# Relationship between Sciences and Education Lecturers' Perceived Use of Mobile Technologies for Instruction

Taye Rasheed Rasheed Alani[1], Omotayo Olabo Obielodan[1], Amos Ochayi Onojah[1], Aderele Shadrack Omotayo[2], Adenike Aderogba Onojah[1], Ndaceko Joel Alasan[1]

[1] University of Ilorin, Ilorin, Nigeria
[2] Adeyemi College of Education, Ondo, Nigeria

*e-mail: haymoresonojah@yahoo.com

## Abstract

Mobile technologies enable both education and science lecturers to provide the educational materials to their students on mobile technologies. But many science and education lectures educators were likely not using mobile technology to its maximum potential. The objectives were to examine the relationship between science and education lecturers and the effect of specialisation in the use of mobile technologies for instruction. The study was a descriptive research of survey type. 160 respondents were randomly selected for this study from the faculty of science and education. Frequency, percentage, multiple regression, and ANOVA were used for the analysis. The findings established that a positive relationship exists between science and education lecturers in the use of mobile technologies for instruction. It was recommended that lecturers should be encouraged to explore different ways in which mobile technologies can be used in teaching and learning.

## 1. Introduction

Education can be seen as a process of providing knowledge and experiences that are worthwhile to the child to develop his power to be able to achieve maximum possibilities in his society. Education in the largest sense is any act or experience that has a formative effect on the mind, character, or physical ability of an individual. In its technical sense, education is the process by which society deliberately transmits its accumulated knowledge, skills, and values from one generation to another. Education, in the narrower sense, is regarded as equivalent to instruction. It consists of the "specific influences" consciously designed in a school or in a college or in an institution to bring in the development and growth of the child. Education seeks to develop the innate or the inner potentialities of humans (Thomas, 2010). Technology is the practical application of knowledge and skills to create solutions to satisfy our needs or solve problem. It is the use of the product of creativity, inventions, and scientific research. Nature has given man many natural resources and the ability to effectively utilize the material depends greatly on the man's mastery of technology. Technology plays a vital role in wealth creation, improvement of the quality of life, and transformation in any society. It also has the power to transform the way we collect, store and process information to satisfy our needs. Technology as people said is the bedrock of any nation, a nation without technology will find it difficult to develop and experience positive change among its citizens.

In both industrialized and developing nations, the use of information and communication technologies in academic research has risen steadily, altering all aspects of study. The means used to acquire information and the computing power available in data processing electronically have made conducting difficult computations for research less burdensome. As a result, digital libraries provide everyone with equitable access to instructional resources, enhancing research opportunities all around the world through the use of digital mobile technology [1] By expanding on existing means of accessing information, mobile technologies promote the development of new types of knowledge, therefore challenging face-to-face and formal education [2] through electronic access, processing, and distribution of research findings (Nathaniel, 2020). Access to information, particularly electronic resources for instruction, is critical to the success of university education across the world.

Mobile technologies have become within short time, one of the basic building blocks of modern society. Many countries now regard understanding mobile technology and mastering the basic skills and concept of ICT as part of the core curriculum alongside reading, writing and numeracy because of the fundamental importance of information technology in the task of school today (Hennessy, 2015). Since the start of this millennium, a standard mobile device has gone from being no more than a simple two-way pager to being a mobile phone, GPS navigation device, an embedded web browser and instant messaging client, and a handheld game console. Many experts argue that the future of computer technology rests in mobile computing with wireless networking. Mobile computing by way of tablet computers is becoming more popular. The most popular tablet now is the iPad, by Apple (Ertmer, 2010). Some responses suggested that using a mobile phone as a teaching aid has several advantages in the educational process, including increasing individual participation in the teaching-learning process, usefulness as a supplementary teaching aid, facilitating the management and planning of the teaching process, and students' perception of mobile applications as a necessary prerequisite. According to the quantitative data, the participants' mean score in terms of ease of use and self-efficacy increased above the average level, but the dimension of usefulness stayed at the average level. These factors demonstrate the advantages of using a mobile phone, and the qualitative findings (derived from the participants' actual experiences) corroborate these findings (Mohammadi, Sarvestani & Nouroozi, 2020).

