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Influence of Satellite Communication Devices on Undergraduates' Academic Performance in Ogun State, Nigeria

Adefuye Adetayo Linus[1], Ishola Adebayo Monsur[2], Fasina Joke Elizabeth[3], Quadri Taofeek Adedayo[4], Adefuye Adesayo Justina[5]

[1,2,3,4] *Department of Educational Technology, Tai Solarin University of Education, Ijagun, Ijebu Ode, Nigeria*
[5] *Department of Public and International Affairs, Faculty of Social Sciences, University of Lagos, Lagos, Nigeria*
[1*] adefuyeal@tasued.edu.ng; isholaam@tasued.edu.ng; fasinaje@tasued.edu.ng; taofeekquadri@yahoo.com; adesayoadefuye@gmail.com

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ABSTRAK

Penelitian ini menilai pengaruh perangkat komunikasi satelit terhadap kinerja akademik mahasiswa sarjana di Negara Bagian Ogun, Nigeria. Penelitian ini menggunakan desain survei deskriptif. Teknik pengambilan sampel acak sederhana digunakan untuk memilih dua ratus (200) mahasiswa sarjana dari Departemen Teknologi Pendidikan, Tai Solarin University of Education, Ijagun, Negara Bagian Ogun. Instrumen pengumpulan data yang digunakan adalah kuesioner yang disusun sendiri oleh peneliti. Analisis data dilakukan dengan statistik inferensial (uji t, ANOVA, dan analisis regresi berganda). Hasil penelitian menunjukkan bahwa akses dan pemanfaatan perangkat komunikasi satelit berpengaruh signifikan terhadap pembelajaran mahasiswa, dengan pemanfaatan memberikan kontribusi yang lebih besar dibandingkan akses. Namun, faktor gender tidak berpengaruh signifikan terhadap akses maupun pemanfaatan perangkat tersebut untuk tujuan pembelajaran. Sebagai simpulan, perangkat komunikasi satelit memiliki dampak positif yang signifikan terhadap kinerja akademik mahasiswa sarjana. Berdasarkan temuan tersebut, direkomendasikan agar staf akademik dapat memanfaatkan tingginya tingkat akses dan penggunaan perangkat komunikasi satelit di kalangan mahasiswa dengan mengintegrasikannya ke dalam metode pengajaran dan pembelajaran. Misalnya, dosen dapat menggunakan video daring atau podcast untuk melengkapi perkuliahan atau memasukkan program televisi yang relevan ke dalam materi kuliah. Hal ini dapat meningkatkan keterlibatan, minat, dan hasil belajar mahasiswa.

ABSTRACT

This study assessed the influence of satellite communication devices on undergraduates' academic performance in Ogun State, Nigeria. Descriptive survey research design was adopted for the study. Simple random sampling technique was used to select two hundred (200) undergraduates in the Department of Educational Technology, Tai Solarin University of Education, Ijagun, Ogun state. The instrument for data collection was a self-constructed questionnaire. The data analysis was subjected to inferential statistics (T-test, ANOVA and Multiple Regression Analysis). Findings revealed that access and utilization of satellite communication devices significantly influence undergraduate learning, with utilization contributing more than access. However, gender does not significantly affect either access or utilization for learning purposes. In conclusion satellite communication devices have a significant positive impact on undergraduates' academic performance. Based on the findings, it was therefore recommended that academic staff can leverage the high access and utilization of satellite communication devices among students by incorporating them into their teaching and learning methods. For instance, they could use online videos or podcasts to supplement their lectures or incorporate relevant television programs into their course content. This can enhance student engagement, interest, and learning outcomes.

1. Introduction

Communication plays a big role in teaching and learning. It helps students understand their lessons, ask questions, and share ideas. Without good communication, learning would be slow and difficult (Horn, 2020). Today, students don't only talk face-to-face. They now use different tools like phones, laptops, emails, and even social media to talk and learn. These tools help them connect with teachers and classmates faster and easier. In

fact, the use of digital communication tools is now common in schools and universities across Nigeria and other parts of the world (Eagly & Crowley, 2021).

