*Trop. J. of Eng., Sci. and Techn. 2022. 1(1):109-121*
*@Tropical Journal of Engineering, Science and Technology.*

# High Access and Low Use of Smart Phones in Secondary School Classrooms: Determinants of Educational Technology Adoption in Secondary Agriscience among Teachers in Lagos State

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## Abstract

*It is estimated that about forty—four percent of Nigerians have access to smartphones. Increasing ownership of smartphones as against ordinary phones in Nigeria should translate to technology-driven pedagogy and positive classroom experience. This paper investigates smartphone availability, usage and adoption for educational purposes by agricultural science teachers in Lagos State and isolates factors influencing technology adoption of these teachers. A well-structured questionnaire, which comprised 18 items and divided into three sections was used to elicit information on availability and openness to technology adoption and other selected characteristics of agricultural science teachers in the study area. A total of 120 questionnaires were administered to participants who were purposively sampled from the Education District VI of Lagos State. All the questionnaires were properly completed and used for the analysis. Percentages, frequencies, mean and standard deviation and Logit regression model were employed for the analysis. Result showed that the mean age of participants was 45.11 while the standard deviation was ±10.31. Majority of the agricultural science teachers were male (60%), married (71%), teaching in public schools (61%), and with averagely large family sizes (4) and high levels of education. Estimates of the regression analysis clearly show that marital status, level of education, family size, access to electricity, teaching in private schools, and technology anxiety were the determinants of technology integration into teaching and learning. It was recommended among others that the teachers should engage in high-quality professional development before a change in classroom practice can take place.*

**Key Words:** Smartphone, Educational Technology, Secondary school, Agricultural science, Teachers

# Accès élevé et faible utilisation des smartphones dans les salles de classe du secondaire : déterminants de l'adoption de la technologie éducative dans l'agroscience secondaire parmi les enseignants de l'État de Lagos

## Résumé

On estime qu'environ quarante-quatre pour cent des Nigérians ont accès aux smartphones. L'augmentation de la possession de smartphones par rapport aux téléphones ordinaires au

Nigeria devrait se traduire par une pédagogie axée sur la technologie et une expérience positive en classe. Cet article étudie la disponibilité, l'utilisation et l'adoption des smartphones à des fins éducatives par les enseignants de sciences agricoles dans l'État de Lagos et isole les facteurs influençant l'adoption de la technologie par ces enseignants. Un questionnaire bien structuré, composé de 18 éléments et divisé en trois sections, a été utilisé pour obtenir des informations sur la disponibilité et l'ouverture à l'adoption de la technologie et d'autres caractéristiques sélectionnées des enseignants en sciences agricoles dans la zone d'étude. Au total, 120 questionnaires ont été administrés à des participants sélectionnés à dessein dans le district éducatif VI de l'État de Lagos. Tous les questionnaires ont été correctement remplis et utilisés pour l'analyse. Les pourcentages, les fréquences, la moyenne et l'écart type et le modèle de régression de Logit ont été utilisés pour l'analyse. Le résultat a montré que l'âge moyen des participants était de 45,11 ans tandis que l'écart type était de ± 10,31. La majorité des professeurs de sciences agricoles étaient des hommes (60%), mariés (71%), enseignant dans des écoles publiques (61%), et avec des familles de taille moyenne (4) et des niveaux d'éducation élevés. Les estimations de l'analyse de régression montrent clairement que l'état matrimonial, le niveau d'éducation, la taille de la famille, l'accès à l'électricité, l'enseignement dans les écoles privées et l'anxiété liée à la technologie étaient les déterminants de l'intégration de la technologie dans l'enseignement et l'apprentissage. Il a été recommandé, entre autres, que les enseignants s'engagent dans un développement professionnel de haute qualité avant qu'un changement dans la pratique en classe puisse avoir lieu.