Technology is advancing at a breakneck pace in many sectors of modern society, including education. In keeping with this trend, information and communication technology is increasingly being used in educational activities as a teaching and learning aid (Matimbwa&Anney, 2016). Mobile learning has also developed as a new technology advancement and educational trend that gives many options for both educators and students (Ilci, 2014). The potential for successful teaching and learning is expanding with the usage of mobile technology (Sanga et al.,2016). This is owing to the advantages of mobile learning, which include the ability to exchange information without regard to place or time constraints, as well as the ability to encourage the development of critical thinking, participatory learning, problem solving, and lifelong communication skills (Abidin & Tho, 2018). Technologies if effectively implemented into the instructional processes could facilitate teaching, communication and other instructional means. The characteristics of mobile technologies that support both individual and social aspects of learning must be advanced, and educational institutions at the secondary and post-secondary levels must continue to explore emerging technologies in order to increase student engagement and, as a result, improve retention and graduation rates (Campbell, 2022). Despite its enormous promise and the inventive development of mobile technology, mobile learning is still in its infancy in many aspects.

Science lecturer must have practical knowledge of child psychology and of the process of learning. The science lecturer should be able to eater to individual differences in the class. Knowledge of child psychology helps a lecturer to guide the students according to their

interests, capabilities and help in educational, vocational, and personal problems. Besides these, a science lecturer should be of a scientific temper, rational in approach to problems, free of bias and superstitions, innovative, inquisitive about the world around him. A Science lecturer should regularly evaluate his teaching so that he can keep improving and help him identify his weakness (Crompton, 2018). Education lecturers are educators, experts who employ innovations in teaching and learning, to meet the learning needs of students, through the development of teaching materials, forms of pedagogy, or appropriate teaching collaborations. Education lecturers provide field experiences that are more purposeful and more directly focused on teaching preservice teachers about teaching as opposed to simply providing a classroom for preservice teachers to practice teaching. They are more likely to invest time in engaging in an in-depth mentor–student relationship and be "agents of change (Darling-Hammond & Hammerness, 2015). Plenty of mobile features such as GPS, file storage, cameras, video recorder and browsing, made academicians see mobile phone technologies important tool when it comes to managing the teaching tasks (Nassuora, 2013). As the population of campuses expands, so does the improvement of mobile technologies, Higher Education Institutions utilize mobile technologies with interesting features like camera, video, GPS, memory, MP3 player, by allowing studying and collaboration anytime anywhere (Maniar 2008).

According to Al-Shehri (2020), in order for Vision2030 to be implemented successfully and improve education, there must be I the incorporation of technology that students are familiar with, as well as the use of social media to provide real-life scenarios; (ii) effective, open-minded teacher training; (iii) an understanding that change and modernisation do not have to undermine national identity; and (iv) improved communication with teachers. Despite the fact that mobile technology does not appear to be mentioned specifically in the Vision2030 initiative program, it successfully calls for a shift in teaching attitudes and techniques that would benefit from the use of mobile technology's advantages. At all levels, education is gender-segregated, with no interaction between male and female pupils (Almofadi, 2022. Computer and mobile technologies are continually evolving in order to be used in the classroom.

El-Hussein and Cronje (2010) opined that the perceived use of mobile technologies for learning can enlarge the scope of tertiary education and allow it to better reach students. The use of these technologies for learning is equally capable of providing a more interactive and effective type of learning to meet individuals' learners needs. Mobile technology can be beneficial for higher education due to its ubiquitous nature and ability to shape information processes (Schepman & Lambert, 2012). Mobile technologies are used by the lecturers in playing pre-recorded lectures, recording lectures, accessing class news bulletins, students listening to podcasts and digital audio books as well as watching educational videos. If used, these technologies enable both education and science lecturers to provide the educational materials (in text, audio, and video formats) to their students on a mobile technology (Yuen, 2018). More attention is to be paid to the more obvious reality that the usefulness of this emerging technology can remain in the deep shadows if the lecturers who are supposedly meant to make use of it to facilitate their students are not either aware of its effectiveness, refrain for the use of it due to cultural beliefs or orientations or do not see it as a tool for learning rather a tool for just entertainment. Hence, the research fills the gap by investigating the Relationship between science and education lecturers' perceived use of Mobile technologies for instruction in university of Ilorin

The main objective of the study is to investigate the Relationship between science and education lecturers' perceived use of Mobile technologies for instruction in university of Ilorin. Specifically, the study (1) examined the relationship between science and education lecturers in the use of mobile technologies for instruction; (2) investigated the influence of areas of specialization on lecturers' perceived use of mobile technologies for instruction.

The following research questions were raised to guide this study: (1) What is the relationship between science and education lecturers in the use of mobile technologies for instruction? (2) What is the influence of areas of specialization on lecturers' perceived use of mobile technologies for instruction?

The following null hypotheses was tested: Ho1: there is no significant relationship between science lecturers and education lecturers perceived use of Mobile technologies for instruction. Ho2: There is no significant difference between lecturers perceived use of mobile technology for instruction based on area of specialization.

