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Influence of Computer Literacy on Academic Performance of Undergraduates in Tertiary Institution in Nigeria

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ABSTRACT

This paper examined the impact of computer literacy on the academic performance of undergraduates in Nigerian tertiary institutions. It adopted correlational and descriptive survey research methods where a sample of 300 undergraduates was chosen as respondents for the study. Data were gathered through the use of a structured questionnaire designed by the researcher. The results revealed a positive relationship between computer literacy skills and the academic performance of undergraduates which meant that greater digital expertise leads to better academic performance. In addition, the paper pointed to the significant role of access to computer facilities in academic performance, with consistent connection and operational computers seen to be essential on the part of students. Although the institutional facilities were mostly considered satisfactory, the adequacy of the computer laboratories offered within campuses as per their capacity to deliver support to the completion of assignments, in a timely manner, was questioned. The research concluded that computer literacy is one of the core requirements of academic excellence in higher institutions in Nigeria. It suggested that the tertiary institutes should establish well defined computer literacy programmes, and consider initiatives to subsidize Internet connectivity and computer devices for students.

Keywords: *Computer literacy; literacy skills; academic performance; technology*

INTRODUCTION

The fast technological changes that have taken place during the last several decades have inevitably redefined some of the areas of human life, education being one of them (Adeyemi, 2019). It has become more common to equip the learning setting with computers and digital tools; thus, the computer literacy issue has become a rising priority (Omotayo & Olajide, 2020). Computer literacy, which can be described as the proficiency in utilizing computers and the associated technology effectively, has become a very fundamental requirement in a wide variety of academic and occupational domains that previously were not considered the domain of computer literacy (Adeyemi, 2019). The use of computers in Nigerian tertiary institutions is gradually increasing as well as the general expectation of computers digital acumen in graduates. The stylistic changes hint to the fact that the framework of computer literacy as an independent variable becomes more and more pertinent to the academic experience of students.

Grade point average, examination scores, and passing courses all refer to the academic performance of undergraduate which is a construct that has been traditionally affected by factors like teaching methodologies, student effort and access to resources (Bello & Musa, 2021). Nevertheless, the presence of digital competencies in the modern educational context cannot be neglected. High computer literacy may enable students to use online learning materials, work with educational programmes, carry out research, and even engage in remote joint work, which would help improve their academic performance (Eze & Okoro, 2022). On the other hand, the inability to read and write on computers could limit the students to fully indulge in computerised learning systems and could create a drawback in their academic careers. As an example, students with limited knowledge and skills of learning to navigate online platforms where they should submit their

assignments and those who cannot work with word processors effectively may lag behind, regardless of their natal intellectual abilities (Olusanya, 2018). The relationship between computer literacy and academic performance is consequently assumed to be positive and strong, and developed digital literacy skills can possibly lead to the more productive and more economical learning progress.

Although, most tertiary institutions in Nigeria are working hard to incorporate technology in their teaching curriculum and give students access to computers, there is anecdotal evidence and initial observation, also, that there seems to be an apparent disjunction in the level of computer literacy among undergraduates. The reason for this could be the differences in the background related to secondary education, the lack of access to personal computers, and the underrepresentation of the training opportunities in them, within tertiary institutions. The issue hence is the possibility of poor computer literacy among undergraduates in tertiary institutions in Nigeria adversely affecting their academic performance. This is of special concern due to the growing demand to use digital platforms in learning, research, and assessment. An absence of basic knowledge and experience of computer skills may make them unable to take full advantage of available resources, complete school work in a timely manner, or perhaps, even have access to absolutely essential course related information, thus leading to possible low performance in their studies.

This study is justified in a number of ways. To begin with, knowing the effect of computer literacy on academic achievement will help with making policy decisions on curricula development and deployment of technological infrastructure in Nigerian tertiary institutions. In case there is a positive relationship, it will highlight the importance of including full-fledged computer literacy-building activities into orientation programs or as a mandatory class that all undergraduates will have to take (Idris & Abubakar, 2023). Second, the results have the potential to help the educators channel their teaching based on the level of computer literacy of the students, possibly through remedial measures or advanced but gradationally deepening assignments. Thirdly, among the students themselves, the realization of the relevance of computer literacy could inspire them to independently pursue the means of skill formation, thus improving their academic prospects and ability to acquire gainful employment in what is becoming an ever more digitalized world (Akinyemi, 2024). Finally, the research aims at providing empirical findings to buttress the popular trend that computer literacy has ceased to be a luxury item but a very basic requirement of academic achievement in modern higher education in Nigeria.

