

Effects of WhatsApp Learning Platform on Attitude Towards Learning of Integrated Science Education among University Undergraduates in Ekiti State, Nigeria

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ABSTRACT

This study investigated effects of Whatsapp learning platform on attitude towards learning of Integrated Science education among University undergraduates in Ekiti State. The population consisted of 1,219 undergraduates studying Integrated Science Education in the three public University in Ekiti State, Nigeria. The study sample consisted of 200 undergraduate students at the 200 level with purposive sampling technique. One research instrument tagged Integrated Science Attitudinal Test (ISAT) was used to collect data on attitude towards learning of Integrated Science. It consisted of 30 single-answer questions drawn from the course outline for Energy and Matter 1 (SED 224). The instrument comprised two sections: Section A captured the personal data of the respondents, while Section B consisted of 30 items. Correct option attracted 1mark and wrong option attracted zero mark. The validity of the instruments was ensured through expert review which was subjected to face and content validity checks. The reliability of the instrument was determined through pilot testing. It was administered to a group of students with similar characteristics to the study sample, but who were not part of the main study. The test- retest method was used to establish its stability over time, and a reliability coefficient of 0.82 was obtained, confirming its consistency in measuring students' attitude towards learning of Integrated Science. The data collected analyzed using descriptive and inferential statistics. The research question was answered using descriptive statistics of mean and standard deviation. Hypotheses 1-2 were tested using t-test analysis. The two hypotheses were tested at 0.05 level of significant. The finding showed that there was no difference in the attitude towards learning of Integrated Science education among University undergraduates in the two groups before the treatment which means that both groups were homogeneous. The findings of this study also showed that undergraduates taught using the WhatsApp Learning Platform exhibit more positive attitude towards learning of Integrated Science than those taught using the Conventional Method. It was therefore recommended Lecturers should consider incorporating the WhatsApp Learning Platform as a supplementary tool in teaching Integrated Science to enhance student engagement. Universities should provide training for lecturers on the effective use of digital platforms like WhatsApp to improve instructional delivery and students' positive attitude.

Keywords; Whatsapp Learning Platform, Students' Attitude, Lecturers, University Undergraduates and Integrated Science Education

INTRODUCTION

The three main areas of scientific study are Integrated Science, chemistry, and physics are brought together in the field known as basic science. The program was developed and implemented in Nigerian elementary

schools with the goal of fostering the next generation of scientists by imparting to pupils a foundational understanding of science and the scientific method. There is no way to overstate the importance of Basic Science as a foundational topic that lays the groundwork for all other branches of science, instills a love of learning in pupils and fosters an appreciation for the wonders of the natural world. A course in basic science is one that aims to teach students the purpose and function of science by introducing them to the idea of the unity of science and the commonality of approach to problems of a scientific character. The advancements in applied science and technology that have their roots in basic science—also called fundamental scientific studies—have laid the groundwork for a knowledge society.

The course covers both living and nonliving objects as part of its Integrated Science curriculum. It brings together every branch of science, including physics, Integrated Science, health, agriculture, geography, and many more.

This program's primary goals are outlined in the National Policy on Education (2014) for Basic Science:

- To provide students with the necessary abilities to succeed in both the lab and the field.
- In order to better inculcate practical and useful knowledge in the field of Basic Science, and,
- To foster rational and practical scientific attitudes; to improve people's capacity to use scientific knowledge in solving real-world problems related to agriculture, public health, and daily life.

It is impossible to exaggerate the significance of scientific knowledge and technological advancements to the progress of any nation. Reason being, a society's progress depends critically on its members' scientific and technological literacy (Omebe and Omiko 2015). This implies that a well-designed and executed science curriculum is essential for producing citizens who are both scientifically literate and capable of handling the rigors of real life.

Students in Nigeria are required to take Basic Science at both elementary and secondary schools, as well as in universities. At the university level, it is a prerequisite for all science-related studies. As a result, students are given the chance and the incentive to pursue degrees in science and related fields. Among the several scientific courses offered by Nigerian universities' faculties of education is a foundational one in basic science. A degree from the university may be yours at the end of the four-year program.

