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The Influence of Technological Innovation on the Student of the 9-3-4 Educational System in Ekiti State

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Abstract: Complete or incomplete adoption of technological innovations is of vital importance to its adopters or users. The adoption can change the entire educational system and its units (Pupils/students, method of delivery and teachers). The research objectives are to: explore the consequences of technological innovation on the implementation of the 9-3-4 educational policy on the students of the 9-3-4 educational system in Ado local government area of Ekiti State; describe the impact of technological innovations provided by non-government sector, have on students of the 9-3-4 educational system in Ado local government area of Ekiti State and; identify the barriers relating to students' adoption of technological innovation in Ado local government area of Ekiti State. The research design used was a descriptive survey study. A multi-stage sampling technique was adopted to sample out two higher institutions and three secondary schools. The population of the study include the students of the 9-3-4 educational system. The instrument was administered to three hundred and fifty respondents. Multiple regression was used to test the hypothetical statement; descriptive analysis was deployed to analyze the data collected. The study concluded that there are more female students than males by gender in the schools. Technological innovations have influenced the students of the 9-3-4 educational system to a greater extent. The provided technological innovations by the non-governmental sector have positively impacted the students of the 9-3-4 educational system. It was recommended that the use and donation of technological innovations should be encouraged and used in the school system. It appeals to well-meaning Nigerians to help in the purchase and ensure even distribution of such to the different cadres of the schooling system. The various stakeholders should be orientated and re-orientated about the need to fully adopt technological innovations.

Keywords: Complete Adoption, Policy Beneficiaries, Teachers, Delivery Method, Tripartite

1. Introduction

Continental leaders needed to display good leadership skills that could help the continent to fully adopt and bend to the revolution of technological innovations as its great influences on all spheres of other continents can't be underestimated [1]. Changing the way things are done is a complex affair and one that is difficult to achieve successfully. Success in innovation is always doubtful because people who are prepared to support the innovator can be skeptical about the dream and find it difficult to be convinced and key into it [2]. Educational technological innovation and educational inspirations such as cloud computing, mobile learning, tablet computing open content, learning analytics, games and gamification, 3D printing, virtual and remote laboratories, wearable technology and MOOC are extremely needed in today's dynamic academic space [3].

A key driver for innovation is the adoption rate of new technologies by society. Millennials entering the job market bring a new set of expectations on how to learn and collaborate. They are teaching leaders of training organizations that learning is best achieved in small ongoing increments, over time, accessed on-demand, using multiple devices, and over multiple forms of media [4]. Innovation is the tool of entrepreneurship. Both innovation and

entrepreneurship demand creativity [5-7]. Interchangeably, there is no way one would look into innovation, without talking about creativity and entrepreneurship and vice versa [8, 9]. Creativity is a twain or precept of innovation while entrepreneurship is the compound name for both. Despite the potential benefits of information communication technology (ICT) on modern education, there is still debate and argument on why Nigerian institutions haven't adopted the innovations fully. The use of ICT in educational institutions requires complementary investments in skills, knowledge and organization [10].

The global education system has been witnessing rapid services of technological innovations in which its acceptance and adoption have posed both negative and positive effects on the world's education i.e effects on teachers, students and the system. Technological innovations such as projectors, interactive boards, surfing the web and the open and distance learning programme (ODL), online distance learning etc. – Its wide acceptance and adoption in the western world and middle–east have put an imaginary, an observational and factual gap that has given their outputs worldwide acceptance compare to their Nigerian counterparts. [8, 11, 12]. In 1977, the national policy on education was introduced which was later reversed in 1981, 1998 and 2004, it tends to solve national problems but failed in its pursuance due to poor management and incoherent policies and poor implementations. Due to the yearnings of Nigerians about the insensitivity of the in-use educational system (colonial) to societal needs, in that regard, a national conference was held in 1969 to reform the educational system. The meeting birthed the new National Policy on Education which came on board in 1977 (revised in 1981, 1998, 2004, 2007 and 2013). Based on the kinds of literature and critical views we conclude that 7-5-2-3, 8-5-2-3, 6-5-2-3, 6-3-3-4 and the 9-3-4 educational systems were introduced in 1919, 1954, 1954, 1982, and 2009 respectively.