**Mots clés** : Smartphone, Technologie éducative, École secondaire, Sciences agricoles, Enseignants

:الـ ثانـويـة الـمدارس فـ صـول فـ ي الـ ذكـ ية لـ لهواتـ ف الـ مـ نخـ فض والا سـ تخدام الـمرتـ فع الـ وـ صول ولايـ ة فـ ي الـ مـ عـ لـمـ ين بـ ـين الـ ثانـويـة الـ زراعـ ية الـ عـ لوم فـ ي الـ تـ عـ لـ يـم تـ كـ نولـ وجـ يا اعـ تماد محددات لاغوس

الـ مـ لخص

إمكانـ ية لـ ديـ هم الـ نـ يجـ يريـ ين من بـ الـمائـة وأربـ عـ ين أربـ عـ ة حوالـ ي أن إلـ ى الـ تـ قديـ رات تـ شـ ير بـ الـهواتـ ف مـ قارنـة الـ ذكـ ية الـهواتـ ف مـ لكـ ية زيـ ادة تُترجم أن يـ جب .الـ ذكـ ية الـهواتـ ف إلـ ى الـ وـ صول صـ فـ ية وتـ جربـ ة الـ تـ كـ نولـ وجـ يا عـ لـى تـ عـ تمد تـ عـ لـ يـم ية أصول إلـ ى نـ يجـ يريـ ا فـ ي الـ عاديـ ة لـ لأغراض واعـ تمادها واسـ تخدامها الـ ذكـ ية الـهواتـ ف تـ وفـ ر مدى فـ ي الـ ورقـ ة هذه تـ بحث .إيـ جابـ ية تـ ؤثـ ر الـ تـ ي الـ عوامل وتـ عزل لاغوس ولايـ ة فـ ي الـ زراعـ ية الـ عـ لوم معـ لمي قـ بل من الـ تـ عـ لـ يـم ية والـ ذي ، جـ يد بـ شكل منظم اسـ تـ بـ يان اسـ تخدام تـ م .الـ معـ لمـ ين لـ هؤلاء الـ تـ كـ نولـ وجـ يا تـ بـ ني عـ لـى والاـ ف تاح الـ توافـ ر حول الـ معـ لومات لا سـ تـ ناط أقـ سام ثـ لاثـ ة إلـ ى ومـ قسمة فـ قرة 18 من يـ تكون منطـ قة فـ ي الـ زراعـ ية الـ عـ لوم لـ معـ لمي الـ مخـ تارة الـ خـ صائـ ص من وغـ يرها الـ تـ كـ نولـ وجـ يا تـ بـ ني عـ لـى من قـ صد عن منهم عـ ينات أخذ تـ م الـ ذيـ ن لـ لمـ شاركـ ين استبيانًا 120 مجموعه ما إجراء تـ م .الـ دراسة واسـ تخدامها الاـ سـ تـ بـ يانات جمـ يع ملء تـ م .لاغوس ولايـ ة فـ ي الـ سادسة الـ تـ عـ لـ يـم ية الـ منطـ قة

والمتوسط والتكرارات المئوية النسبة استخدام تم .التحليل في صحيح بشكل عمر متوسط أن النتائج .لتحليل المنطقي الانحدار ونموذج المعياري والانحراف العلوم معلمي غالبية .10.31 ± المعياري الانحراف كان بينما 45.11 كان المشاركين الحكومية المدارس في بالتدريس قومون ، (71%) متزوجين ، (60٪) الذكور من هم الزراعية تحليل تقديرات تظهر .عالية تعليمية ومستويات (4) كبير عائلي حجم ومتوسط ، (61٪) على والحصول ، الأسرة وحجم ، التعليم ومستوى ، الاجتماعية الحالة أن بوضوح الانحدار لدمج المحددة العوامل كانت التكنولوجي والقلق ، الخاصة المدارس في والتدريس ، الكهرباء المعلمين على بأن أخرى أمور بين من التوصية تمت .والتعلم التدريس في التكنولوجيا .الصفية الممارسة في تغيير يحدث أن قبل الجودة عالي مهني تطوير في المشاركة

العلوم ، الثانوية المدرسة ، التعليم تكنولوجيا ، الذكي الهاتف :المفتاحية الكلمات المعلمون ، الزراعية

