



## Lecturers' Perception on the Adoption of Google Applications for Education (GAfE) in Nigeria

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### Abstrak

Aplikasi Google untuk pendidikan (Google Application for Education, GAfE) merupakan aplikasi komunikasi dan kolaborasi yang disediakan oleh Google secara gratis untuk dunia pendidikan. Penelitian ini mengkaji adopsi GAfE oleh para dosen di Universitas Ilorin, Nigeria, terutama untuk mengetahui pemahaman para dosen dalam mengadopsi GAfE untuk perkuliahan. Penelitian ini mengadopsi desain deskriptif, terutama menggunakan survei. Terdapat empat pertanyaan penelitian yang diajukan dan dua hipotesis yang diuji. Sebanyak 168 responden dipilih secara acak, perhitungan frekuensi, persentase, dan rata-rata digunakan untuk menjawab pertanyaan penelitian, sementara hipotesis diuji menggunakan uji-t dan analisis varian (Anova). Penelitian ini merekomendasikan bahwa para dosen hendaknya harus didorong untuk mengeksplorasi manfaat sepenuhnya dari GAfE untuk meningkatkan kualitas pengajaran di kelas.

### Abstract

Google Application for Education is a free suite of hosted communication and collaboration applications, provided by Google for educational institutions. This study investigates lecturers' adoption of Google applications (apps) for education (GAfE) in university of Ilorin, Nigeria. The objectives of the study, among others, were to determine lecturers' perceived adoption of Google Application for Education for instruction in a Nigerian university. The study adopted descriptive research design, using quantitative survey method. Four research questions and two hypotheses were answered and tested respectively. A total of one hundred and sixty-eight (168) respondents were randomly sampled; frequency counts, percentages and mean were employed to answer research questions while hypotheses were tested using t-test and analysis of variance (ANOVA). The findings of the study concluded, among many others, that lecturers perceived adoption and ease of adoption of GAfE for instruction in the university was positive. The study recommended that lecturers should be encouraged to explore full benefits of GAfE to improve classroom instruction.

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## INTRODUCTION

Educational practices in instructional procedures are imperative and fundamental to upgrade and enhance learning with the utilization of innovation. The quick development and value of ICT in instructive establishments has turned out to be unavoidable in this present allotment. Information communication Technology in this present regulation empowers educators and students to be very much outfitted with a digitalize information and aptitudes for the proficient utilization of instructive innovation hardware. Innovation is a solid, quick and agent equipment, which are utilized by the instructor to convey directions. The issues experienced is that lecturers ought to completely augment the use of innovation with the goal that it's doesn't supplant the educators. In any case, instructional substance can be characterized as the innovation with the goals to be a good delivery system of the teaching materials and satisfactory data pointing that the students will learn. The normal execution of mixing innovation utilization with instructional process, teachers and students have shown to have more prominent learning result (Olson et al., 2011).

The utilization of ICT in the field of Education has colossally enhance and has positive effect in the field, which has admirably upgraded the instructional procedure and investigates in the field (Bryant, Ok, Kang, Kim, Lang, Bryant, & Pfannestiel, 2015). The field of instruction has been influenced by ICTs, which have without a doubt influenced education, learning, and research. A lot of research has demonstrated the benefits to the nature of instruction. ICTs can possibly enhance, quicken, advance, and develop abilities, to persuade and connect with students, to help schools' link with the market demand, make financial feasibility for tomorrow's laborers, just as fortifying education and helping schools' change (Singh, 2017)

It is most essential to take note of that Information Communication Technology (ICT) can affect instructional procedures when lecturers are for all intents and purposes digitalized and see how to insert new forthcoming, drifting and current advances technologies in the educational modules. Understanding the significance of the installing new innovations into instructional procedures will upgrade and enhance instructive points, goals and instructive fulfilment.

The progress of higher education in 21st

century is driven by the ability to adapt, change, and grow with technology use. Colleges and universities undergo significant changes to acclimate and utilize current innovations. Allen and Seaman (2014) affirmed that most academic institutions are currently securing efficient ways of deploying web-based instruction systems for designing and delivering their courses online as a result of the rapid growth of educational Apps and e-learning platforms. According to Sloan Consortium (2013), online courses constitute a model of instruction where at least 80 percent of course content is delivered online. The potential of educational Apps, many academic institutions are embracing a variety of Apps as an innovative way of strengthening collaboration among students and academic staff. These Apps are being used either to engage students in traditional classroom instructions or as a supplement to online learning, as they have been at the forefront of supporting global knowledge building. With the rapid development and accessibility of educational Apps, there has been a significant rise in the adoption of these Apps by educators, but the level of use could be higher.