The new system has been designed to sort out students in their various fields of interest and ability by using a testing technique called continuous assessment, the teaching technique is commutative and cumulative so that at the end the student will be able to identify his/her vocation through guidance and counselling by professional trained teachers and counsellors. This system was formally launched in 2009, on the other hand, the implementation of the policy took off in Ekiti State (2011) as evidence reveals that the policy is not adequately funded, managed and poorly implemented in the selected public schools within Ado local government area of Ekiti state, even the technological aspect of it in the public schools suffer from this but there is little encouragement from the private schools. The practical problem that this inquiry aims to tackle originates from the clear observation that technological innovations changes and add value to the elements (teachers, students/pupils, method of delivery) of the institutions that accept and adopt them. Researchers had concluded various research on technological innovation and its adoption as regard education in Nigeria, Furthermore, it's evident that despite their studies, Nigeria education is still found wanting in terms of technological influences and outcomes on the students/pupils, teachers and the method of delivery. Hence, it's imperative to ascertain the effects of technological innovation on the beneficiaries (Students) of the 9-3-4 educational system. This is the gap that needed to be filled hence, the aim of the research. The broad objectives of the study are to ascertain the effects of technological innovation on the beneficiaries (Students) of the 9-3-4 educational system. Specifically, the study developed the following research objectives:

1) explore consequences of technological innovation on the students of the 9-3-4 educational system in Ado local government area of Ekiti State.
2) describe impact of technological innovations provided by the non-government sector on students of the 9-3-4 educational system in Ado local government area of Ekiti State.
3) identify barriers relating to students' adoption of technological innovation in Ado local government area of Ekiti State.

The hypothesis is a formulated statement of intent that indicates whether there is or there is no relationship or association between two or more variables or constructs. Hypotheses are postulated on an unexpected or unknown statement, which after testing will reveal whether or not, there is an association i.e Hypothesis is moving from unknown to known. However, the hypotheses are all stated in a null form, rejection of which would mean acceptance of an alternative hypothesis.

H_{01}: There is no significant relationship between the vitality of teaching and learning-aided equipment in modern-day education and innovation have made teaching and learning convenient.

H_{02}: There is no significant relationship between the friendliness of technologies and teacher's efficiency in the usage of technological innovations.

2. Literature Review

The need for theoretical support encompassing sound and theoretical paths are not only in the academic discourse but in every facet of letters [13-17]. Four theories were used to support the constructs in the research title: theory on innovation, and education. National policy on science, technology and innovation. And theories that inform understanding of teacher-student relationships. There are five important characteristics of an innovation that affect diffusion: Relative advantage, compatibility, complexity, trial-ability, and observability. The new ideas upon which an innovation is based are communicated over time, through various types of communication channels, among the members of a social system [2]. The national objective of technological innovation is to build a strong science, technology and innovation capability and capacity that will evolve in and around the modern economy. The vision statement of the policy is that by 2020, Nigeria will have a large, strong, diversified, sustainable and competitive

economy that effectively harnesses the talents and energies of its people and responsibly, its natural endowments to guarantee a high standard of living and quality of life to its citizens. This is the last quarter of 2018, is this vision still achievable, bearing in mind that 2020 is just 14 months away? [18].

Conflict theorists do not believe that public schools reduce social inequality. Rather, they strongly believe that the educational system reinforces and perpetuates social inequalities that arise from differences in class, gender, race, social background and ethnicity. Conflict theorists point to several key factors in defending their position. Firstly, property taxes fund most schools; therefore, schools in affluent districts-Lekki, Ajah, Banana Island, Ikeja, and Victoria Island, all in Lagos State and other cities like Bonny Island and Port Harcourt in Rivers State, Abuja and Kaduna etc have more money. Politicians, business moguls and oil magnates are major dwellers and residents of such areas. Their children attend high-class private primary and secondary schools, even the best and most influential private higher institutions. They can afford to pay higher salaries, attract better teachers, and purchase newer textbooks and more technology. Students who attend these schools gain substantial advantages in getting into the best colleges and being tracked into higher-paying professions, with a major consideration of connections [19]. Symbolic interactionists limit their analysis of education to what they directly observe happening in the classroom [20].