## Introduction

Technology is often emphasized as being a critical component of both educational reform
and classroom innovation. The major headway private schools have over public schools in Nigeria is through technology availability and adoption. In modern classrooms, computers are commonplace, with 98% of schools having one or more in the classroom and 84% having high-speed Internet connections (Statisticbrain, 2015). While the availability of technology is ever-increasing, individual teachers may not integrate at the same rate. Many factors may contribute to a lack of technology integration. Specifically, issues such as (a) a lack of support, (b) a lack of technical access, (c) student issues, (d) technical problems, and (e) teacher attitude can all impact a teacher's willingness to integrate technology into the classroom (Smith, Stair, Blackburn and Easley, 2018; Olowa, 2012). Varieties of factors have been implicated as the main barriers to the adoption of educational technologies. Prominent are: (a) resources, (b) teachers' knowledge and skills and (c) teachers' attitudes and beliefs (d) the cost of technologies, (e) implementation issues, and (e) time needed to develop lessons to incorporate technology (Laskin and Avena, 2015; Olowa and Umoru, 2021).

Barriers to technology integration have been described as being hierarchical in nature;
first-order barriers include availability and teacher knowledge, while second-order barriers are defined as intrinsic factors such as teacher beliefs. While the availability of technology is critical to incorporation, a teacher's willingness to include technology within the classroom is often the determinant of a teacher's practice (Ertmer, 2005; Olowa and Umoru, 2021). A study conducted by Broekhuizen (2016) found 52.7% of teachers who have readily available access to technology showed no evidence of employing technology to allow students to gather, evaluate, or apply information toward learning. Further, only 36.7% of teachers implemented technology that allowed students to solve problems or create original works, and only 35.4% used technology for collaborative learning. Similarly, previous studies in agricultural education have found teachers most regularly use technology that is teacher-focused rather than student-focused. Studies have shown the most commonly utilised technologies by agricultural

education lecturers were interactive DVDs or CDs, digital cameras, video/CD/DVD players, laser disc players or standalone DVD or CD players, personal desktop computers, digital projectors, laptops, and cellular phones (Coley, *et al*, 2015; Olowa and Umoru, 2021).

With the rapid development of technology, some educators feel intimidated to incorporate applications they do not fully understand (Laskin and Avena, 2015). People born after 1980 are designated as digital natives because they have used technology their entire lives, while digital immigrants did not grow up immersed in technology (Laskin and Avena 2015). Digital native students drive the adoption of smartphones in higher education and are convinced that technology improved learning (Gikas and Grant, 2013). One exploratory study found that 60% of students believed mobile devices influenced their academic success positively (Gikas and Grant, 2013). However, not all students used their phones for learning (McCoy, 2013). Despite the popularity of smartphones, there are often restrictions on their use in secondary education because smartphones are often viewed as a classroom distraction, an opportunity for heinous behaviour, or simply a mode of entertainment (Laskin and Avena, 2015). This account for its frequent ban by school authorities.

However, O'Bannon and Thomas (2014) found teachers' attitude towards smartphones in the classroom has shifted. As a growing number of digital natives become classroom teachers, the willingness to incorporate smartphones for learning is on the rise. The goal of teachers should be to use students' passion for smartphones to improve learning (Laskin and Avena, 2015). Thomas and Muñoz (2016) conducted a study that identified which popular smartphone technologies were being most utilised by teachers and students. They reported basic applications such as accessing the internet, calculator, clock, and calendar were most often used within the classroom while only a very small portion of students used more advanced functions of their smartphones for developing 21st Century skills such as creating content, posting content online, or recording audio/video.

The use of advanced technology in agricultural education Programmes is related to the development of 21st Century skills (Ertmer and Otterbein-Leftwich, 2010). Several important studies have described how educational technology has been implemented into secondary agricultural education. A study in the United States of America (USA) that used 203 Louisiana agriculture teachers as sample found that teachers successfully employed basic technology such as email, but were not fully incorporating more advanced technology into their curriculum. Significant predictors of technology integration according to the study were (a) the teachers' belief in their teaching effectiveness, (b) computer anxiety, and (c) teachers' perceived barriers to technology integration (Williams, Warner, Flowers, and Croom, 2014).