A range of emerging Apps are published on the market every day, and, according to Enis (2013), the popularity and functionality of Apps continue to grow, there is increased collaboration among students and faculty. For example, Wikis have been noted as a social factor in facilitating effective collaboration (Fu, Chu, & Kang, 2013). These Apps are fundamentally interactive computer programs designed to achieve particular usability needs with inherent advantages. Apps (short for Applications) can be defined as a set of interrelated software programs, designed to process data to accomplish a particular purpose that accounts for specific usability goals of the user. The usability goals, such as perceived ease of use, perceived usefulness, perceived effectiveness, as well as perception about safety and utility of the App are key determinants of the user's intention to use and adopt a specific App or technology in general. When an App is designed for pedagogical use, it tends to bridge the gap between education and technology with the aim to drive and advance teaching, research, learning, and administration of schools.

From this definition, GAFE can thus be described as cloud-based solutions, driven by Google App engines, designed to achieve specific educational goals with the aim of transforming the 21st-century educational system. The introduction of Educational Technology such as

Google Apps for Education (GAFE) into schools clearly changes the way education is conducted. Google Apps for Education paves the way for a new pedagogical Approach, where students are expected to play more active roles than before (Amadin, Obieniu, & Osaseri, 2018). Google Apps were designed to facilitate the provisioning of the Google suite of Applications and other collaborative tools, such as Gmail, Google Drive, Google Sites, Google Calendar, Google Docs, Google+, and Google Chat, among others.

GAFE is a free suite of hosted communication and collaboration Application, provided by Google for educational institutions. It features several Web Applications with parallel functionality to traditional office suites, including Gmail, Google Groups, Google Calendar, Talk, Docs, Slides, Drive, and Sites, for communication and collaborative study anytime, anywhere. It also provides a flexible access to higher education, reducing barriers of time and place of study as well as the size of audiences (Brown, 2002). Empirical studies on Google Apps for Education remained controversial among scholars; studies have perceived Google Apps for Education GAFE as purposeful and of significance in instructional and content delivery. For example, Google Apps for Education such as Mail, Docs, Drive, Calendar, and Sites are for content delivery in academic arena (Odewumi & Ahmed, 2019). In the same vein, Ferreira (2014) researched on the implemented of Google Apps for Education as LMS in the context of flipped classroom model, the study revealed that GAFE offers and promotes exchange of information and collaboration easily. The study concluded that Flipping classroom becomes simpler and significant with GAFE. The acceptance and use of Google Apps for Education by lecturers plays an essential and important role in higher institutions. Many studies confirm the importance of staff perception of Educational Technology, which may enhance willingness to accept and facilitate or inhibit use of such innovation. Therefore, lecturers' perceptions should be paid great attention, in order to fully understand the dynamics of acceptance and use of Educational Technology in higher institutions Almobarraz (2007).

Additionally, these pedagogical Apps play a key role especially when integrated into online learning platforms. According to the Babson Survey Research Group (as cited in Allen & Seaman, 2014), the number of students taking at least one online course increased by over 411,000 to a total of 7.1 million from 2012 to 2013. The report

further stated that the percentage of higher education students taking at least one online course was estimated at 33.5%. Education has begun to adapt to the ever-changing trend of emerging technologies through distance learning and online platforms (Hodge, Hodge, & Harman, 2013), as well as the use of educational Apps in higher education. There is increased pressure to provide academically diverse and competent students to improve performance with the delivery of science, technology, engineering, and mathematics (Israel, Marino, Basham, & Spivak, 2013). Besides performance, some online platforms have been designed to provide free and flexible access to learning, for example, massive open on-line course (MOOCs) with the primary objective of making education available to potential learners regardless of geographical, physical, and time boundaries (Shaw et al., 2012). According to Coursera (2014), this innovation enables universities to teach millions of students across the world.