The literature regarding teacher-student relationships is dominated by two main theories - Attachment theory and Motivation theory Developmental psychologists have stressed the usefulness of infant and caregiver (this doesn't necessarily mean biological parents) relationship; as one providing a foundation from which infants can explore their environment [21]. By extension of this attachment to teacher-student relationships, it is debatable that students' perception of teacher nurturing and caring for them, can provide a solid basis for students' academic and social growth [22]. Researchers of developmental psychology often view the teacher-student relationship through the mirror of attachment theory. From an attachment theory perspective, an adaptation that helps in the regulation of emotions and navigation of novel situations are the benefits derived from the interactions made between teachers (caregivers) and, infants and children [23]. Furthermore, the current study makes use of relevant works of literature to buttress and expand the scope of the research variables. The whole concept of technological innovation revolves around three main components (invention, realization, and execution). The term technology refers to advancements in the methods and tools used to solve a problem(s) or achieve a goal(s) [24]. But for this research, technology can be defined as advancements in teaching methods, tools and equipment used in solving teaching problems or deterrents to educational objectives. The educational objectives can be specific to an individual, ethnic group, tribe, national government, state or local government. It's simply abolishing the traditional ways of teaching. Having defined terms (technology and innovation). Therefore, it can be concluded that technological innovation in a classroom situation is the generation of new ideas (creativity) by teachers and students, turning the inventions into products or services and implementing and marketing the products/services. However, knowledge and technology capabilities are the underlying factors as a result of technology adoption.

Some of the ways to improve Policies and Access to Technology Education are: Government and school owners should provide enough funds to finance the system and its implementation; The Federal Government and owners of schools should take the responsibility of recruitment and remuneration of teachers in all local government areas. The award of contracts for the UBE projects should follow due process.; Federal government should as a matter of necessity play a leading role by providing 65% of the total fund needed for the scheme while the state and local governments take care of the 35% [8]. The 9-3-4 educational policy came into being as a result of a lack of focus and vision after good twenty-four (24) years of usage of the previous system (6-3-3-4) [25]. Presently, Ekiti State has different phases of education ranging from early childhood education to kindergarten, Nursery, Primary, Secondary and Tertiary Institutions. There are five different educational systems that Nigeria had and still using, since her amalgamation in 1919 till date; 7-5-2-3 and 8-5-2-3 educational systems were used between 1919 and 1954. Subsequently, 6-5-2 3 and 6-3-3-4 were introduced in 1954 and 1982 respectively. The current system of 9-3-4 was introduced in 2009 by Goodluck Jonathan's administration. The current operational educational system is broken into phases and the expected age to start and complete each phase. Basic level education comprises kindergarten, primary and junior secondary school (1-13 years), Middle-level education (14-17years) and higher-level education (18 and above).

A hasty look at the Nigeria Educational system shows that the system is faced with multi-dimensional threats which need a multi-dimensional approach to proffer solutions; the problems are embedded in the implementation, administration and management of the sector. The philosophy, aims, objectives and system were designed to meet the vision 20 – 20 which was later changed to the 20–50 target, as it was geared towards sustainable development goals (SDGs) in line with the United Nations sustainable development goals, The study is designed to ascertain the effects of technological innovations on the (policy implementers) teachers and (beneficiaries) students of the 9-3-4 educational system in Ado local government area of Ekiti State, in which national policy is a major element to consider. In other to generate valid responses that will stand the test of time, assessing the system and the use of technologies will be the utmost priority of the researcher [26]. There are three major components of the 9-3-4 educational system namely: Teachers/facilitators/instructors; Students/pupils; and the method of delivery. From previous, similar works, and

reality teachers, pupils and the method of delivery are at the receiving end which has been identified as elements that will be affected negatively and positively based on adoption and non-adoption. Student, the outcome or product of the system which is the student will either get better, employable and scalable. Effective and efficient usage of technology by teachers will go a long way in shaping the course of Nigeria. Hence, teachers are expected to be exposed to and trained in making use of the adoptions. Subsequently, these teachers should facilitate/teach in a manner that such teaching will stock into him/her and the students/pupils as it's evidentially known that real object and in pragmatism will wholly or skeptically remain with the learning and learned students for a very long time.