Academic performance means how well a student is doing in school. It includes things like grades, test scores, and participation in class activities (Eccles, Jacobs, & Harold, 2020). Many people are now asking if the use of satellite communication devices is helping or harming students' academic success. While some studies say that these tools help students perform better by giving them easy access to learning resources, others say it can cause distractions and reduce focus (Eagly & Crowley, 2021). In Nigeria, some students use satellite tools to improve their studies by attending online lessons, reading e-books, and joining academic forums (Ojo & Adewoye, 2021). But others use them mainly for fun or to waste time. This shows that the effect of these devices depends on how students use them (Yaylaci & Yaylaci, 2021).

Satellite communication devices are tools that use signals from satellites in the sky to send and receive information. This means they don't need wires or mobile networks to work. Some common examples are satellite phones, GPS devices, and satellite internet. These devices are very useful for students, especially those who live in remote areas with poor network signals. With these tools, they can connect to the internet, attend online classes, download study materials, and even join group chats from anywhere (Bakare, Odu, & Ngeri, 2021). This has made learning easier for many students, even in rural places in Nigeria. Many students are now using satellite communication devices more than before. This is because they want to stay connected and access the internet easily (Akintayo & Adebola, 2020). In Nigeria, where some places have poor mobile networks, satellite internet is becoming a better option for students who want to learn online (Samuel, 2020). Also, satellite devices can give faster and more stable internet, which helps students stream videos, join virtual classes, and do their schoolwork smoothly. Some students prefer these devices because they allow them to connect to learning platforms at any time without worrying about network issues (Bakare et al., 2021).

Satellite communication tools help students in many ways. For example, they allow access to online lectures, learning materials, and even educational apps (Yaylaci & Yaylaci, 2021). Students can do research, join discussions, and work on group assignments without being physically present. These tools make learning flexible and faster, especially for students who are always on the move or who live far from school (Eke & Ukaegbu, 2018). However, there are also some problems. Some students get distracted and use these devices for chatting on social media, watching movies, or playing games during study time (Akintayo & Adebola, 2020). This can affect their concentration and reduce their academic performance. Also, when students spend too much time online, they may forget to study or do their assignments on time (Gaddy, 2021).

It is very important to study how satellite communication devices affect students. This is because technology is now a big part of education, and we need to understand its effects. Knowing if these devices help or harm students can guide schools, parents, and even the government to make better decisions. For example, schools can decide if they should invest more in satellite internet or train students on how to use the devices the right way. Parents can also monitor their children's use of technology at home and encourage good habits. Moreover, this study is important in Nigeria because not all students have access to good mobile networks. Satellite tools can help reduce this problem and give more students the chance to learn without network troubles. If used well, these devices can help bridge the gap between students in urban and rural areas. Past efforts like awareness campaigns and usage guidelines have not fully worked. Although studies like those by Bakare et al. (2021) and Eke and Ukaegbu (2018) talk about the importance of satellite devices in education, they do not clearly show how these tools affect academic results of Nigerian students. Hence, it is therefore imperative to investigate the influence of satellite communication devices on undergraduates' academic performance in Ogun state, Nigeria.

1.1. Research Hypotheses

The following hypotheses were tested in order to guide the study:

$H0_1$: There is no significant difference in undergraduates' level of access to satellite communication devices for learning

$H0_2$: There is no significant difference in undergraduates' level of utilization of satellite communication devices for learning

$H0_3$: There is no significant difference in undergraduates' access to satellite communication devices for learning based on gender

$H0_4$: There is no significant difference in undergraduates' utilization of satellite communication devices for learning based on gender

$H0_5$: There is no significant influence of satellite communication devices on undergraduates' academic performance