Perception and ease of adoption of Google App for Education (GAFE) for instruction are therefore two important constructs in this study. The word perception is derived from the Latin word 'percipio' which means receiving, collecting, and action of taking possession, apprehension with the mind or senses (Falade, 2013). It is the process of attaining awareness or understanding of sensory information. Perception can also be defined as the process by which organisms interpret and organise sensation to produce a meaningful experience of the world. Sensation usually refers to the immediate, relatively unprocessed result of stimulation of sensory receptors in the eyes, ears, nose, tongue or skin (Falade, 2013). The perception of lecturers on the adoption of Google App for Education (GAFE) computing into the teaching and learning process will go a long way in its easy adoption. Perceived usefulness, according to Davis (1989), is the degree to which a person believes that using a particular system would enhance his or her job performance while perceived ease of use is the degree to which a person believes that using a particular system would be free from effort. Previous studies have focused on the end user perspectives of using the Google App technology. Lian (2015) affirmed that effort expectation, social influence, trust in e-government, and perceived risk have significant effects on the intention to adopt E-invoicing. Additionally, trust in e-government and perceived risk mediates the relationship between behavioural intention and

security concerns regarding e-government.

Sisay (2018) examined university student perception and utilization of technology for learning at Haramaya University in Ethiopia. It was discovered that students have confident insight towards technology utilization for learning from the study. However, majority of the empirical studies above has established that the LMS is a useful innovation, fostering interactive teaching and learning more than residential students.

In respect to technology utilization several research have been conducted to examine factors influencing the use or Application of technology. These factors serve as barrier to the effective utilization of technology among faculty member. These are gender, field of study and age among others (Mahmud, 2006; Venkatesh & Davis, 2000). Gender gap issue has held many researchers' attention and as a result, numerous studies have been conducted to study this gap in ICT. Gender issues is very paramount in all aspects of the society to the extent that access of woman to certain occupation and abilities in higher institution is affected by gender variance. Studies had proven that females tend to be minus involved in computer and use them less often in their spare time. Gender refers to the social difference and correlation between male and female which are learned (Ikolo & Okiy, 2012).

Some previous research indicated no differences between males and females in the use of ICT and LMS while some indicated a significant difference. Some researchers reported that females established negative attitudes and less confidence in using technology (Anderson & Haddad, 2005; Dhindsa & Shahrizal-Emran, 2011; Li & Kirkup, 2007). Onasanya, Fakomogbon, Shehu and Soetan (2010) concluded on the performance of both male and female on the use of ICT to be equally, that is, the post-test mean scores of male and female physics students in the experimental group did not differs, hence the performances of the male and female students were equally enhanced in the group exposed to treatment. Badmus (2013) revealed that there was no significant difference in the performance of students taught with WebQuest based on gender.

However, research on gender indifference in the use of technology in general, reveals that Kaino (2008); Yau and Cheng (2012); and Greenhalgh-Spencer (2020) found a significant difference in learning technology based on gender. That is male students were willing to embrace learning technology than their compared to fe-

male students. It was opined that training course should be organized for the female students. Arbaugh (2000); Wong and Hanafi (2007) on the other hand, observed that male students encountered more trouble when learning technology compared to their female counterparts, that is, female participants possessed a higher level of confidence and improved attitude after undergoing a technology training course.

Ikolo and Okiy (2012) discovered in their study that females use the Internet more than their male's counterpart. Olivia (2009), also conducted a research in relation to gender, finding indicate that male uses the internet than their female counterpart in the use of ICT which indicate a gender barrier. Several studies discovered that male students had more positive attitudes towards e-learning than female students (Liaw & Huang, 2011; Papaioannou & Charalambous, 2011). Wong and Fong (2014) conducted a study on student attitudes to traditional and on-line methods of delivery, finding revealed that there is no significant gender imbalance. When these attitudes were further analyzed based on preference for online learning technology, the Pearson's  $r$  Correlation test revealed both gender groups preferring using online learning technology.

The role of ICTs to various area of specialization is like the role of Mathematics to the physical sciences (Nikolopoulou & Diamantidis, 2014). This implied that there is no discipline that does not required the use of ICTs especially lecturers who are supposed to be custodian of knowledge for effective teaching and research in the university. It can also be noted that the uses of ICT (which subsumes mobile technologies) for effective teaching and research could pose challenges to lecturers irrespective of their area of specialization to solve research and collaboration problem. In another study, Agbonlahor (2008) found that lecturers' use of ICTs is influenced by their area of specialization, level of access to ICT and attitude towards ICTs are independent of academic status and experience of lecturers. Thus, area of specialization may not be an impediment to the development of ICTs usage by lecturers. The inter-connection between learning and teaching with the use of ICT has its usage a world-wide phenomenon. Therefore, there may not be any particular area of specialization that can lay claim of ICT usage. The theoretical study fostering usefulness of GAFE: the conceptual framework was based on the study of Venkatesh et al. (2000) that emphasised



utilising of technology to display an input.