The theoretical underpinning that guided this study was Roger's (2003) Diffusion of Innovations theory. The premise of the theory is that for the diffusion of a technology to occur, the potential adopters must perceive certain attributes of the innovation. These attributes include (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability (Rogers, 2003). Specifically, relative advantage refers to the perception of how much better the innovation is than the idea it will replace. Compatibility is

how well the innovation fits within the potential adopters' current situation, while complexity is the perception of the level of difficulty of the innovation. Trialability is the "degree to which an innovation may be experimented with on a limited basis". Finally, observability is how visible the results of the innovation are to others. Rogers (2003) noted that innovations that are perceived as low in complexity and high in the remaining categories are likely to be adopted at a more rapid rate than those perceived as complex. The general objective of this study is to describe the smartphone availability, usage and adoption by agriculture teachers in Lagos state for educational purposes and Isolate factors influencing technology adoption of these teachers. Specifically, the study seeks to:

1. Assess smartphone availability and openness to use them in teaching.
2. Identify educational technologies that agricultural educators incorporate into instruction.
3. Isolate factors that influence educational technology adoption in agricultural education.

## Methodology

The population for the study comprised all agricultural science teachers in Education District six of Lagos state. The district is divided into three zones namely, Ikeja, Mushin and Oshodi/Isolo. Forty Agricultural science teachers were purposively selected in each zone. Altogether, 120 Agricultural science teachers in both public and private schools within the district were purposively selected to form the sample for this study. A well-structured questionnaire which comprised 18 items divided into three sections was used to collect data. The first section focused on the selected characteristics of the participants and the school, which elicit information on gender, qualification, age, year of experience, religion, and marital status of agriculture teachers and certain facilities such as agricultural store, laboratory and electricity connection. The second session elicits information on the availability and openness to technology adoption as well as educational technologies utilized in teaching. The final section elicits information on the availability of smartphones and the openness to use them for teaching. An expert panel was constituted to review the instrument to help ensure its validity. The reliability of the items was established at Cronbach's Alpha ($\alpha$ =0 .81). The analytical techniques used for this study include simple descriptive statistics such as frequencies and percentages, mean, standard deviation, and inferential statistics (Logit Regression Model). While the frequency and percentages were used to describe the socio-demographics of the participants, Logit regression model was used to determine the predictors of technology integration. Logit regression model was employed because of the binary nature of the Dependent variable. Each administered copy of the well-structured questionnaire was examined and the responses from it were extracted for analysis. All the one hundred and twenty questionnaires that were properly completed were utilized in this study. To operationalize the logit model, the dependent variable was assigned the dummy status *1*, if they have smartphones and other educational technologies and deployed them in teaching. And *0*, otherwise. Teachers' characteristics of every observation for every characteristic were assigned *1* for non-negative response and *0*, for negative.

Participants who indicated neutrality were categorized with those who admitted the availability and utilization of smartphones and other educational technologies.

***Logit Regression Model***

Logit regression model was used to determine the factors influencing technology integration in teaching agricultural science. The Model is specified as follows:

LM is given as

$$LM = P_i = E(Y = 1/X1) = F(Z_i) = 1/(1+EZ) \quad \text{for } -\infty < Z_i < \infty \ldots\ldots\ldots(1)$$

$$Zi = \beta_i + \beta \sum kX_{ik} + \varepsilon \ldots\ldots\ldots\ldots(2)$$

Where:

$P_i$ = probability of agricultural science teachers' use of technology in teaching; it ranges from 0 to 1, and is non-linearly related to $Z_i$ (Y= use or otherwise of educational technologies)

$\beta i$ = constant term / intercept

$\beta_k$ = coefficients of regressors

$X_{ik}$ = K= 1, 2 …n = independent variables (with *ith* observation)

$X_1$ = sex (Male=1, 0, otherwise)

$X_2$ = age (years)

$X_3$ = marital Status (Married=1, 0, otherwise)

$X_4$ = religion (Christianity=1, 0, otherwise)

$X_5$ = level of education (years)

$X_6$ = Family size (number)

$X_7$ = Has Agric Laboratory (Yes=1, 0, otherwise)

$X_8$ = Has Electricity (Yes=1, 0, otherwise)

$X_9$ = Has WiFi (yes=1, 0, otherwise)

$X_{10}$ = Teaching in Private school (Yes=1, 0, otherwise)

X11= Technology Anxiety (Yes=1, 0, otherwise)

ε = error term with zero mean

As $Z_i$ ranges from -∞ to ∞, $P_i$ ranges from 0 to 1

In estimable form,

$$LM = Ln\left(P_i/1-P_i\right) = Z_i = \beta_i + \beta \sum kX_{ik} + \varepsilon \ldots\ldots(3)$$

Where:

$Ln\left(P_i/1-P_i\right)$ = log odd ratio, showing how log odds change as respective independent variable changes by 1 unit. This analysis adopt maximum likelihood estimation technique.