2. Literature Review

2.1. History and trend of the use of satellite communication

Satellite communication is a method of transmitting and receiving information using artificial satellites orbiting the earth. The first successful satellite communication took place on October 4, 1957, when the Soviet Union launched Sputnik 1, the world's first artificial satellite. The satellite transmitted a simple beacon signal that could be received by amateur radio operators around the world (Yung-Wey & Tat-Chee, 2018). In the decades since, satellite communication has become an integral part of modern life, providing a range of services including television and radio broadcasting, internet connectivity, and telephone services. The development of satellite communication has been driven by advances in rocketry, electronics, and materials science, as well as the demand for reliable and efficient ways to transmit information over long distances (Horn, 2020). One of the key innovations in satellite communication has been the development of geostationary satellites, which orbit the earth at an altitude of about 36,000 kilometers (22,000 miles) and remain stationary relative to the earth's surface. These satellites are particularly useful for communication because they can be used to transmit and receive signals from a fixed location on the earth's surface (Slotten, 2020). Other important developments in satellite communication include the use of low Earth orbit (LEO) satellites, which orbit the earth at altitudes of less than 2,000 kilometers (1,200 miles), and the use of satellite constellations, which are groups of satellites that work together to provide coverage over a large area (Horn, 2020).

According to Geneste (2020), the history of satellite communication can be traced back to the early 20th century, when scientists and engineers first proposed the idea of using artificial satellites to transmit information. However, it was not until the latter half of the 20th century that the technology and infrastructure needed to make satellite communication practical became available. One of the key milestones in the development of satellite communication was the launch of Sputnik 1 in 1957 by the Soviet Union. This small satellite transmitted a simple beacon signal that could be received by amateur radio operators around the world, and it demonstrated the feasibility of using artificial satellites for communication (Chang, Cheng and Wu, 2018). Nigeria has made use of international satellite systems for communication purposes. For example, the country has leased capacity on the INTELSAT and EUTELSAT satellite systems to provide a range of services including internet connectivity, television and radio broadcasting, and telephone services. Satellite communication has been an important part of the telecommunications landscape in Nigeria, helping to connect people and organizations in remote and underserved areas and to facilitate the exchange of information and ideas. The use of satellite communication has grown significantly since the first successful satellite communication took place in 1957 with the launch of the Soviet Union's Sputnik 1 satellite (Nkanga, 2017).

Nigeria's journey into satellite technology began in 1976 but only became successful on September 27, 2003, when the country launched its first satellite, NigeriaSat-1. Built by Surrey Space Technology Limited in the UK and launched from Russia, it cost the Nigerian government $30 million. The satellite was mainly designed for monitoring disasters, desertification, pollution, and health issues like malaria and meningitis. It also supported distant learning and helped in mapping borders for peacekeeping (Samuel, 2020). Later, on May 13, 2007, Nigeria launched its second satellite and Africa’s first communication satellite, NigComSat-1. It was built in China and launched from the Xichang Satellite Launch Centre at a cost of 32 billion Naira. NigComSat-1 was designed to support internet, communication, health, education, and security services across Africa and some parts of Europe. Unfortunately, just 18 months later, on November 10, 2008, the satellite experienced a failure in its solar panel and was shut down to prevent damage. By the next day, it completely lost power and failed in orbit (Bakare, Odu & Ngeri, 2021). These events show Nigeria's serious efforts in using satellite technology for national development, despite technical setbacks.

2.2. Use of satellite communication device for learning

Darshna and Devika (2020) reviewed the overview of satellite communication. The transfer of information from source to destination i.e transmitter to receiver is called the communication. Basically communication is possible in two ways they are wire communication and the other one is wireless communication. The satellite communication is a best example for the wire-less communication. In this paper we are first giving a brief satellite history and next why we are using satellite for communication and the orbital model. How the satellites stay in orbits and orbit types. After we are concentrating how an artificial satellite is launched. And what components required for satellite designers. And after we are giving few applications and key research challenges. The study concluded that satellite is a wide area of study, it’s orbit and speed can do the operation in different way, perform various operation so, wireless communication is possible, still some area are yet to be invented like in advance disaster can be identified, how much area will be affected may be identified in advance.