Technological usage and acceptance have received a few attentions. Many models have been put in shape to address the issue. The study of Odewumi (2017) listed Diffusion of Innovation (DOI), Theory of reasoned action (TRA), The Motivational Model (TMM), Technology Acceptance Model (TAM), The Theory of Planned Behaviour, The Social Cognitive Theory, and The Unified Theory of Acceptance and Use of Technology (UTAUT) as common model common in the study of technology. The Unified Theory of Acceptance and Use of Technology (UTAUT) is widely engages based on the Theory of Reasoned Action (TRA) and Technological Acceptance Model (TAM). Researchers confirmed that the use of UTAUT as imperative to sort out the relationship and development, of expectation and use of information innovation.

Despite the excellent benefits that come with the Google Apps for Education, there is no empirical and deductive research investigating the factors associated with the acceptance and use of Google Apps for Education by University lecturers in Nigeria. The University of Ilorin is looking to the educational possibilities offered by Google Apps for Education as a way to expand and improve its education system. Today, University of Ilorin is making efforts and planning to enhance Google Apps for Education use among its staff. To this end, this research is designed to understand how University lecturers accept and use Google Apps for Education in their professional activities and to confront the shortage of studies that have explored the Google Apps for Education use among lecturers in Nigeria. To meet the challenge of 21st-century educational goals, dramatic change should be directed toward the Applicability of Apps in teaching, research, learning, and administration of colleges.

Hence, the study investigates lecturer's' adoption of Google Applications (Apps) for education (GAPE) in university of Ilorin, Nigeria. Specifically, the study examines lecturers perceived adoption and ease of adoption of Google Applications (Apps) for Education (GAPE) based on gender and specialization. The study answers four research questions namely, (1) how lecturers perceive the adoption of Google Application for Education for instruction in university of Ilorin, (2) what the perception of lecturers towards the ease of adoption of cloud computing for instruction is, (3) how lecturers perceive ease of adoption of Google Application for Education

on based on gender, and (4) how lecturers perceive ease of adoption of Google Application for Education based on areas of specialization. This study contributes to the field of educational technology, especially by adding gender issue on using Apps into educational practices. Therefore, this study is important to complement such theories in the selection and use of technological product for education.

## METHOD

This study was a quantitative research. The quantitative research comprised descriptive, correlational, quasi-experimental and experimental. This study adopted the descriptive study of survey type because it allowed for a multifaceted Approach to data collection and analysis, it also helped to gather a large amount of data. It investigated the investigates lecturer's' adoption of Google Applications (Apps) for education (GAPE) in university of Ilorin, Nigeria. A researcher designed questionnaire was used by the researcher to obtain necessary information from the respondents. The population for this study comprised all lecturers in University of Ilorin, Nigeria. Lecturers were sampled across three (3) randomly selected faculties in University of Ilorin, Nigeria. Stratified random sampling technique was used across three (3) faculties in University of Ilorin and one hundred and sixty-eight (168) lecturers were sampled using Research Advisors model of sample size.

The instrument used for data collection was researchers-designed questionnaire with sections A, B and C. Section A solicited information on demographic data of the respondents, Section B elicited information on lecturers perceived adoption of Google Applications (Apps) for education (GAPE) in University of Ilorin while section C elicited information on lecturers perceived ease of use of Google Applications (Apps) for education (GAPE) in instruction in University of Ilorin.

Four likert-scales of strongly agree, agree, disagree, and strongly disagree was used as the response mode. To ensure the face and content validity of the questionnaire used in this study, instrument was vetted by the researchers and four professors and associate professors from the Department of Educational Technology, and Department of Computer science for face and content validity, University of Ilorin validated the instrument to determine the relevance and

suitability of the instrument for the target population. Their advice and suggestions were used to modify the items and ensure that the instrument was valid. It was pilot-tested at the University of Ilorin through split-half method. The coefficient of reliability of 0.87 was obtained through Cronbach alpha. The researchers presented a letter of introduction to the sampled schools to administer the questionnaire on the selected teachers having sought for the permission of the schools' management and personnel. Data obtained through the questionnaire were subjected to descriptive and inferential statistics. Data collected were analysed using mean and percentages. Mean scores were used to answer research questions.