## Results and Discussion

*Summary of Selected Characteristics of Agricultural Science Teachers and School*

The summary of the selected characteristics of respondents is presented in Table 1. The mean age of participants was 45.11 while the standard deviation was 10.31. Majority of the respondents (86%) were married and their average family size was 4 with standard deviation being 3.22, indicating a fairly large household. When disaggregated on a gender basis, male respondents were more (60%) than female (40%). On average, respondents have about 16 years of education with standard deviation of 10.03 years. As shown in the table, Christianity is the dominant religion (57%) among sampled respondents. With reference to the school sector of respondents, the majority of respondents (61%) were engaged with

public schools as agricultural science teachers while 39% were in the employ of private schools. The study also sought to know the level of availability of certain technology-enabling facilities such as Wi-Fi, electricity and laboratory for agricultural science, which could engender educational technology adoption. Majority (65%) of the schools had no electricity connection to their schools; 21% had agricultural laboratories, while just 16% had Wi-Fi connection. Suffice it to say that the fourteen schools with Wi-Fi are all private schools.

***Table 1: Selected Characteristics of Participants (N=120)***

| Characteristics | Frequency | Percentage | Mean | SD |
|---|---|---|---|---|
| Age (Years) | | | 45.11 | 10.31 |
| **Marital Status** | | | | |
| Married | 85 | 71 | | |
| Not Married | 35 | 29 | | |
| Family Size | | | 4 | 3.22 |
| Sex | | | | |
| Male | 72 | 60 | | |
| Female | 48 | 40 | | |
| Educational Level (years) | | | 15.5 | 10.03 |
| **Religion** | | | | |
| Christianity | 69 | 57 | | |
| Islam | 51 | 43 | | |
| **School Sector** | | | | |
| Public school | 73 | 61 | | |
| Private | 47 | 39 | | |
| Has Electrical connection | 42. | 35 | 0.46 | 0.40 |
| Has Agric. Laboratory | 25 | 21 | 0.20 | 0.06 |
| Has WiFi | 19 | 16 | 0.10 | 5.00 |

Source: Field survey

*Availability and Teachers' Disposition to use of Smartphones in the Classroom*

Table 2 shows the availability of smartphones, in terms of each agricultural science teacher possessing one and their disposition or openness to using it during teaching and learning sessions, and even using it for professional development. As the Table shows, the majority (91%) of the respondents claimed that they owned smartphones while the remaining 11% owned phones, but are not smartphones. Smartphones in the scope of this study are androids or *i*-phones, completely adaptable to different kinds of internet connections and surfing. Majority (64%) of these teachers indicated that their school policy allowed teachers to use smartphones as a teaching tool while a sizeable number of them (46%) claimed to be oblivion of such policy. Their response on school policy allowing students to use smartphones for

educational purposes contrasts sharply, as the majority ((70%) claimed that their school policy did not allow students to use smartphones during lesson hours, and as such, they were not open to the idea of students using smartphones for learning. This perception is quite supportive of the idea that Smartphones are often viewed as a classroom distraction, an opportunity for heinous behaviour, or simply a mode of entertainment (Laskin and Avena, 2015). This finding is consistent with the idea put forth by Palak and Walls (2009) that the availability of technology does not mean teachers will embrace and incorporate it. Further, A total of 106 (88%) of the teachers indicated they were *Open* to the idea of participating in a professional development on utilizing smartphones for learning. While 14, equivalent of 12% indicated otherwise. Similarly, majority (56%) of the teachers indicated that they had no anxiety integrating technology in teaching while about 29% indicated otherwise.15% declared neutrality (I don't know). By the assumption of this study, both teachers that indicated that they had anxiety and those were not specific are classified under the same category, meaning 44% of the sample are classified as having anxiety integrating technology into teaching agricultural science in the classroom. This anxiety can be an offshoot of teachers' inadequate knowledge and skills (proficiency) and, sometimes their beliefs (Smith, Stair, Blackburn and Easley, 2018).