The interaction that exists between teachers and students in school and beyond was emphasized by psychologists and researchers, by making use of the attachment relationship that exists between parents and children. There are three elements instituted as regards the attachment theory; Closeness, Dependency and Conflict.

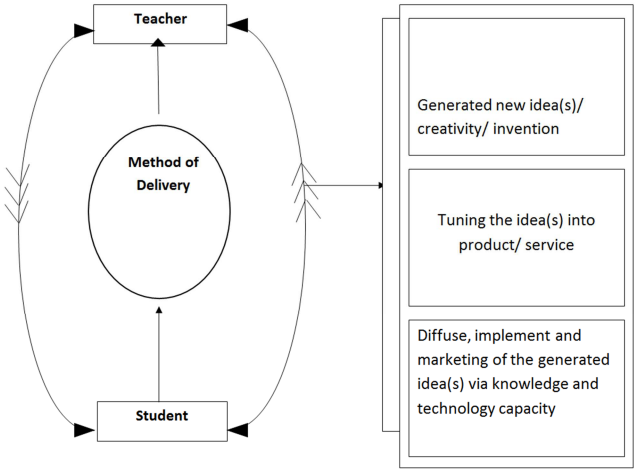
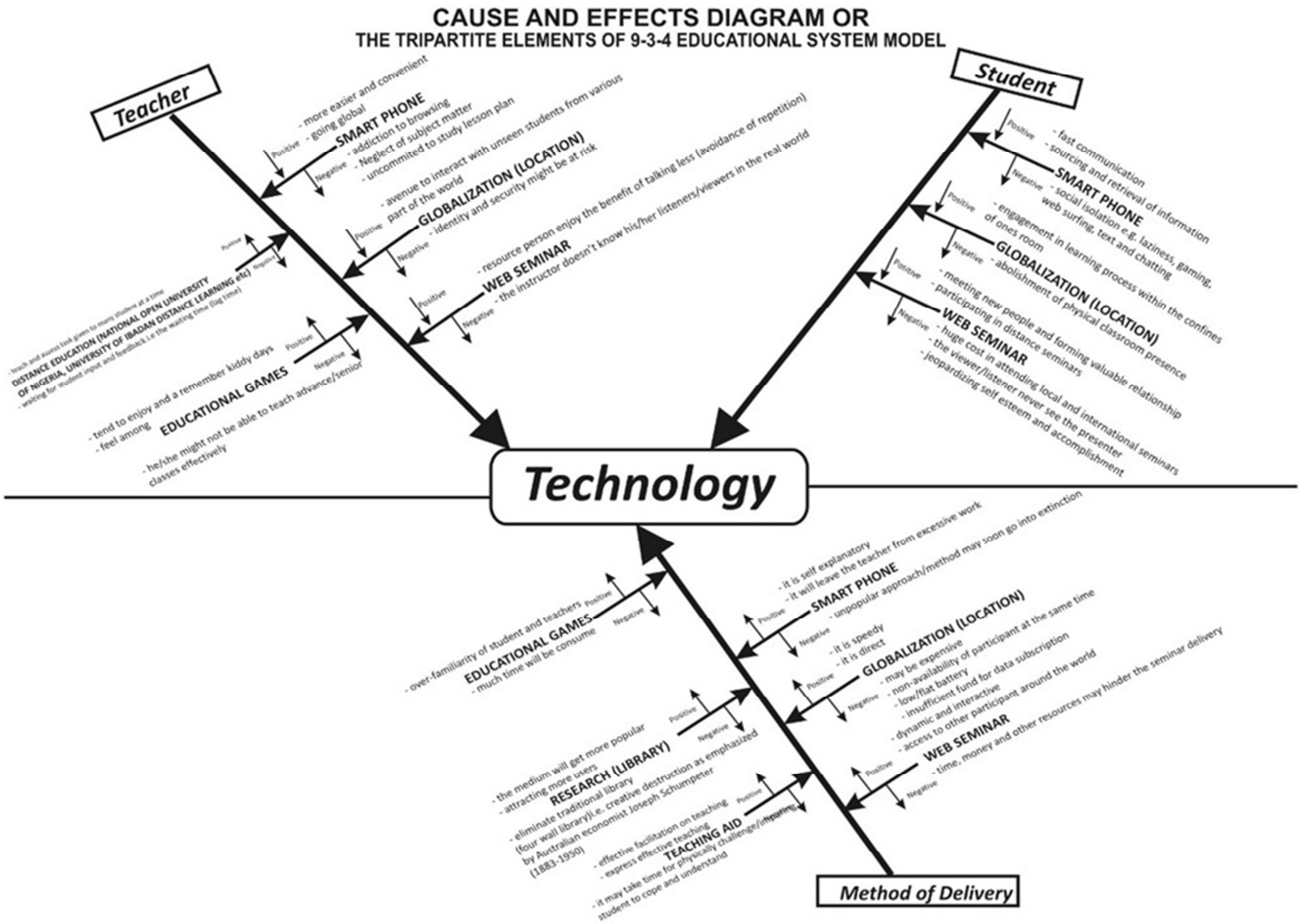