## 2. Method

The study is a descriptive research of the survey type. Survey is chosen for this study because it enabled the researcher to collect information about Relationship between science and education lecturers perceived use of mobile technologies for instruction. A researcher designed Questionnaires were used to collect information.

The populations for the study were lecturers in the University of Ilorin, Ilorin, Nigeria. The target populations for this study were based on Education and Science lecturers in university of Ilorin, kwara state, Nigeria. The sample were purposely drawn from university of Ilorin lecturers on the premise that they make use of mobile technologies for teaching and learning. Faculty of Science is two hundred and five (205), faculty of Education is two hundred and six (206). When doing research, the quantity and selection of individuals or observations may be used to define quality sampling. For a variety of reasons, obtaining a sample size that is acceptable in both respects is crucial. A high sample size is also more typical of the population, reducing the impact of outliers or extreme data. A sufficiently high sample size is also required to yield meaningfully different findings among variables. An undersized research can be a waste of resources since it lacks the capacity to deliver valuable results, whereas an oversized study consumes more resources than is required. When a pilot research is not possible, the number that optimizes sample size (50 percent for a fixed amount of sampling error) can be chosen (Martnez-Mesa, et al., 2014). The total population in both faculties is four hundred and eleven (411). 50% of entire population in the entire lecturer in the two faculty were purposely sampled.

A researcher designed questionnaires titled "Relationship between science and education lecturers perceived use of mobile technologies for instruction in university of Ilorin, Nigeria. The questionnaire consisted of twenty (20) questions and adapted attitudinal scale with reference option of F. U= frequently used, S.U= Sometimes used, SA=Strongly Agree, A=Agree, SD= Strongly Disagree, D=Disagree. Response to each statement was identified by ticking the appropriate column assigned to the statement.

The research instruments were validated by three (3) lecturers in the department of Educational Technology in the department of Educational Technology for face and content validity. All necessary corrections, amendments, modification, and suggestions were made before and administration of the instrument. The questionnaires were distributed to the respondents in the selected faculty and be administered by the respondents. It was collected immediately after they have been adequately completed.

The data obtained through the questionnaires were subjected to descriptive and inferential statistics. Frequency count and percentage were used to answer the research question while multiple regression was employed to answer research hypothesis.This section describes how the research was conducted, research design, data collection techniques, instrument development, and data analysis techniques.

## 3. Results and Discussion

A total of 206 education and science lecturers from University of Ilorin, Kwara State comprising of 86 sciences lecturers and 74 education lecturers made up the sample for this study. The 206 respondents were given the research instrument with the items, and eventually but 160 were available and responses from the 160 lecturers were properly filled and returned amounting to 77.7% response rate. The respondents' demographic data are presented in Table 1.

**Table 1**

Respondents Demographic based on Faculty

| Area of Specialisation | Frequency | Percent | Cumulative Percent |
|---|---|---|---|
| Sciences | 86 | 53.8 | 53.8 |
| Education | 74 | 46.2 | 100.0 |
| **Total** | **160** | **100.0** | |