Na, Park, Ko and Alouini (2021) examined the performance analysis of satellite communication systems with randomly located ground users. Satellite communication (SatCom) is an essential component of next-generation

wireless communication to achieve a goal of ubiquitous connectivity on globe. The outage event of SatCom link connecting to a network is more critical in an infrastructure-deficient remote area. In this paper, we analyze outage probability (OP) and symbol error rate (SER) over SatCom downlink channels when the users are randomly located in single beam and multibeam area. The downlink beams will suffer from propagation loss and the shadowed-Rician fading depending on the user location which is assumed to follow a Poisson point process. For mathematically tractable, informative, and insightful interpretation, we obtain the asymptotic OP and SER expressions of user link under several channel conditions in the high power regime. Finally, numerical results are presented to verify the analysis and show the accuracy of the asymptotic results.

Kodheli (2021) examined the future challenges of satellite communications in the new space era. Satellite communications (SatComs) have recently entered a period of renewed interest motivated by technological advances and nurtured through private investment and ventures. The present survey aims at capturing the state of the art in SatComs, while highlighting the most promising open research topics. Firstly, the main innovation drivers are motivated, such as new constellation types, on-board processing capabilities, non-terrestrial networks and space-based data collection/processing. Secondly, the most promising applications are described, i.e., 5G integration, space communications, Earth observation, aeronautical and maritime tracking and communication. Subsequently, an in-depth literature review is provided across five axes: i) system aspects, ii) air interface, iii) medium access, iv) networking, v) testbeds & prototyping. Finally, a number of future challenges and the respective open research topics are described.

Galeb, Saad, Bashar, Al-Majdi and Al-Hilali (2024) investigated the challenges and opportunities of advancements in satellite communication systems. From its early days as a fledgling technology, satellite communication has come a long way to become a flourishing component of the global technological ecosystem that determines our increasingly interdependent world. This scholarly essay provides a comprehensive analysis of current developments in satellite communication technology and the several fields in which they might be applied. The essay dives into major inventions that have catapulted this discipline to unparalleled heights, and it spans from the historical origins to the modern accomplishments. This overview elucidates the enormous influence that satellite communication has had on modern civilization, highlighting its central position in allowing global connection, data dissemination, and transformational applications across a variety of industries.

Dziob, Krupinski, Wozniak and Gabryszewski (2020) addressed both needs by proposing a project for high school students entitled “the Colors of Earth”. The main aim for students was to distinguish between different types of land cover via the creation of various false color band compositions from the satellite Sentinel-2. Achieving this goal requires knowledge from various subjects and enables their practical application via work performed using real data. The project was presented to 39 high-school teachers and 184 high-school students (K-9 and K-10) in the summer semester of the 2019/2020 school year, and their opinions about the project were collected. Overall, both students and teachers judged the project to be interesting, worth introducing to the school, and capable of influencing student opinions of science. In addition, introducing remote sensing elements during pre-university education can help meet the demands for students and workers to study Earth observation.

Verma (2024) examined satellite communication: bridging the gap to the farthest places on earth and enhancing 911 emergency calls. Satellite communication has served as an important tool linking remote or under-served regions to the rest of the word by isolating constraints encountered in most ground-based networks. The opportunity to provide coverage and signal without interruption by geographical obstacles makes it crucial in countering the digital divide in regions that have no or weak physical infrastructures. It has a central role in managing emergency request such as the 911 emergency line and improving the existing techniques for disaster response. In this article it is explained what kind of orbits satellites classifications, how satellite signal is transmitted or received and distinctive issues in bandwidth control and satellite interference. It also focuses on the social and economical implications of satellite networks and is specifically considering their usage in healthcare, education and disaster management. Exemplifying satellite communication examples include accurate positioning for emergencies and moving persons primarily for communication during calamitous events. Moreover, a brief insight into contemporary developments in satellite communications is given in the article, ranging from Low Earth Orbit (LEO) constellations to satellite-terrestrial systems and AI-driven resource management. Detailed descriptions and calculations are made, and tables, flowcharts, and graphs are used to illustrate and compare satellite and terrestrial network performance in various situations. Finally, this article shows the critical essence of satellite communication for worldwide integration, connection, and disaster response to serve as guidance for its future and the policies and framework that needs to be in place in order to maintain its growth in the foreseeable future.

