use time. Young (2018) opined that students in smart classes are likely to gain better than their counterpart in the traditional classroom in view of the multimedia package imbedded in the digital presentation package.

However, some studies show that interactive whiteboards may not necessarily increase students' performance, especially when not properly managed by facilitators. For example, some advanced ideas

that learners can lose concentration while others can be watching irrelevant contents; reasons the teacher must pay attention to see whether learners are doing what they are intentionally supposed to do. Studies also revealed that inadequate teacher's knowledge and skills in the application of information technology (IT) as a medium of teaching is one of the problems hindering students' academic performance (John & Wilson, 2019)

Studies indicate that students are likely to be motivated in a smart classroom than the traditional classes as learning could be influenced through intrinsic factors. Motivation is the reason a person does something or the driving force behind man's action. Motivation is a psychological construct that initiates, guides and maintains positive action in man. It helps learners to focus attention on learning outcomes and avoid distraction. Motivation is the internal willingness for wanting to learn (Malak & Malls, 2018). The intrinsic drive that is generated can spark an enhancement in students' academic performance. Students' motivation is a psychological state of having an effective response to and focusing attention on particular contents. Motivation has been found to have a powerful influence on student's learning, with greater interest leading to greater persistence and academic achievement. Smart classroom is a means of generating intrinsic motivation as a path to academic success, especially among students in junior classes.

In a study, Clement et al., (2018) examined the relationship between the use of smart classroom and Australian students learning interest, the results show significant relationship. McPherson (2020) investigated the impact of smart classroom on the attitude of selected students in Denmark schools, the study found significant influence of smart classroom environment on students' attitude towards learning. On the other hand, Armstrong (2021) in a study on the attitude of students towards smart classroom found no significant influence on students' attitude.

Another variable of interest in this study is how students may be engaged effectively through smart classroom environment. Students' engagement has been defined as extrinsic curiosity to participate and be successful in the learning process (Ibrahim & Kharashi, 2021). Content delivery in smart classroom requires pedagogical strategies that will create as many learning and engagement opportunities as possible. Looking beyond cognitive skills learned or mastered, engagement focuses on individuals' activeness in classroom experiences and life-long learning. Student engagement has also been described as the level of participation demonstrated by students and how they interact with others in the course. By evaluating the level of students' engagement, instructors can more effectively plan lessons

and activities that will encourage students to be more active participants in their learning and coursework.

Hug and Lash (2022) in a descriptive study on smart classroom engagement found that majority of respondents (85%) agreed that smart classroom encourages collaborative skills. In another survey, Farook (2021) reported that majority of the teachers who responded to the questionnaire agreed that smart classroom promotes hands-on experience among the students. On the other hand, Lussvill (2021) found no significant influence of online smart classroom on students' development of psychomotor skills.

Studies have shown that information technology significantly facilitates students' active engagement thereby improving higher order thinking in the classroom (Dottman & Lamphon, 2023). Perhaps with persistence efforts on the learning task and active participation there is desire to undertake more tasks. Information technology will significantly engage the students while working on the internet through virtual excursion, virtual reality, artificial intelligence, augmented reality, collaborative activities, mindtools, games and simulation. Also, students are actively engaged with digital technologies by creating web page, by communicating through electronic bulletin boards, chatting, videoconferencing and the smart boards.

Smart classroom is an intelligent class that incorporates innovative learning methods with emerging digital technologies (Thomson & Joy, 2019). Various investigations have been carried out to addressing various aspects of intelligent classes such as transforming traditional classroom into intelligent classroom. However, there are still some questions about smart classrooms that need to be empirically analyzed, such as students' motivation and engagement. It is against this background that this study investigates the impact of smart classroom on secondary school students' motivation and engagement.

The theoretical framework for this study is constructivism theory by Jean Piaget (1896-1980), which holds that learning is built upon that knowledge which is already known by students. Constructivist learning theory beliefs that all knowledge is constructed on the basis of previous mental knowledge, understandings and experiences. According to Piaget (1964), in order to truly know an object, you must act on it. The accreditation of constructivist teaching is that learning is more effective when a student is actively engaged in the learning process rather than attempting to receive knowledge passively (Jonassen, 1991). A shift from teacher centered education to learner centered education in which learners guide his own learning is needed to enable students acquire 21st century knowledge and skills; in which information communication technology (ICT) is inclusive. It has been observed that ICT is influencing learning through facilitation of active

students' engagement. ICT decreases memorization and rote learning while increases learning with longer retention, activeness and increased performance. For constructivist learning, it is essential that ICT will provide more opportunities for students' participation in learning process, increased motivation, creativity, critical thinking, reinforcement, team work, self-regulated study, self-evaluation as well as peer evaluation, and less examination-oriented teaching-learning (Gray, 2016). Information technology will undoubtedly promote constructivism among learners through higher order thinking, interactivity, cooperation and learning-by-doing; through digital demonstration, gamification, simulation, tutorial, drilling, augmented and virtual reality. ICT will also facilitate students' cognitive engagement through persistence and joyful desire to engage in tasks. A smart classroom environment with smartboard and other digital devices will engage the students to work on internet through virtual excursion, will engage students through hand-on experience, will engage the students through collaboration with other students and promote student - centered instructional approach.