Figure 1. *Relational model of the tripartite and adoption of technological innovation in a classroom situation.*

Source: Researcher's Conceptualization (2019).

None of the elements is independent on its own i.e they are mutually exclusive. The adoption affects the elements at every stage of teaching and learning.



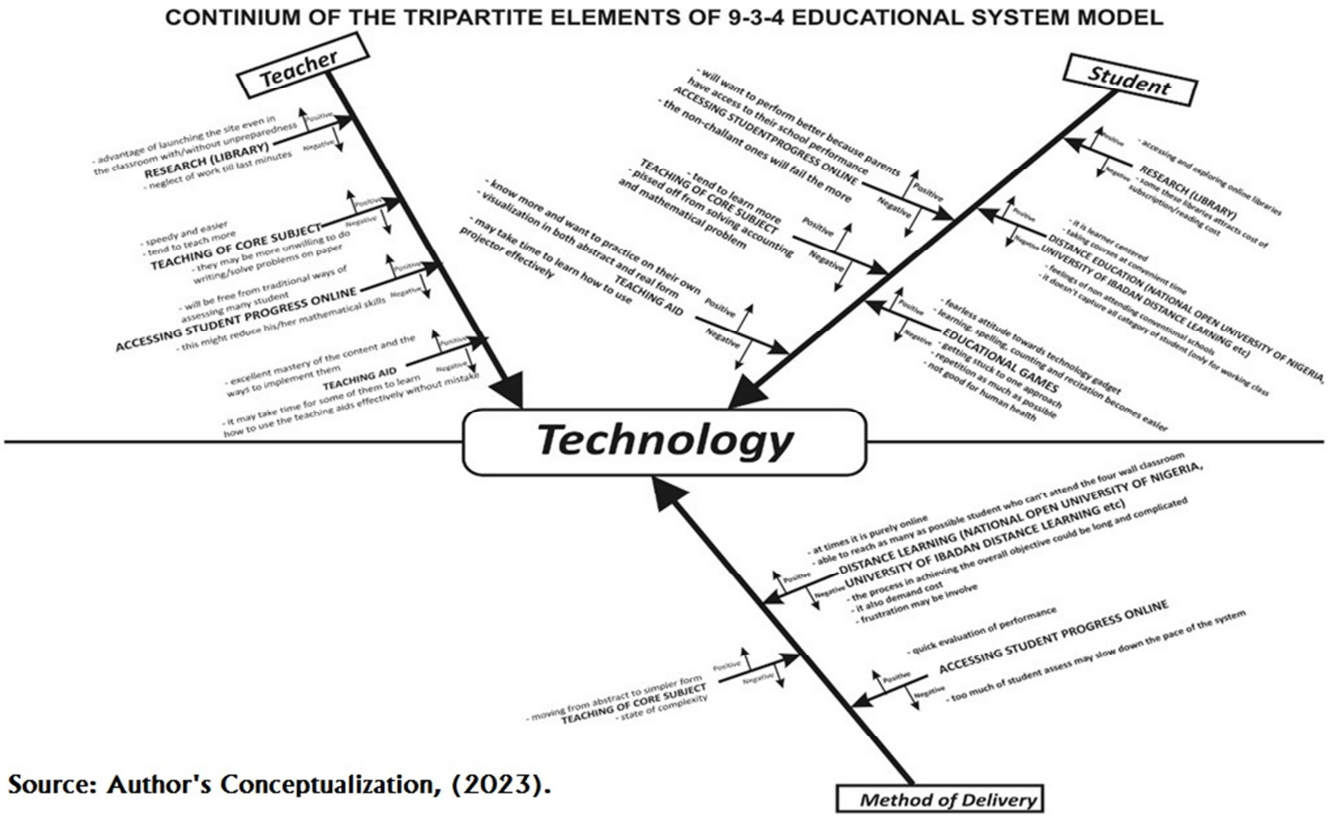


Figure 2. *Cause and Effect Diagram on the Tripartite Element of 9-3-4 Educational System Model.*

This is a fish-like diagram that shows the relationship among the three varies of teachers, students and technology. i.e technology is core to the output of the three.

3. Methods

A descriptive cross-sectional survey design was used for the study. Students are the study's population. Two higher institutions and three secondary schools in Ado local government were sampled using the multistage probability sampling technique. Mean and Standard deviation statistical tools and multiple regression statistical tools were used to analyze the close-ended questionnaire and were used to test the stated hypotheses respectively. The secondary school has (fifteen public and forty-three private) and higher institutions have (four public and four private) within the Ado local government area of Ekiti State. However secondary schools and higher institutions were used, the reason being that the knowledge of the primary school pupils isn't comprehensive enough to give responses to the developed self-designed instrument. In addition, the precise number of students is not available, so the study made use of three hundred and fifty respondents which is representative enough. The data administration and collection were done in a full month. Cronbach's alpha method was used to test the reliability of the instrument and the determined coefficient was 0.9. An instrument can be said to be reliable when the reliability coefficient can be approximated to one (1) [27]. Two research assistants were employed for data administration and collection. The research assistants were trained on the effective way of successful administration and collection of data. The data collected was analyzed by the use of Statistical Program for Social Science (SPSS) version 25.

4. Results and Discussion

Table 1. *Demographic Characteristics of the Respondents.*