The undergraduate performance in Basic scientific Education has not reached the commendable level anticipated for a scientific foundational topic, despite the subject's relevance and practicality. Aiming for a distinction (first class or second class upper) in all three parts of the curriculum is anticipated of Integrated Science graduate. If your grade is lower than this, it means you're really lacking in several parts of the topic. A thorough understanding of all aspects of the topic is crucial and must not be compromised in order to be a competent Integrated Science teacher at the elementary school level. According to reports, the Department of Science Education's Basic Science graduates' final scores over the last five years have fallen short of the anticipated degree of distinction. It follows that the nation's hopes of producing the next generation of scientists may remain pipe dreams. Reason being, less robust than anticipated Basic scientific, the bedrock upon which all other scientific and applied science courses rest. A number of elements may contribute to students' current performance status, including their academic aptitude, attitude toward learning, classroom attendance and their involvement in online learning. The teaching of Integrated Science cannot be done effectively in classroom and in laboratory alone; online teaching should be incorporated to compliment it (Oniya T., 2025)

According to Pratama and Yusro (2016), online learning serves as a viable alternative in today's era of rapidly advancing technology and communication. The COVID-19 pandemic further underscored the necessity of adopting online models and applications to achieve learning objectives (Amal, 2019). This situation has heightened the importance of innovation in education to sustain the progress of global learning systems (Hadi, 2015).

Online learning platforms like WhatsApp, with their multimedia-sharing capabilities, provide educators

with tools to deliver diverse and engaging content that supports various learning styles.

Whatsapp learning platform has revolutionized education by inspiring students to attain their full potential, providing them with personalized learning plans, and facilitating learning in ways that were previously impossible. With the right approach, it can "invoke dreams in the minds of visionary educators who saw endless potential for altering traditional notions of teaching and Whatsapp learning platform could positively affect students' attitude lead to decrease in absenteeism, lower dropout rates, and motivate more students to continue getting educated." If implemented properly, these resources have the potential to revolutionize the way students learn. Confidence and self-esteem are likely to grow in students who make frequent use of internet resources for their coursework. There is a risk that using online services might lead to excessive spending, time wasted, diversion, cheating, and other negative outcomes. On this premise, this study was designed to find out the extent to which online facilities and technologies such as Whatsapp learning platform affect students' attitude to learning of Integrated Science in some Universities.

Consequently, integrating WhatsApp into the learning process can play a crucial role in enhancing student motivation and expanding knowledge, particularly in the digital era where mobile-assisted learning is increasingly valued. Group WhatsApp Messenger is a discussion feature that can accommodate up to 256 participants within a single virtual space, allowing members to share information and engage in discussions in real time. This makes it a practical tool for facilitating collaborative learning activities. For example, courses such as Development of Learning Resources and Media can be effectively implemented through online learning supported by WhatsApp. The concept of online learning, which emerged in the early 1990s, opened the possibility for blended learning a model that integrates digital and face-to-face evolved to merge classroom learning with online activities, reflecting the natural tendency of learners to connect new knowledge with their prior understanding.

As an internet-based social media application, WhatsApp enables users to share various types of content through its diverse features. WhatsApp Messenger, particularly through its Group feature, offers an engaging platform for collaborative learning by facilitating discussions on a range of topics provided by educators. Its widespread use is closely linked to the emergence of the digital generation often referred to as the Net Gen who are accustomed to rapid updates and interaction with internet-based technologies. This generation prefers collaborative learning, tends to respond poorly to traditional lecture methods, seeks personalized information access, and values diverse learning materials available via technological devices, most especially alter students' attitude towards learning.

According to Adedayo (2015) submitted that attitude as a very crucial variable when dealing with the way one responds to an issue, especially learning of Basic Science. The attitude could be considered as the outcome of one's impression about something or better still, one's perception of something. Adodo and Gbore (2012) observed that negative attitude of students towards science subjects affected the enrolment and performance of students in sciences. Attitude is described as a perception or a general feeling towards something. According to Nwagbo, (2016), the attitude of a student triggers his behavior. Attitudes are antecedents which serve as inputs or stimuli that trigger actions (Nwagbo, 2016). also reported that students' positive attitudes to science correlate highly with their science achievement. It can then be adjudged that one's attitude to something manifests in the way he/she would respond to issues that pertain to the thing. This is applicable to learning, which involves full concentration of the learners' attention. Thus, the attitude of students contributes immensely to their academic progress (Adedayo, 2015).