Meanwhile, two null hypotheses were tested, (1) there is no significant difference between male and female lecturers on their perceived adoption of GAFE for instruction and (2) there is no significant difference in lecturers' perceived adoption of GAFE for instruction based on areas of specialization. Hypothesis 1 was tested using independent t-test, while hypothesis 2 was tested using Analysis of Variance (ANOVA). All hypotheses were tested at 0.05 level of significance. Data were coded and analyzed using (IBM SPSS) statistics for version 25.0.

## RESULTS AND DISCUSSION

This part presents the results of the analyses on lecturer's adoption of Google Applications (Apps) for education (GAFE) in University of Ilorin, Ilorin, Nigeria.

### A. Lecturers Perception about GAFE

Research Question one: How do lecturers perceive the adoption of Google Application for Education for instruction in university of Ilorin?

Table 1 presented the result on how lecturers perceived the adoption of GAFE for instruction in university of Ilorin. The results indicated that Such as Gmail, are useful for instruction. The results indicated that 46.4% of the respondents strongly agree that Such as Gmail, are useful for instruction, 38.3% agreed with the statement while 4.1% of the respondents disagreed. It was revealed that Google docs enhances and stimulate learning if properly integrated into instruction, 49.4% of the respondents strongly agreed that Google docs enhances and stimula-

te learning if properly integrated, 26.1% of the total respondents agreed, 8.9% respondents disagreed while 10.1% of the total respondents strongly disagreed with the statement. Google doc are reliable backup for all my documents. There were 39.1% of the whole respondents strongly agreed that google doc are reliable backup for all my documents, 32.8% of the respondents agreed, 4.7% disagreed. Also, 74.4% of the respondents strongly agreed with the statement that the use of Google plus enhance my exposure to relevant media and instructional materials, 20.8% agreed, 4.7% respondents disagreed.

Furthermore, the results established that the collaborative influence of GAFE in instruction. The results established that 68.4% of the respondents strongly agreed that Google Calendar increased my interaction with students, 17.8% respondents agreed, 10.7% respondents disagreed while 2.9% respondents strongly disagreed. Google groups enhance my participation in general discussion about course topics in the classroom. The results further showed that 92.3% respondents strongly agreed with the statements that the use of mobile technologies led to increased classroom product quality, 39.2% of the respondents agreed, 31.8% disagreed, and 13.7% of the respondents strongly disagreed. 71.4% of the respondents strongly agreed with the statement which stated that GAFE like SlideShare would improve my teaching performance, 26.7% respondents agreed, 1.7% disagree. Slide Share save time when used for classroom instruction 69.0% strongly agreed, 19.0% agreed, 11.9% of the respondents disagreed.

With GAFE, students' progress and reports can be easily tracked and students could source for unlimited information with GAFE. University of Ilorin lecturers believed that mobile technologies allow for global communication with 71.4% respondents strongly disagreed, 17.8% respondents agreed, 10.7% respondents disagreed. Assessing students' performance could be done instantly with GAFE. Help stay focused on the task at hand when using skype for instruction with 86.3% strongly agreed, 11.9% agreed, 1.7% disagree. The grand mean score on Lecturers perceived Adoption of GAFE for instruction in University of Ilorin was 2.96. Using a benchmark of 2.50 for 4-likert scale, since the grand mean score of 2.96 was greater than the benchmark, it could thus be deduced that Lecturers perceived Adoption of GAFE for instruction in University of Ilorin was positive.