***Table 2: Smartphones Availability and Teachers Openness to utilising them in teaching and Learning Agricultural Science (N= 120)***

| Items | Yes | No | NT |
|---|---|---|---|
| Do you own a smartphone? | 109 (91) | 11(8) | 0 |
| Do you have access to "Wi-Fi" (wireless internet) in your classroom? | 19(16) | 101(84) | 0 |
| Does your school policy allow teachers to use - smartphones in the classroom as a teaching tool? | 64(54) | 0 (0) | 56(46) |
| Does your school policy allow students to use- smartphones in the classroom for educational purposes? | 36(30) | 84(70) | 0 |
| Openness to students utilizing smartphones for learning | 97(81) | 23(19) | 0 |
| Openness to participating in professional development on smartphones for learning | 106(88) | 14(12) | |
| Do you have anxiety for using technology in classroom? | 35(29) | 67 (56) | 18(15) |

*Note.* Percentages are in parentheses
NT means Neutral (I don't know)

*Distribution of Educational Technology by Access to and Integration into Teaching by Agricultural Science Teachers*

*Table 3 shows the distribution of educational technologies by their availability and integration into teaching of agricultural science.*

*Table 3: Use of Educational Technology by Agricultural Science Teachers (N=120)*

| **Educational Technology** | **A** | **B** | **C** |
|---|---|---|---|
| PowerPoint | 17 | 67 | 36 |
| Desktop/Laptop | 13 | 55 | 52 |
| Digital Projector | 28 | 78 | 14 |
| DVD Player and Screen | 56 | 37 | 27 |
| You Tube Channel | 93 | 0 | 27 |
| Smart board | 47 | 53 | 20 |
| Smartphone | 12 | 89 | 19 |
| iPad or other Tablet Apps | 71 | 28 | 22 |
| Document Scanner | 68 | 32 | 20 |
| Facebook and /or Twitter | 23 | 63 | 34 |
| WhatsApp/Telegram | 19 | 83 | 18 |
| Instagram and/or Snapchat | 81 | 31 | 8 |
| Zoom/skype (Video call) | 93 | 09 | 18 |

A= Not Available; B= Available but never put to use; C= Available and utilized appropriately

As Table 3 shows, Majority of the agricultural science teachers indicated that DVD player and screen, YouTube channel, iPad or other tablet Apps, Document scanner, Instagram and Zoom/Skype video were not available at all for teaching in their schools. Many of them, however agreed that certain educational technologies were available in their schools but were not being utilized by them; 67% (for PowerPoint), 55% (for laptop/desktop), 78% (for digital projector), 53% (for smart board), 89% (for smartphone), 63% (for Facebook and/or twitter) and 83% (WhatsApp/Telegram). Conversely, minority, and in most cases, indicated that listed educational technologies were available and were being utilized in their schools. Most of the unavailable educational technologies were not surprising because they are nonconventional facilities (as far as Nigeria is concerned), and requires high profile technical handling and financing. To possess YouTube channel, Instagram and Skype/Zoom requires online registration with institution identity which must maintain consistent appearance and usage, supported by availability of Wi-Fi, which as the Table 3 shows, are lacking in most schools under this study. Inability or unwillingness of agricultural science teachers to utilize available educational technologies as Table 3 reveals, is a confirmation of findings of similar study which implicated teachers' knowledge and skills and attitude as barriers to technology integration in classroom.

***Factors Influencing Integration of Educational Technologies into Teaching of Agricultural Science***

The factors influencing integration of selected educational technologies into the teaching of agricultural science in

secondary schools were examined using equation (3). Table 3 shows the estimated coefficients, their standard errors values and the Cox and Snell Pseudo $R^2$ estimate of logit model. The Cox and Snell Pseudo $R^2$ value of 0.311 shows that the explanatory variables did not explain much of the variations in the dependent variable.

As shown in Table 4, the performance of the individual explanatory variables included in the model indicate that sex, age, religion, having Agricultural Laboratory, having Wi-Fi and having Smartphone did not significantly influence teachers' integration of educational technologies into teaching in the study area.