Students' adaptive attitudes create space and flexibility for self-organization, which can contribute significantly to their success and achievement in learning (pratama & Yusro, 2016). Research on e-learning generally addresses three key perspectives. The first perspective focuses on online learning as a new media system that can promote more effective instructional practices and enhance student satisfaction. Amry (2014) supports this view, emphasizing that online learning involves selecting components that improve student engagement with content (Boyinbode, Agbonifo, & Ogundare, 2017). According to Amal (2019), four main considerations are essential in designing online learning instruction. Preliminary interactions with a few Integrated Science undergraduates suggest that some students believe learning through WhatsApp might help them review lessons at their own pace, access resources at any time, and engage more in discussions without the

constraints of the classroom setting. Others, however, express concerns that learning through a social media platform could lead to distractions, reduce discipline in study habits, and weaken face-to-face interactions with lecturers.

Another important issue is that of the influence of gender and teaching strategies in science. Oludipe (2012) described the main focus of great concern in the field of science education are the biases and misconceptions about women and science, i.e. science is a male enterprise. Many researches according to Oludipe (2012) had been carried out on gender issues in science education. (Onu, et al., 2020).) opined that many researchers have provided reports that there are no longer distinguishing differences in the cognitive, affective and psychomotor skill achievements of students in respect of gender. This study therefore, investigates the effects of collaborative instructional strategy on learning outcomes in Integrated Science in secondary schools in Ekiti State. Given these varied perspectives, there is a need to systematically investigate how students' attitudes toward learning of Integrated Science Education are shaped when taught using the WhatsApp learning platform compared to those taught through the conventional method. The outcome of such an investigation could provide insights into whether integrating mobile-based social media platforms into Integrated Science instruction can enhance positive attitudes among students.

Purpose of the Study

The purpose of this study was to investigate effects of whatsapp learning platform on attitude towards learning of Integrated Science education among University undergraduates in Ekiti State. The study specifically;

1. investigated the attitude of undergraduates towards learning of Integrated Science before and after exposure to the WhatsApp Learning Platform and the Conventional Method;
2. determined the difference in the attitude of undergraduates taught using the WhatsApp Learning Platform and those taught using the Conventional Method in Integrated Science;

Research Questions

One research question was raised to guide this study:

1. What is the attitude of undergraduates towards Integrated Science before and after exposure to Whatsapp learning platform and conventional method?

Research Hypotheses

The following hypotheses were formulated and tested in this study:

1. There is no significant difference in the attitude of undergraduates in the experimental and control groups before exposure to treatment in Integrated Science.
2. There is no significant difference in the attitude of undergraduates taught using the WhatsApp Learning Platform and those taught using the Conventional Method in Integrated Science.

Delimitation of the Study

The study was delimited to the effect of the WhatsApp Learning Platform on 200-level Integrated Science education undergraduates' attitude in public universities located in Ekiti State, Nigeria. It was also delimited to the specific concepts taught during the experimental phase of the study in SED 224. These concepts include; definition of energy, sources of energy, measurement of energy, the energy cycle, uses to man and how to mitigate energy crisis in the world.

Research Design

This study adopted a two group quasi-experimental research of the pre-test, post-test and control group design.

The design will employ the effects of independent variable on the dependent variable. Students' attitude towards learning of Integrated Science will be established by the Attitudinal questionnaire which will be conducted on both the experimental group and control group to ascertain the homogeneity. Post-test will be conducted after the treatments had been administered to measure the effect of the treatment on the change in attitude of the student in both experimental and control group'. While the control group would be exposed to convectional teaching method the experimental group on the other hand would be exposed to treatment using Whatsapp learning platform (WLP).

Population

The population for the study consisted of all the 719 undergraduates studying Integrated Science Education in all the Public University in Ekiti State, Nigeria. The choice of 200 Level Integrated Science education students seems to be more appropriate because they will be readily available for the treatment being not engage in teaching practice or undergraduate project research.

Sample and Sampling Technique

The study sample consisted of 237 undergraduate students at the 200 level, drawn from two public Universities in Ekiti State, Nigeria. A purposive sampling technique was employed in selecting the sample. The three Universities were chosen because they offered Energy and Matter 1 (SED 224) as part of their Integrated Science curriculum, with little or no variation in course content and academic calendar. Purposive sampling was considered appropriate as it ensured the selection of a sample that was directly relevant to the study objectives and had uniform exposure to the course.