**Table 1** Lecturers Perception Adoption of Google Application for Education for Instruction in University of Ilorin

S/N	Perceived Adoption of GAFE for Instruction	SA	A	D	SD	Mean
1	Such as Gmail, are useful for instruction.	78 (46.4%)	65 (38.6%)	7 (4.10%)	18 (10.7%)	2.87
2	For example, Google docs enhances and stimulate learning if properly integrated.	83 (49.4%)	45 (26.1%)	15 (8.11%)	17 (10.1%)	2.77
3	Google Doc are reliable backup for all my documents.	105 (62.5%)	55 (32.8%)	8 (4.7%)	-	2.97
4	E.g. Google plus enhance my exposure to relevant media and instructional materials	125 (74.4%)	35 (20.8%)	8 (4.7%)	-	2.96
5	Google Calendar increased my interaction with students.	115 (68.4%)	30 (17.8%)	18 (10.7%)	5 (2.9%)	2.67
6	Google groups enhance my participation in general discussion about course topics in the classroom.	155 (92.3%)	13 (7.7%)	-	-	2.88
7	Like SlideShare would improve my teaching performance.	120 (71.4%)	45 (26.7%)	3 (1.7%)	-	2.88
8	Slide Share save time when used for classroom instruction.	116 (69.0%)	32 (19.0%)	20 (11.9%)	-	2.66
9	Skype give more control over instructional activities.	120 (71.4%)	30 (17.8%)	18 (10.7%)	-	3.15
10	Help stay focused on the task at hand when using skype for instruction	145 (86.3%)	20 (11.9%)	3 (1.7%)	-	2.89
Grand mean						2.96

**Table 2** Perception of Lecturers Towards the Ease of Adoption of GAFE for Instruction

S/N	Perceived ease Adoption of GAFE for	Mean	SD	Remark
1	GAFE tools are easy to use for teaching.	3.17	1.27	Agree
2	GAFE tools are simple to use for teaching.	3.15	0.17	Agree
3	GAFE tools are user-friendly.	2.94	1.23	Agree
4	I learned to use GAFE tools quickly for teaching.	2.19	1.03	Agree
5	I quickly remember how to use GAFE for teaching.	2.40	1.32	Agree
6	GAFE make my work faster.	2.41	1.23	Agree
7	I became more skillful with using GAFE for instruction.	2.84	0.67	Agree
8	My interaction with my student using GAFE is interesting.	2.64	0.45	Agree
9	I can use GAFE for learning without any written instructions.	2.84	0.54	Agree
10	I recover from mistakes quickly when I use GAFE for instruction.	2.91	0.66	Agree
Mean		2.75		

## B. Lecturers Perception about Ease Adoption of GAFE

Research Question Two: What is the perception of lecturers towards the ease of adoption of Google Application for Education in instruction?

It could be noted from table 2 that the respondents were of the opinion that GAFE tools are easy to use for teaching and that GAFE tools are simple to use for teaching as the mean score were 3.17 and 3.15 respectively. Moreover, it was revealed that the GAFE tools are user-friendly with a mean score of 2.94. On the other hand, the respondents perceived to learned to use GAFE tools quickly for instruction with a mean score of 2.19. Also, it was perceived that GAFE make my work faster and that they cannot use social me-

dia in teaching without written instructions with mean score of 2.40 and 2.41 respectively.

On the final analysis, the grand mean score for Lecturers perceived ease of adoption of GAFE for instruction in University of Ilorin was found to be 2.75. With 2.0 as the benchmark, it means that the respondents have positive perception towards the ease of use of GAFE in instruction though the perception was not on the very high side.

## C. Hypotheses Testing

Based on research question 3 and 4 hypotheses 1 and 2 were developed. **Hoi:** there is no significant difference between male and female lecturers on their perceived adoption of GAFE for instruction.

**Table 3** T-test of Male and Female Lecturers on their Perceived Ease of Use of GAFE in Instruction

Gender	No	X	SD	Df	T	Sig. (2-tailed)
Male	98	6.59	4.33	166	.75	.25
Female	72	4.32	2.80			
Total	168					

**Table 4** The ANOVA of Lecturers' Perceived Usefulness of Social in Instruction

	Sum of squares	Df	Mean square	F	Sig.
Between groups	63.28	2	3.64	1.62	.20
Within groups	20839.87	166	9.55		
Total	20903.15	168			

According to Table 3,  $t(166) = .75$ ,  $p = .25$ . That is, the result of t-value of .75 resulting in .35 significance value was greater than 0.05 alpha value. This means that the stated null hypothesis is accepted. By implication the stated null hypothesis was established thus: There is no significant difference between male and female lecturers on their perceived adoption of GAFE for instruction. Based on the earlier mean score of the lecturers' general perception, this means that both male and female lecturers had a high positive perception.

**H02:** there is no significant difference in lecturers' perceived adoption of GAFE for instruction based on areas of specialization

Table 4 indicates that there was no significant difference in the lecturers' teaching experience on their perceived usefulness of social media in instruction.  $\{F(2, 166) = 1.62, p = .20\}$ . That is, the significance value (.20) was found to be greater than the alpha value (0.05). This means that the stated null hypothesis was accepted. By implication, the null hypothesis was established thus: No significant difference exists among, Education, Engineering and Science lecturers on their perceived usefulness of GAFE in instruction.