The respondents' faculties were as revealed in table 1. It indicated that 86 respondents were sampled from the faculty of science while 74(46.2%) of the lecturers were sampled from the faculty of Education and employed in this study.
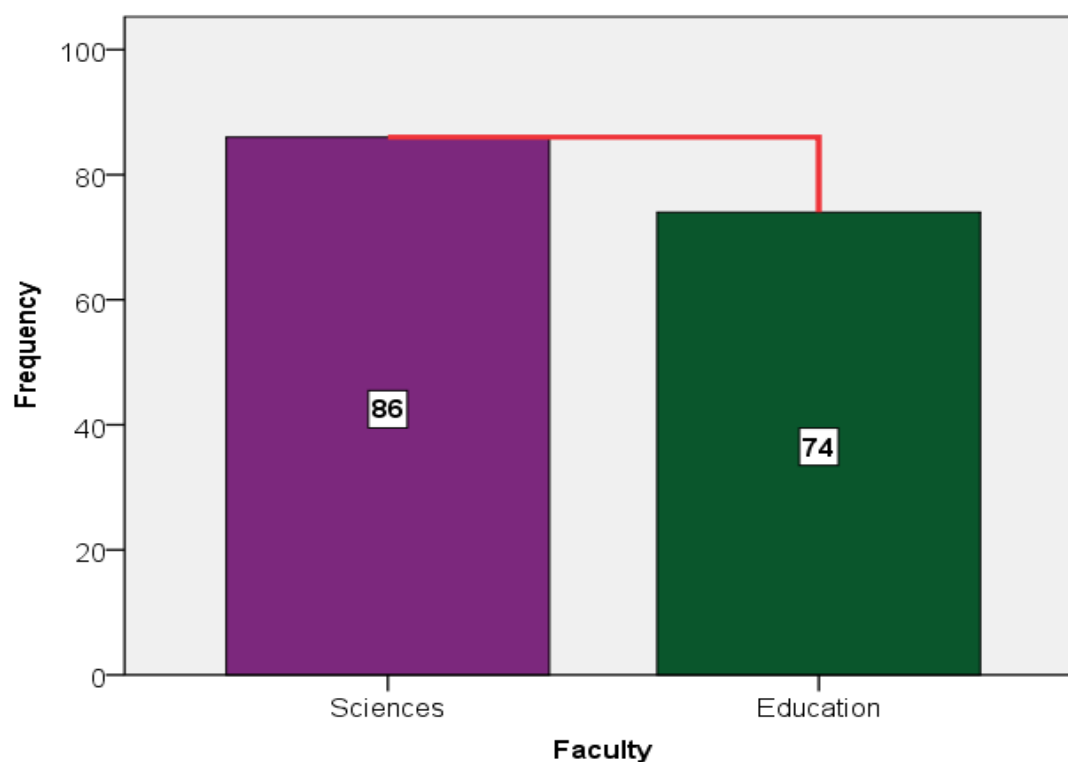


**Figure 1. Chart on Respondents' Faculties**

The chart in figure 1 display the portion which each of the faculties sampled in this study represents.

**Research Question One**

What is the relationship between science and education lecturers in the use of mobile technologies for instruction?

**Hypothesis One**

There is no significant relationship between science lecturers and education lecturers' perceived use of mobile technologies for instruction

In other to ascertain the significance relationship between science lecturers and education lecturers' perceived use of mobile technologies for instruction, regression statistical tool was employed.

**Table 2.**
Model Summary on Regression of the Variables

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .189a | .036 | .030 | .31003 | .036 | 5.858 | 1 | 158 | .017 |

a. Predictors: (Constant), Faculty

From the results in table 2, the adjusted R square (.030) has good fit. This revealed that the constructed multiple regression model of the independent variable of faculty account for 30% variance in the dependent variable (perceived usefulness). The results on the analysis of variance (ANOVA) for the model are as shown in table 3.

**Table 3.**
ANOVA on the Independent Variables of Perceived Usefulness

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .563 | 1 | .563 | 5.858 | .017b |
| | Residual | 15.187 | 158 | .096 | | |
| | Total | 15.750 | 159 | | | |

a. Dependent Variable: Perceived Usefulness
b. Predictors: (Constant), Faculty

The result on the analysis of variance (ANOVA) on independent variable of utilization was reviewed and presented in table 3. The result showed that F (1, 159) = 5.86, p<0.05. This indicated a statistically significant relationship since the p-value is less than 0.05. The result is as shown in table 4.

**Table 4.**
Coefficient of Independent Variables on Perceived Usefulness

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 3.215 | .076 | | 42.323 | .000 |
| | Faculty | .119 | .049 | .189 | 2.420 | .017 |

a. Dependent Variable: Perceived Usefulness

The standardized coefficient in table 4 revealed that the independent variable, faculty has strong positive influence on the perceived usefulness of mobile technologies for instruction because the Beta (*B*=0.19, 0.02) shows statistically relationship value was less than 0.05 alpha value.

**Research Question Two**

What is the influence of areas of specialization on lecturers' perceived use of mobile technologies for instruction?

**Hypothesis Two**
There is no significant difference between lecturers perceived use of mobile technology for instruction based on area of specialization.

Independent samples t-test was conducted to determine if there is any significant difference between lecturers perceived use of mobile technology for instruction area of specialization. The result is shown in Table 5.

**Table 5.**
T-test on Significant Difference Between Lecturers Perceived Use of Mobile Technology

| Faculty | N | Mean | Std. Deviation | Mean Gain | Df | T | Sig.(2-tailed) |
|---------|-----|--------|---------|------|-----|--------|-------|
| Sciences | 86 | 3.3337 | .30219 | | | | |
| | | | | 0.12 | 158 | -2.420 | 0.017 |
| Education | *74* | 3.4527 | .31891 | | | | |
| Total | 160 | | | | | | |

Table 5 indicates that t (158) = 2.42, p = 0.02. This means that the stated null hypothesis was rejected. This was as a result of the t-value of 2.40 resulting in .02 significance value which was less than 0.05 alpha value. By implication, the stated null hypothesis was established thus: There was significant difference between lecturers perceived use of mobile technology for instruction based on area of specialization. In other words, based on the mean score of lecturers perceived use of mobile technology for instruction based on area of specialization in Table 5 the perceived use of mobile technologies by education lecturers was more effective than their science counterparts.