Research Instrument

Research instrument employed to generate data for the study, was a self-designed questionnaire titled the Integrated Science Attitudinal Scale (ISAS). The instrument comprised two sections: Section A captured the personal data of the sample, while Section B consisted of 15 items measuring students' attitudes towards learning of Integrated Science. The ISAS was structured on a four-point Likert-type scale, ranging from Strongly Agree (SA = 4), Agree (A = 3), Disagree (D = 2), to Strongly Disagree (SD = 1).

Validity of the Instrument

The validity of the instruments was ensured through expert review. The Integrated Science Attitudinal Scale (ISAS) was subjected to face and content validity checks. Draft copies of the instruments were presented to three experts in Science Education, Guidance and Counseling, and Test Measurement and Evaluation. Their suggestions and corrections were used to refine the test items and questionnaire to ensure clarity, relevance, and alignment with the study objectives.

Reliability of the Instrument

The reliability of the instruments was determined through pilot testing. The Integrated Science Attitudinal Scale (ISAS), internal consistency reliability was determined using Cronbach's Alpha. The instrument was administered once during the pilot study, and the responses were subjected to reliability analysis. A Cronbach's Alpha coefficient of 0.86 was obtained, indicating a high level of internal consistency and confirming that the ISAS reliably measured students' attitudes towards Integrated Science.

Reliability of the Instrument

The reliability of the instrument was determined through pilot testing. The Integrated Science Attitudinal Scale (ISAS) was administered to a group of students with similar characteristics to the study sample, but who were not part of the main study. The test- retest method was used to establish its stability over time, and a reliability coefficient of 0.82 was obtained, confirming its consistency in measuring students' attitude towards learning of Integrated Science.

Experimental Procedure

The experimental procedure for this study was carried out over a period of six weeks and involved three main stages: pre-treatment, treatment, and post-treatment. Research assistants were engaged throughout the study to help administer tests, monitor the treatment, and ensure adherence to the experimental protocol.

Pre- Treatment Stage: At this stage, the instrument was administered as pre-test to determine their baseline attitude in the Matter and Energy 1 (SED 224) course. Research assistants helped in distributing and collecting the questionnaire, as well as clarifying instructions to ensure uniform understanding among the sample.

Treatment Stage: During the treatment stage, the experimental group was exposed to the WhatsApp Learning Platform. The platform was used to deliver lectures, share notes, assignments, and facilitate discussions for a specified period, while the control group continued with the conventional face-to-face instructional method. Research assistants supported the experimental group by monitoring activity on WhatsApp, reminding students of assignments, and providing technical guidance when needed. The treatment lasted for six weeks.

Post- Treatment Stage: At the conclusion of the treatment, both the experimental and control groups were administered the ISAT again to assess any differences in their attitude towards leaning of Integrated Science. Research assistants assisted in administering the questionnaire and ensuring proper completion.

Data Analysis

The data collected analyzed using descriptive and inferential statistics. The research question was answered using descriptive statistics of mean and standard deviation. Hypotheses 1-2 were tested using t-test analysis. The two hypotheses were tested at 0.05 level of significant.

RESULTS

Descriptive Analysis

Research Question 1:

What is the attitude of undergraduates towards learning of Integrated Science before and after exposure to Whatsapp learning platform and conventional method?

Table 1: Means and Standard Deviation of Attitude of students towards learning of Integrated Science before and after treatment

Group	N	Mean (Before)	SD (Before)	Mean (After)	SD (After)	Mean Difference
Whatsapp Learning Platform	108	58.40	7.80	74.20	6.30	15.80
Conventional Method	92	57.90	8.10	68.50	7.50	10.60

Table 1 reveals that undergraduate students exposed to both the WhatsApp Learning Platform and the Conventional Method developed a more positive attitude towards learning of integrated Science after the treatment. For the WhatsApp Learning Platform group, the mean attitude score increase from 58.40 (SD = 7.80) before treatment to 74.20 (SD = 6.30) after treatment, indicating a mean gain of 15.80. In comparison, the Conventional Method group improved from a mean score of 57.90 (SD = 8.10) before treatment to 68.50 (SD = 7.50) after treatment, with a mean gain of 10.60. Although both methods enhanced students' attitude towards learning of Integrated Science, the WhatsApp Learning Platform yielded a higher mean improvement, suggesting greater effectiveness in boosting learning attitude towards Integrated Science.

Testing of Hypotheses

Hypothesis 1

There is no significant difference in the attitude of undergraduates in the experimental and control groups before exposure to treatment in Integrated Science.