Variables	Frequency	Percentage
Gender		
Male	117	33.7
Female	230	66.3
No Response	3	-
Total	350	100
Age		
Below 15	74	21.4
16-30	259	75.1

Variables	Frequency	Percentage
31-45	11	3.2
46-60	1	0.3
No Response	5	-
Total	350	100
Level of Education		
Secondary	214	61.7
Tertiary institutions	130	37.5
Others	3	0.9
No Response	3	-
Total	350	100
Area of Specialization		
Sciences	150	43.2
Art/Humanities	62	17.9
Commercial	111	32.0
Others	24	6.9
No Response	3	-
Total	350	100

Source: Field Work, (2019).

Table 1 above indicated that the majority of the respondents are females (66.3%) and (33.7%) for the male category. The implications of these are, female respondents are more than their male counterparts. Female students occupy more space on the schools' register than the opposite sex in the selected schools, where the instrument was administered. On the age range, this shows that students that fall within the age range of 16-30 (75.1%) dominated both secondary and higher institutions selected, follow by those below 15 (21.4%) these are typically secondary school students, the next on the ladder is 31-45 (3.2%) these are mainly students of tertiary intuitions of the selected schools, same go to the last category 46-60 (0.3%).

Level of Education: this reveals the sequentially of the respondents' education, the majority of the respondents are secondary school students (61.7%), followed by respondents of tertiary institutions (37.5%), and others (0.9%). This shows that the administration of the instrument was done majorly in secondary school, respondents that ticked and category that ticked 'others' decided to do so, in other to reveal that they went to technical or health technology schools before proceeding to tertiary.

Area of Specialization: A larger percentage of the respondents are in Sciences (43.2%), followed by Commercial (32.0%), Art/Humanities (17.9%), and others (6.9%). Those respondents that ticked 'others' neither belong to any of the earlier categories, this set of people are in university and polytechnic selected. This implication is that students are enrolled to be in science classes more than other departments and as such there will be a shortage of professionals in those two fields in the later future.