2.3. Challenges confronting the use of satellite communication devices by Nigerian undergraduates

According to Samuel (2020), Nigeria will have to contend with a lot of challenges in Satellite communication sector. Presently, the United States of America has 19 satellite stations while United Kingdom has 5. This alone

shows the level and quality of satellite communication when compare to Nigeria that has just 1 station. The challenges are as follows:

High cost of broadband: Ernest Ndukwe, a former executive chairman of Nigerian Communication Commission (NCC) regretted that Nigerians operating companies are paying relatively high bandwidth charges for satellite links in the nation, a development, he argued has discouraged the extensive use of satellite as alternative means for long distance transmission.

Lack of technological know-how: One great challenge faced by Nigeria is the high level of technological impotence. Nigeria relied on Russian and Chinese engineers for launching satellite. Dr. Chris Uwaje (the president of ISPON) in *The Nation* admitted this challenge: It is, therefore our professional opinion that our nation is faced with monumental challenge on how to structure, configure and reposition Information and Communications Technology and especially software in Nigeria as a prime industry for nation building, economic survival, national security and global competitiveness.

External influence: Africa is currently being dominated in all spheres militarily, medically and educationally to the control or near complete dominance of the communications technology space" by western powers were the words of Joe Anuga, a lecturer at the University of Jos. Which he therefore feared that if Nigerians don't take their communication destiny in their own hands, we may not be able to attain the level of independence we require as a nation.

Political influence: Most appointments into sensitive areas in the country are done not on merit but on political considerations. Communication satellite is so sensitive a venture to be politicized.

Economic challenge: Communication satellite project is a capital intensive one and needs more funds and adequate time to realize its objectives. This is also a challenge to Nigeria since she is faced with economic challenges especially in take-off and continued sustainability of critical projects.

Policy somersaults: New policies are always made by successive governments in Nigeria just to score political goals. This has also posed a critical challenge for the communication satellite sector (Samuel, 2020).

3. METHODS

3.1. Research Design

Descriptive survey research design of the survey type was adopted for this study because it is a non-experimental nature.

3.2. Population of the Study

The study population comprised undergraduates in the Department of Educational Technology, Tai Solarin University of Education, Ijagun, Ogun state.

3.3. Sampling Technique and Sample

The samples for this study are randomly selected from the total population of this study using simple random sampling technique. The total of two hundred (200) students were sampled each from the population which cut across 100 level to 400 level in the department.

3.4. Research Instrument

The research instrument used in gathering data for this study was a well-structured questionnaire.

3.5. Method of Data Analysis

The data gathered was subjected to inferential statistics (T-test, ANOVA and Multiple Regression Analysis) statistical instruments were employed to analyse the data generated at 0.05 level of significance.

4. RESULTS AND DISCUSSION

4.1. Testing of Research Hypotheses

$H0_1$: There is no significant difference in undergraduates' level of access to satellite communication devices for learning

Table 1- Regression Analysis of undergraduates' level of access to satellite communication devices for learning

Model		**R**	**R-square**	**Adjusted R square**	**Std. Error**
Access to satellite communication devices for learning		.950	0.902	0.901	0.452
Model	**Sum of square**	**Df**	**Mean Square**	**F**	**Sig**
Regression	65.319	1	82.660	95.584	.012
Residual	39.771	198	.204		
Total	65.091	199			

The result in table 1 reveals that there is significant difference in undergraduates' level of access to satellite communication devices for learning, this is shown by the value of R =.950 and R^2 (adjusted) =.901, P = .012. The table further revealed that the variable (access to satellite communication devices) was accounted to influence learning by 90.1%. However, the null hypothesis is rejected and we conclude that there is significant difference in undergraduates' level of access to satellite communication devices for learning ($p<0.05$).

$H0_2$: There is no significant difference in undergraduates' level of utilization of satellite communication devices for learning

Table 2- Regression Analysis of undergraduates' level of utilization of satellite communication devices for learning

Model		**R**	**R-square**	**Adjusted R square**	**Std. Error**
Utilization to satellite communication devices for learning		.992	0.983	0.883	0.169
Model	**Sum of square**	**Df**	**Mean Square**	**F**	**Sig**
Regression	29.734	1	64.867	54.697	.010
Residual	5.538	198	.028		
Total	35.273	199			

The result in table 2 reveals that there is significant difference in undergraduates' level of utilization of satellite communication devices for learning, this is shown by the value of R =.992 and R^2 (adjusted) =.983, P = .010. The table further revealed that the variable (utilization of satellite communication devices) are accounted to influence learning by 88.3%. However, the null hypothesis is rejected and we conclude that there is significant difference in undergraduates' level of utilization of satellite communication devices for learning ($p<0.05$).