Statement of the Problem

A smart class is an innovative strategy for technology- embedded digital education in a classroom environment. Studies have shown that a technology-driven learning environment enhanced students' attitude and performance in many disciplines, especially in developed climes. Smart classroom is an emerging educational technology in Nigeria schools and how it will be embraced depends on the motivation and engagement it provides for the students. Therefore, there is need to investigate if smart classroom provides the envisaged intrinsic motivation and extrinsic engagement for Nigerian students.

Hypotheses

H01: There is no significant influence of smart classroom on student's motivation to learning.

H02: There is no significant influence of smart classroom on students' active engagement in classroom activities.

2. Methodology

The study adopts a survey research design. The population consists of all the students in the forty (40) international schools in Lagos State, Nigeria. One thousand (1000) students were sampled in the study. Multistage sampling technique was used. In the first stage, purposive sampling technique was used to select the forty international schools in Lagos state because they are sufficiently equipped with Smart classroom facilities e.g, computers, digital educational hardware,

software, multimedia projector and smartboard etc. The second stage, proportional sampling technique was used to select 50% i.e (20) out of the forty international secondary schools. In the third stage, simple random sampling technique was used to select fifty students in each of the selected schools making a total of one thousand students.

The instrument used in this study was a questionnaire adapted from Watinge & Mathawgiong (2020) on secondary school students' attitude towards the use of Smart Classroom. The instrument is divided into sections A and B. Section A seeks demographic data of the respondents while section B is sub-divided into B (i) and B (ii). Section B (i) is a thirty item that measures students' motivation through smart classroom, while section B (ii) is a thirty item that measures students' active engagement through smart classroom. It's a four-point likert rating scale with strongly agreed, agreed, disagreed and strongly disagreed. It was subjected to construct and content validity through experts in Educational Technology while internal consistency was ensured through Cronbach Alpha method which yielded 0.85 reliability coefficient value.

The instrument was administered by two research assistants who were closely monitored by the researchers in order to ensure all the questionnaires were duly completed by the students in the selected schools. The cooperation of the students was sought through the class teachers for smooth administration of the questionnaires. Data collected was statistically analyzed through inferential method of Chi-Square (χ^2).

3. Results

H01: There is no significant influence of smart classroom on student's motivation to learning

Table I: Chi-square result of the influence of smart classroom on student's motivation to learning

Opinions	Observed Frequency	Expected Frequency	X^2 -Cal	X^2 -Tab	Df	emark
Agreed	620 (62%)	100.0%	87.69	3.84	3	Sig.
Disagreed	380 (38%)	100.0%				

Values in parentheses ($X^2 = 87.69$, $df = 3$, $P < 0.05$).

The results reveal that 62% of the respondents agreed that smart classroom has significant influence on students' motivation to learning as against 38% of respondents who disagreed. The chi-square calculated value of 87.69 was greater than the chi-square table value of 3.84 at

0.05 level of significance and at 3 degrees of freedom. The null hypothesis is therefore rejected, which implies that smart classroom has significant influence on students' motivation to learning.

H02: There is no significant influence of smart classroom on students' active engagement in classroom activities.

Table 2: Chi-square result of the influence of smart classroom on students' active engagement in classroom activities

Opinions	Observed Frequency	Expected Frequency	X^2 -Cal	X^2 -Tab	Df	emark
Agreed	765 (76.5%)	100.0 %	97.68	3.84	3	Sig.
Disagreed	235 (23.5%)	100.0 %				

Values in parentheses ($X^2 = 97.68$, $df = 3$, $P < 0.05$).

The results in Table 2 reveals that 76.5% of the respondents agreed that smart classroom has significant influence on student's active engagement in classroom activities as against 4% of respondents who disagreed. The chi-square calculated value of 97.68 was greater than the chi-square table value of 3.84 at 0.05 level of significance and at 3 degree of freedom. The null hypothesis is therefore rejected, which implies that smart classroom has significant influence on students' active engagement in classroom activities.

4. Discussion

In hypothesis one, the result shows significant influence of smart classroom on students' motivation towards learning. The finding is in line with Clement et al., (2018) who found significant relationship between the use of smart classroom and students' interest and McPherson (2020) who found significant influence of smart classroom on students' attitude towards learning.

In hypothesis two, the result shows significant influence of smart classroom on students' active engagement. The results support Farook (2021); Hug and Lash (2022) who found that majority of the teacher respondents agreed that smart classroom promotes hands-on-experience and encourages classroom collaboration.

5. Conclusion

The study investigates if smart classroom provides the envisaged intrinsic motivation and active engagement to students generally. However, the analysis of results established that smart classroom has significant influence on students' motivation to learning and student's

active engagement in classroom activities. Therefore, it is concluded that the digitally driven innovative classroom environment is a welcome pedagogy due to its learner - centeredness features.

6. Recommendations

Since majority of the learners agreed that it provides motivation, school administrators should encourage their teachers for its use in all subjects. As a result of the active engagement the technology provides for the students, instructional designers should integrate it in the curriculum. The use of smart classroom should be introduced in all public schools in Nigeria as it were in the private schools. There should be adequate funding of schools in terms of supply of emerging technological facilities for setting up smart classroom. Both Pre-service and In-service teachers should be trained for adoption of smart classroom in their practice. Robust internet infrastructure is crucial for implementing smart classroom facilities.

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