Table 2. *The Consequences of Technological Innovation on the Students of the 9-3-4 Educational System.*

S/N	Statement	Mean	Std. DV	Remarks
1.	My usage of smartphones has increased and improved my communication skills via email and social media.	3.95	0.20	Accepted
2.	I have been able to source and retrieve information with the use of my smartphone.	2.59	1.28	Accepted
3.	Technological innovation has helped me to access and explore online libraries such as the school's e-library, web-ology, afribary etc.	2.67	1.44	Accepted
4.	Teaching aids -marker, projector, smartboard, Microsoft office, laptop, tape video recorder, and gramophone being in use in my school have aided me to know and make use of the technological innovations.	1.65	0.91	Rejected
5.	The use of the technologies has enabled the opportunity to learn processes within the confines of my room.	3.78	0.46	Accepted
6.	The constant usage has afforded me to develop a fearless attitude toward technological gadgets	2.63	0.53	Accepted
7.	Have been able to form valuable relationships with other students by participating in distance seminars.	3.65	1.76	Accepted
8.	I am pissed off about using a computer to solve accounting and mathematical related problems.	1.66	0.56	Rejected
9.	Have been able to attend classes at a convenient time, as the system is learner-centred.	3.76	0.50	Accepted
10.	It has enabled me to perform better because parents have access to my school performance	0.71	0.54	Rejected

Source: Fieldwork, (2019).

In table 2 above, Items 1, 2, 3, 5, 6, 7 and 9 have mean scores of 3.95, 2.59, 2.67, 3.78, 2.63, 3.65 and 3.76 respectively which are above the mean cut-off points of 2.50 indicating that these items are accepted while items 4, 8 and 10 have mean scores of 1.65, 1.66 and 0.71 which are lower than the 2.50 mean cut off point indicating that the items are rejected. Therefore, the items are accepted since the items above the mean scores are greater than the items below. This implies that technological innovations have influenced the students of the 9-3-4 educational system to a greater extent. The educational policy has not been fully implemented in the local government area. This finding is in line with the work of D. O. Okocha et al. which indicated that technological innovation greatly influences people in all spheres. Similarly, in a wider scope R. Wajszczyk finds out that such innovation influences both teacher and

student. Also, the findings negate the research of R. E. Clark which stated that such a medium doesn't influence students [1, 28, 29].

Table 3. *The Impact of Technological Innovations Provided by the Non-Government Sector on Students of the 9-3-4 Educational System.*

S/N	Statement	Mean	St. Dv	Remarks
11.	Smartphone usage has made me socially isolated-texting, chatting, gaming, and web surfing during and after lessons.	3.68	0.52	Accepted
12.	There are donations from the international community as regards the 9-3-4 system.	1.69	0.58	Rejected
13.	The usage of technologies in the classroom has helped me to learn more.	2.96	0.64	Accepted
14.	Have been able to learn and retain for a longer period, whatever my teacher teaches in class.	2.01	0.68	Rejected
15.	There have been donations for the international community as regard technology usage in the 9-3-4 school system	2.79	0.87	Accepted

Source: Fieldwork, (2019).

In table 3 above, Items 11, 13 and 15 have mean scores of 3.68, 2.96, and 2.79 respectively which are above the mean cut-off point of 2.50 indicating that these items are accepted while items 12 and 14 have mean scores of 1.69 and 2.01 which are lower than the 2.50 mean cut off point indicating that the items are rejected. Therefore, the items are accepted since the items above the mean scores are greater than the items below. This implies that the provided technological innovations by the non-governmental sector have positively impacted the students of the 9-3-4 educational system in the local government area of Ado-Ekiti. Educational gadgets have enabled students to have access to gaming and web surfing. All these and others have helped the students to learn more and for high retention. This finding is against what the study was able to spot during the familiarization visit and fieldwork. It's an indication that the students aren't sincere and honest in their responses to the instrument.

Table 4. *The Barriers Relating to Students' Adoption of Technological Innovation.*

S/N	Statement	Mean	Std. DV	Remarks
16.	The school management has a strong desire to make use of the innovations.	2.78	0.48	Accepted
17.	Students are willing to acknowledge and accept the use of technological innovation.	1.67	0.46	Rejected
18.	Parents and guardians see the improvement of innovation in education as harmful to their children.	3.50	0.55	Accepted
19.	Hosting communities play a major role in the adoption of technological innovation.	2.66	0.58	Accepted
20.	Shortage of power supply is a barrier to innovative teaching activities.	2.73	0.46	Accepted

Source: Fieldwork, (2019).