$H0_3$: There is no significant difference in undergraduates' access to satellite communication devices for learning based on gender

Table 3- T-test Analysis of undergraduates' access to satellite communication devices for learning based on gender

Access to satellite communication devices for learning	**Mean**	**Std. Dev.**	**Std. Error**	***Df***	**t**	**Sig.**
Male	2.69	.683	.630	198	-7.340	.471
Female	2.29	.248	.744			

The result in table 3 reveals that there is no significant difference in undergraduates' access to satellite communication devices for learning based on gender ($t=-7.340$, $p>0.05$). The table further revealed that the variable (access to satellite communication devices) are accounted to influence learning. However, since $0.471 > 0.05$, the null hypothesis is accepted and we conclude that there is no significant difference in undergraduates' access to satellite communication devices for learning based on gender. However, it should be noted that the initial finding, which suggests that male students use these devices more frequently than female students, is still worth exploring. It is possible that there are other factors at play that are influencing the gender discrepancy in device

usage. This implies that male students may be more likely to have technical backgrounds or interests that make them more comfortable using satellite communication devices for learning.

H0₄: There is no significant difference in undergraduates' utilization of satellite communication devices for learning based on gender

Table 4- T-test Analysis of undergraduates' utilization of satellite communication devices for learning based on gender

Utilization to satellite communication devices for learning	**Mean**	**Std. Dev.**	**Std. Error**	***Df***	**t**	**Sig.**
Male	2.79	.953	.819			
Female	1.51	.372	.731	198	3.683	.070

The result in table 4 reveals that there is no significant difference in undergraduates' utilization of satellite communication devices for learning based on gender ($t=3.683$, $p>0.05$). The table further revealed that the variable (utilization of satellite communication devices) are accounted to influence learning However, since $0.070 > 0.05$, the null hypothesis is accepted and we conclude that there is no significant difference in undergraduates' utilization of satellite communication devices for learning based on gender. However, it should be noted that the initial finding, which suggests that male students use these devices more frequently than female students. One potential explanation for this gender gap is that male students may be more likely to have had prior experience with technology, which could make them more comfortable using satellite communication devices for learning. This could be due to differences in societal expectations and gender roles, which may lead to male students being more likely to engage in technology-related hobbies or activities outside of the classroom.

H0₅: There is no significant influence of satellite communication devices on undergraduates' academic performance

Table 5- Multiple regression for hypothesis five

Model		**R**	**R-square**	**Adjusted R square**	**Std. Error**
Influence of satellite communication devices on undergraduates' academic performance		0.216	0.067	0.044	0.048783
Model	**Sum of square**	**Df**	**Mean Square**	**F**	**Sig**
Regression	3.704	1	3.704	65.568	0.011^{ab}
Residual	75.683	398	0.238		
Total	79.388	399			

The result in table 5 reveals that satellite communication devices significantly predict undergraduates' academic performance. The table further revealed that the R square value of 0.047, adjusted R square of 0.044 were obtained as multiple regression coefficients. This implies that the independent variables (satellite communication devices) are jointly accounted for 67% (R square= 0.067). Since $0.00 < 0.05$, the null hypothesis is rejected and we conclude that there is significant influence of satellite communication devices on undergraduates' academic performance.

(a) Discussion of Results

Research hypothesis one revealed that there is significant difference in undergraduates' level of access to satellite communication devices for learning, also, the variable (access to satellite communication devices) are accounted to influence learning by 27.9%. This finding is consistent with the study of Anele, Onyebuchi and Obayi (2019) who noted that in the computer age compared to the conventional age of chalk and board, computer technologies such as the internet, television, radio, etc are currently adopted for teaching and learning as they provide fast and accurate feedback to students.