Hence, the following are implications of the study, The study aids the researcher to understand lecturers' perceived usefulness of mobile technology for teaching which enables them to accomplish their lecturing task more quickly; The study exposes the researcher to the perceived ease of use of mobile technology for teaching which is a major determinant in implementing the usage. There exist positive relationship between science and education lecturers in their perceived use of mobile technology for instruction. Educators perceived the use of mobile technologies to enhance teaching are paramount to the success of implementing mobile technological innovation in education (Marinakou & Giousmpasoglou, 2016). Some educators regard the use of mobile technology by learners at school as a deterrent to learning while others regard it as a tool for effective learning. Prensky (2015) contends that today's learners are digital natives with the motivation to learn differently compared with learners of the 20th century. Researchers such as Barker, Krull and Mallinson (2015) agreed that mobile learning is a vehicle to cross the digital divide. Learners and educators need to be positively inclined to use cell phones with internet services fruitfully.

The study of Nathaniel (2020) discovered that university lecturers faced challenges such as the cost of using mobile network service providers, a lack of institutional support, power outages, unstable networks, limited battery life, lecturers requiring additional training in order to effectively use the device, and other issues related to maximizing the judicious use of mobile technologies for research collaboration. However, given Nigerian lecturers' eagerness to

cooperate and publish in peer-reviewed journals, it is necessary to seek out quicker, simpler, and faster methods through the use of digital mobile technologies, which university lecturers confront certain hurdles, as revealed in this study. This emphasizes the need of ensuring that instructors accept and embrace the usage of such tools and mobile devices if they are to be properly integrated into their teaching practices. When it comes to mobile devices in language classes, instructors should view them as a beneficial tool rather than a threat to their function. According to the communicative approach, language is learnt as it is utilized in engagement and communication activities (Almofadi, 2022). Using mobile devices to enhance educational activities implies offering a tool and an endless stream of materials, while the instructor serves as a guide and facilitator. During class activities, teachers might show how to utilize mobile devices. Obviously, instructors should think about how mobile devices may be used in the classroom (Godwin-Jones, 2017)

Furthermore, the study established that there is no significant difference between lecturers perceived use of mobile technology for instruction based on area of specialization in fvour of the education lecturers. The digital revolution is transforming education by using information and communication technologies (ICTs) to improve students' learning outcomes (Criollo, et al. 2021). Vavoula et al., (2017) affirms that students in higher education institutions when engaged in real-world activities that can represent the abstract concepts they are learning about, it can present a means of modifying and simplifying learning for them. This is especially crucial for science learning, in the sense that it involves increasing knowledge about complicated abstract concepts, which in turn can be more significant if students are able to build a relationship between their formal knowledge and their personal experiences. Technology can make students hopeful in reflecting their learning and considering its relation to the world around them (Waycott & Kennedy, 2019). This is especially crucial for science learning, in the sense that mobile phone technologies can also assist science students to construct a connection between learning science in the classroom and their personal experiences in the outside world (Twum, 2017). Mobile learning is collaborative 21st-century learning that is defined by constructivist learning. It establishes a foundation for ubiquitous learning access to learning at any time and from any location (Campbell, 2022). With the implementation of good instructional design, a guiding theoretical framework will aid in increased integration of mobile learning apps in teaching and learning, to the advantage of both students and instructors.

## 4. Conclusion and Recommendations

From the result of this research, it was concluded that sciences and education lecturers perceived the use of mobile technologies as a useful tool in teaching and learning with great potential in both classrooms and outdoor learning. Since it has been found that both sciences and education lecturer perceived the use of mobile technology as a useful tool, but nonetheless the following recommendations are being made. The government should provide an affordable platform for lecturers and students to have their personal technological devices (computer set) which they can use independently and for group learning (virtual learning). Also, lecturers should endeavor to actively carry the students along to supplement their teaching and increase productivity.

For further studies in this area, the following were suggested. Effort to replicate this study in other universities in Nigeria is suggested. Also, the relationship between lecturers' perceived use of Mobile technologies for instruction in university of Ilorin based on other faculties is suggested for further studies. Moreover, further studies can be carried on lectures perceived use of other innovative technologies for instructional activities in tertiary institutions in Nigeria and other countries.

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