In table 4 above, items 16, 18, 19 and 20 have mean scores of 2.78, 3.50, 2.66 and 2.73 respectively which are above the mean cut-off point of 2.50 indicating that these items are accepted while item 17 has a mean score of 1.67 which is lower than the 2.50 mean cut off point indicating that item 17 is rejected. Therefore, the items are accepted since the items above the mean scores are greater than the items below. This implies that the enumerated indices are problems militating against the adoption of technological innovation in the Ado local government area of Ekiti State. It's an indication that power supply, hosting communities, unwillingness or ignorance of parents and guardians, and lack of interest from the school management are all barriers that face the adoption of technological innovation in the Ado local government area of Ekiti State. This finding is in alignment with the reality of the current situation in the study area.

Table 5. *Testing of Hypothesis One.*

Correlations			
		Innovation has made teaching and learning more easier and convenient	Teaching and learning-aided equipment are considered to be vital in modern-day education.
Innovation has made teaching and learning more easier and convenient	Pearson Correlation	1	.281**
	Sig. (2-tailed)		.001
	N	148	148
Teaching and learning-aided equipment are considered to be vital in modern-day education.	Pearson Correlation	.281**	1
	Sig. (2-tailed)	.001	
	N	148	148

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Field Work, (2019).

Interpretation of Result

The above result measured the relationship between the vitality of teaching and learning-aided equipment and innovation that has made teaching and learning convenient. Pearson product-moment correlation coefficient (r) gave a significant p-value of 0.001, which is less than alpha 0.01 as shown in the table above. This study reveals that there is a correlation between teaching and learning made easy and the essentiality of modern-day education's teaching and learning-aided equipment. This, therefore, implies that a greater proportion of vitality of teaching and learning-aided equipment is a result of innovation. Hence, the decision rule would be to reject the null hypothesis

(HO). Therefore, we conclude that there is a significant relationship between the vitality of teaching and learning-aided equipment in modern-day education and innovation has made teaching and learning convenient.

Table 6. *Testing of Hypothesis Two.*

Correlations			
		The technologies are user friendly	**The efficiency level of teachers/facilitators is high.**
The technologies are user friendly	Pearson Correlation	1	.258**
	Sig. (2-tailed)		.002
	N	147	147
The efficiency level of teachers/facilitators is high.	Pearson Correlation	.258**	1
	Sig. (2-tailed)	.002	
	N	147	148

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Field Work, (2019).

Interpretation of Result

The above result measured the relationship between technologies being user-friendly and the efficiency of teachers' usage of technological innovations. Pearson product-moment correlation coefficient (r) gave a significant p-value of 0.002, which is less than alpha 0.01 as shown in the table above. This study reveals that there is a correlation between the friendliness of technologies and teachers' efficiency. This, therefore, implies that a greater proportion of teachers' efficiency is a result of technologies being user-friendly. Hence, the decision rule would be to reject the null hypothesis (HO). Therefore, we conclude that there is a significant relationship between the friendliness of technologies and teachers' efficiency in the usage of technological innovations.

5. Conclusion and Recommendations

Based on the results, the study concluded that there are more female students than males by gender in the schools. The students are in the science department, as it was observed that the study has secondary school as its major component of the 9-3-4 educational system. Also, technological innovations have influenced the students of the 9-3-4 educational system to a greater extent. The provided technological innovations by the non-governmental sector have positively impacted the students of the 9-3-4 educational system. The enumerated indices are problems militating against the adoption of technological innovation in the Ado local government area of Ekiti State. From the findings, the study, therefore, recommended that the use and donation of technological innovations should be encouraged and used in the school system. It appeals to well-meaning Nigerians to help in the purchase and ensure even distribution of such to the different cadres of the schooling system. The various stakeholders particularly the host communities, community leaders, parents and guardians, students, and the school management should be orientated and re-orientated about the need to fully adopt the technological innovations.

Conflict of Interests

The author declare that there is no competing interests.

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