This paper has tried to reveal that the lecturer's perception on the adoption of google Application for Education was positive. The findings indicated that there was a positive response to all the statements for relative advantage. The finding was in support of Sisay (2018) who reported that students had positive perception toward technology assisted. The finding was also in support of the previous findings of Suorsa and Eskilsson (2014) examined how Google Application are perceived by students in upper secondary school in which ten students were interviewed to detect issues influencing scholar discern-

ments on LMS. Based on the study results it was concluded that the most important finding is that the students' perceptions of a learning management system is mainly influenced by how the system correlates with their educational needs and expectations.

Furthermore, lecturer's perception, perceived ease of adoption of GAFE for instruction based on gender was examined. The result of the t-test established that there existed no significant difference between male and female lecturers perceived and perceived ease of of GAFE for instruction. These findings on gender influence agreed with findings of Olivia (2009) who reported that male uses the internet than their female counterpart in the use of ICT which institute a form of digital divide. Finally, on lecturers perceived ease of adoption of GAFE for instruction based on area of specialization, the result established that there was no significant difference among Sciences, Arts and Social Science lecturers perceived adoption of GAFE for instruction. This finding agreed with the previous study of Ayinde (2011) whose study revealed that the science oriented and non-science-oriented teachers in primary, secondary and tertiary institutions in Niger State were of equal ability in computer usage respectively.

Moreover, the findings supported by the result of Widodo (2017) who submitted that integration of learning model and method promotes GAFE as a LMS that proved supremacy and potential in learning of mathematics and develop communication skills of the pre-service Primary School Teacher. The finding also conformed with the findings of Amali (2017) whose finding confirmed GAFE as significant information tools for students learning. It is also, agreed with that of Ebener (2017) whose findings established that GAFE improves students' performances in written skills and widen students' horizon in the



use of digital devices, hence, it also enhances collaboration and feedback. The findings conform to the conclusion of Brown & Hocutt (2015) who revealed that GAFE is a useful tool for achieving learning goal.

Furthermore, the finding is also supporting the finding of Widodo (2017) who finding revealed that GAFE is significantly improves communication skill among the experiment group. And also, the finding of Cummins-Van-Herreweghe (2016) who confirmed that GAFE is a unique and basic tool for written instructions. More so, the findings also in line with the findings of Azhar and Iqbal (2018) whose finding confirmed that GAFE is having significant impact on the teaching methodologies. On gender, the finding is in line with the findings of Awuah (2015) who stated that the male and female students were fully satisfied in using GAFE and significantly improve and efficient in teaching and learning. And that the males' students are using GAFE more than Female students. Also, the finding favoured the finding of Al-Emran & Malik (2016) whose findings confirmed that both male and female are positive towards using Google Apps for Education (GAFE) because their mean scores was relatively high.

## CONCLUSION

The result obtained from the data gathered and analyzed in this study indicated that lecturers' perceived adoption and ease of adoption of GAFE for instruction in University of Ilorin was positive, there is no significant difference between male and female lecturers on their perceived adoption of GAFE for instruction and no significant difference exists among lecturers from faculties of Education, Engineering and Science on their perceived usefulness of GAFE in instruction.

Based on the findings of this study, the following implications were drawn. The findings of the study have a great implication for teaching and learning approaches especially university education. Adopting GAFE can improve lecturers' instructional strategies and have positive influence on learners' performance. There would be a shift in the learning paradigm and culture from teacher-centred to learner-centred; thereby enable learners to learn actively. Both lecturers and learners would take control of their learning, interact effectively with GAFE learning environment. The findings also have implica-

tions for redesigning some academic programs and curriculum especially in sciences and engineering to accommodate the adoption of digitalized and contextual teaching and learning.

Furthermore, according to the finding, the following recommendations are made: adequate and proper training should be given to the lecturers on how to implement the use of GAFE in their practical based classroom irrespective of their area of specialization. More so, Universities authority should endeavour to make provision for necessary 24hours Technological facilities in terms of the internet connections and electricity this will enhance the deployment of GAFE for instruction. It is also pertinent that seminar, workshop and symposium should be annually organized for lecturers to update their knowledge on the possibilities in GAFE irrespective of gender, qualification and area of specialization.

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