Table 2: t-test analysis of the difference in the Attitude of undergraduates in the experimental and control groups before exposure to treatment in Integrated Science

Group	N	Mean	SD	df	T	p
Whatsapp Learning Platform	108	58.40	7.80	198	0.44	0.66
Conventional Method	92	57.90	8.10			

$p > 0.05$ (Not Significant)

Table 2 shows that before treatment, the Whatsapp Learning Platform group had a mean attitude score of 58.40 (SD = 7.80), while the conventional method group had a mean attitude score of 57.90 (SD= 8.10). The t-test result ($t = 0.44$, $df = 198$, $p = 0.66$). This indicates that the differences between the two groups was not statistically significant ($p > 0.05$). This means that both groups were comparable in their attitude towards learning of Integrated Science at the pre-test stage, supporting the null hypothesis that there is no significant difference in the attitude of undergraduates towards leaning of Integrated Science in the experimental and control groups before exposure to treatment.

Hypothesis 2

There is no significant difference in the attitude of undergraduates taught using the WhatsApp Learning Platform and those taught using the Conventional Method in Integrated Science

Table 3: t-test analysis of the difference in the attitude of undergraduates taught using the WhatsApp Learning Platform and those taught using the Conventional Method in Integrated Science.

Group	N	Mean	SD	df	t	P
Whatsapp Learning Platform	108	74.20	6.30	198	5.70	0.001
Conventional Method	92	68.50	7.50			

$P < 0.05$ (Significant)

Table 3 shows that after treatment, the Whatsapp Learning Platform group had a mean attitude score of 74.20 (SD = 6.30), while the conventional method group had a mean of 68.50 (SD= 7.50). The t-test result ($t = 5.70$, $df = 198$, $p = 0.001$). This indicates that the differences in attitude between the two groups was statistically significant ($p < 0.05$). Hence, the hypothesis was rejected. This means that undergraduates taught using the WhatsApp Learning Platform a significantly more positive attitude towards learning of Integrated Science than those taught using the Conventional Method.

DISCUSSION

The study revealed that undergraduates' attitude towards learning of Integrated Science improved under both the WhatsApp Learning Platform and the Conventional Method, with a markedly greater enhancement in the WhatsApp group, a result consistent with Adewale and Oladipo (2023) and corroborated by (Nwagbo, 2016), who found that WhatsApp's interactive and flexible nature enhances students' attitude. Both groups also developed more positive attitudes toward Integrated Science, with a stronger shift in the WhatsApp cohort, in

line with Ojo and Fadipe (2023) and in consonant with Nwagbo, (2016), who linked mobile-assisted learning to improved motivation, though Onwuka (2021) warned of blurred academic-social boundaries.

The finding of the study revealed that there was no significant difference in attitude towards Integrated Science between the two groups before treatment, showing similar initial attitudes. This is consistent with Adeyemi (2022) and corroborated by Nwagbo, (2016), who noted that establishing equivalence in pre-intervention attitudes enhances the credibility of subsequent comparisons. The similarity in initial attitudes could be attributed to shared socio-cultural backgrounds, comparable prior learning experiences, and exposure to similar instructional methods, which may have shaped students' perceptions of Integrated Science in a uniform manner. In contrast, Oladipo (2020) observed that attitude differences at baseline can emerge in more diverse populations, suggesting that the homogeneity in this study may reflect the relatively uniform academic and social context of the participants. The implication of this finding is that it strengthens the internal validity of the research, ensuring that any post-treatment differences in attitudes can be more confidently attributed to the teaching method particularly the use of the WhatsApp Learning Platform rather than to pre-existing predispositions.

CONCLUSION

The study concluded that the use of the WhatsApp Learning Platform (WLP) significantly fostered more positive attitudes toward learning of Integrated Science compared to the Conventional Method.

Recommendations

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

1. Lecturers should consider incorporating the WhatsApp Learning Platform as a supplementary tool in teaching Integrated Science to enhance students' positive attitudes toward the subject.
2. Universities should provide training for lecturers on the effective use of digital platforms like WhatsApp to improve instructional delivery and student learning outcomes.
3. Educational planners and curriculum developers should explore ways to integrate mobile learning strategies into Integrated Science courses to complement conventional teaching methods.
4. Students should be encouraged to actively participate in online learning platforms to maximize collaborative learning, knowledge sharing, and peer support.
5. Future studies could investigate the long-term effects of WhatsApp-based learning on attitude across other courses and explore its impact in different attitudinal levels and settings.

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