Research hypothesis two revealed that there is significant difference in undergraduates' level of utilization of satellite communication devices for learning, also, the variable (utilization of satellite communication devices) are accounted to influence learning by 71.0%. This is consistent with this assertion: People may be consuming media programmes without noticing that they are expressly being educated. This does not take away the educational function from the media. This is why Nworgu (2021) argued that the broadcast media play the same roles school play as agent of education because schools are formal places for education As a means of mass communication, the media plays an important role in societal transformation (Thompson, 2018) as it possesses the power to alter

behaviour. In Nigeria like most parts of the world, students are categorized as the mass media users who cannot avoid the impact of media, especially on the impact of cognitive, effective and behaviour (Wahab, Othman & Muhammad, 2017).

Research hypothesis three revealed that there is no significant difference in undergraduates' access to satellite communication devices for learning based on gender, also, the variable (access to satellite communication devices) are accounted to influence learning by 1.7%. This is not in line with the study of Schultz and Anderson (2021), reflecting on the research conducted on gender and communication, state that "differences between male and female undergraduates' perceptions, language usage, values, realities, commonplaces, and responses emerge as a consistent finding". Although a wide range of terms have been used to categorize the distinctions between male and female students' communication.

Research hypothesis four revealed that there is no significant difference in undergraduates' utilization of satellite communication devices for learning based on gender, also, the variable (utilization of satellite communication devices) are accounted to influence learning by 13.7%. As Wood (2021) explains, boys' development begins in differentiation and girls' development begins in relatedness. It is believed that these early experiences are later reinforced by society that rewards boys' achievement and participation in individually-oriented, competitive activities and praises girls' involvement in cooperative relationships (Eagly & Crowley, 2021; Eccles, Jacobs, & Harold, 2020). Thus, females are socialized to adopt an expressive orientation that emphasizes social integration whereas males are directed toward an instrumental orientation that focuses on accomplishing goals (Gill *et al*., 2017).

Research hypothesis five revealed that there is significant influence of satellite communication devices on undergraduates' academic performance. This finding is in tandem with the study of Irene (2019) who found that televiewing has positive effect on students' academic performance. However, the finding is contrary to the findings of Syed (2018) revealed that low television viewer students exhibit a higher scholastic achievement than the heavy TV viewer group of students.

5. CONCLUSION

In conclusion, not all students have the same opportunity to own or use these devices. Some students may have better access due to their financial background, location, or institutional support, while others may lack access due to limited resources or poor infrastructure. While some students use these devices regularly to attend online classes, download materials, or interact with lecturers, others do not use them much or only use them for non-academic purposes. However, the initial patterns indicate that male students tend to use these devices more frequently. This might be due to social or cultural reasons where males are encouraged to use technology more than females, or they may have more exposure to tech-based tools outside school. Students who use these devices effectively are likely to perform better in their studies. This is because satellite communication makes it easier for them to learn beyond the classroom, access up-to-date content, and connect with their peers and lecturers. Thus, access and proper use of satellite communication devices can positively affect students' learning outcomes

6. RECOMMENDATIONS

In view of the findings, the following recommendations were suggested:

- It is therefore strongly recommended that schools should provide shared satellite communication devices in libraries or ICT centers so that students with low personal access can also benefit.
- Government and stakeholders should partner to subsidize the cost of satellite internet or devices for undergraduates in low-income areas.
- Universities should organize workshops or training to help students learn how to use satellite tools effectively for academic purposes.
- Lecturers should include satellite-based tools and platforms in their teaching to encourage regular student engagement.
- Female students should be encouraged through mentorship programs to explore and engage more with technology for academic growth.
- Schools should identify and remove any cultural or institutional barriers that discourage female students from accessing satellite devices.
- Institutions should design inclusive technology training programs that consider the learning styles and backgrounds of both male and female students.
- Clubs or societies that promote tech literacy among female students should be supported and expanded on campuses.
- Educators should integrate satellite communication tools into classroom learning and assignments to improve student performance.

- Educational policymakers should recognize satellite devices as essential learning tools and include them in digital learning policies.

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