***Table 4: Factors Influencing Technology Integration in Teaching among Agricultural Science Teachers***

| Explanatory variables | Coefficients | Standard errors | Probability level |
|---|---|---|---|
| Constant | 3.019 | 1.932 | 0.118 |
| Sex | 0.443 | 0.526 | 0.399 |
| Age | 0.131 | 0.222 | 0.555 |
| Marital Status | 1.678** | 0.735 | 0.022 |
| Religion | -0.793 | 0.591 | 0.180 |
| Level of Education | -0.062** | 0.693 | 0.089 |
| Family Size | 0.602* | 0.198 | 0.002 |
| Has Agric Laboratory | 0.469 | 0.475 | 0.323 |
| Has Electricity | -1.285** | 0.574 | 0.028 |
| Has Wi-Fi | 0.150 | 0.520 | 0.773 |
| Teaching in a Private School | 1.412** | 0.560 | 0.012 |
| Has smartphone | -0.802 | 0.914 | 0.877 |
| Technology Anxiety | -0.025* | 0.434 | 0.057 |

* Significant 1%; ** Significant at 5%; Cox and Snell R2: 0.311

Out of the twelve variables included in the model, six turned out to be the main determinants of Agricultural science teachers' integration of educational technologies into teaching, namely: Marital Status, Level of Education, Family Size, Has Electricity, Teaching in a Private School and Technology Anxiety. The coefficients of these variables are statistically significant, while some are negative others are positive. The Positive significance of marital status suggests that the likelihood of integrating educational technologies is more with the married than the unmarried. With marriage comes more responsibilities that are financially entailing. Professional development is one route out of economic crunch, expectedly, with the current economic climate in Nigeria. Married would therefore seek to maximize income by acquiring latent skills for career advancement. Similar explanation goes for family size. Significance and positive nature of Family Size at 1% suggests that with larger families exploring technologies is more likely for this category than the smaller families. The Coefficient of Level of Education was negative and significant indicating that the highly qualified agricultural science teachers are less likely to integrate educational technologies in their teaching compared to their counterparts with lower qualification. No

explanation could be adduced to this except for attitude or beliefs of such teachers, who, in the words of Laskin and Avena, (2015) could be termed digital immigrants who are not always favourably disposed to the use of technology. Similarly, with connection to electricity is less likelihood of integrating educational technologies into teaching by the teachers of agricultural science. This is not unlikely, as majority of teachers indicated that certain educational technologies were available but were not being put to use. (Table 3). Thus, it is a case of available technologies with enabling facility (electricity) but teachers were not exploring the situation to facilitate teaching and learning. The significance of teaching in a private school at 5% level suggests that private school agricultural science teachers were more likely to integrate educational technology than public secondary school teachers. Further, the result shows that agricultural science teachers who usually develop anxiety for applying educational technology are less likely to integrate educational technology during their class. This may not be unconnected with the idea that, with the rapid development of technology, some educators feel intimidated to incorporate applications they do not fully understand (Laskin and Avena, 2015).

## Conclusion and Recommendations

The study showed that majority of the agricultural science teachers in the study area own smartphones, and are somewhat open to using it both for teaching and their professional development. While some of the listed educational technologies were not available in the sampled schools, many of those that were available were not utilized for teaching by the agricultural science teachers as revealed by their responses. The dis connect between availability and a willingness to use the technology within a classroom environment adds to the idea of a new digital divide between students and teachers. The implication of this is that teaching of agricultural science is done using the old, traditional methods that deprive the student's exposure to modern technology-driven pedagogy. Although public schools have more qualified agricultural science teachers as shown by study, private schools seem to be far ahead in terms of technology acquisition and utilization when compared to public schools. It indicates that the use of technology by agriculture teachers in the public schools has remained relatively unchanged over the years. Results from the regression model show that six of the twelve variables fitted significantly influence teachers' educational technology adoption in teaching. These variables include marital status, level of education, family size, having access to electricity, teaching in private school and technology anxiety. The implication of this is that measures to ameliorate negative residual effects of shortfall of teachers in areas must be stepped up for our education to have a headway.

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