OBJECTIVES OF THE STUDY

The main objective of this study is to investigate the influence of computer literacy on the academic performance of undergraduates in tertiary institutions in Nigeria. Specifically, the study aims to:

1. Ascertain the current level of computer literacy among undergraduates in Nigerian tertiary institution.
2. Determine the relationship between computer literacy skills and the academic performance of undergraduates in Nigerian tertiary institution.
3. Examine the extent to which access to computer facilities influences the academic performance of undergraduates in Nigerian tertiary institution.
4. Identify the challenges faced by undergraduates in acquiring and utilizing computer literacy skills.

RESEARCH QUESTIONS

Based on the objectives of the study, the following research questions will guide the study:

1. What is the current level of computer literacy among undergraduates in Nigerian tertiary institution?
2. Is there a relationship between computer literacy skills and the academic performance of undergraduates in Nigerian tertiary institution?
3. To what extent does access to computer facilities influence the academic performance of undergraduates in Nigerian tertiary institution?
4. What are the challenges faced by undergraduates in acquiring and utilizing computer literacy skills?

HYPOTHESES

The following null hypotheses are formulated for the study:

1. There is no significant relationship between the level of computer literacy and the academic performance of undergraduates in Nigerian tertiary institution.
2. There is no significant influence of computer literacy skills on the academic performance of undergraduates in Nigerian tertiary institution.

METHODOLOGY

This study applied correlational and descriptive survey research designs. Correlational research design is suitable since it lists the existing picture of computer literacy among undergraduates and establishes the nature and magnitude of the relationship between computer literacy and academic performance without controlling any variable (Adeyemi, 2019; Eze & Okoro, 2022). A survey method also provides the opportunity to gather data on a larger number of people and obtain a comprehensive picture of the phenomena to be studied and to extrapolate the results to the total population (Eze & Okoro, 2022). This study was based on the population of all undergraduates in the University of Offa, Offa in Kwara State in Nigeria. A sample of the study was taken using simple random sampling methods where three hundred (300) undergraduate students of the University of Offa, Offa, Kwara State were selected as the study sample. The research instrument used for data collection was a structured questionnaire, divided into sections corresponding to the study's objectives and research questions. Pilot study involving a sample of 30 undergraduates of a tertiary institution that did not form part of main sample was carried out. This was done on two occasions within two weeks to a group of these students and they completed the questionnaire twice. The correlation coefficient (Pearson's r) between the scores from the two administrations was calculated. The reliability coefficient of 0.89 was acquired, which is regarded as highly reliable (Eze & Okoro, 2022). Both descriptive and inferential statistics were used to analyse collected data with the help of the Statistical Package for the Social Sciences (SPSS) software. The research questions were answered using frequency counts and means whereas the null hypotheses were tested using Pearson Product Moment Correlation Coefficient at 0.05 level of significance.

RESULTS

Answering Research Questions

Research Question 1: What is the current level of computer literacy among undergraduates in Nigerian tertiary institution?

The results are shown in Table 1 below, according to participant responses – Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Table 1: *Current level of computer literacy among undergraduates in Nigerian tertiary institution*

S/N	Items	SA	A	D	SD	Mean	Remarks
1	I can confidently use word processing software (e.g. Microsoft Word, Google Docs) to create, edit, and format academic papers.	75	63	51	111	2.34	Disagreed
2	I am highly skilled at navigating the Internet to find relevant academic resources and information for my studies	159	105	27	9	3.38	Agreed
3	I am proficient in using presentation software (e.g. Microsoft PowerPoint, Google Slides) to create professional academic presentations	66	57	72	105	2.28	Disagreed
4	I am comfortable using specific software applications relevant to my field of study (e.g. statistical software, design software)	18	6	129	147	1.65	Disagreed
5	I am capable of effectively using email and online learning platforms (e.g. Moodle, Google Classroom) for academic communication and course engagement	153	117	21	9	3.38	Agreed
	Weighted Average					**2.61**	

Decision Rule: 0 – 2.49 = low, 2.50 – 4.00 = high

The data in Table 1 shows that the majority of the respondents agreed that; they are highly skilled at navigating the Internet to find relevant academic resources and information for their studies (mean = 3.38), they are capable of effectively using email and online learning platforms (e.g. Moodle, Google Classroom) for academic communication and course engagement (mean = 3.38). However, majority of the respondents disagreed that; they can confidently use word processing software (e.g. Microsoft Word, Google Docs) to create, edit, and format academic papers (mean = 2.34), they are proficient in using presentation software (e.g. Microsoft PowerPoint, Google Slides) to create professional academic presentations (mean = 2.38), they are comfortable using specific software applications relevant to their field of study (e.g. statistical software, design software) (mean = 1.65). Meanwhile, based on the value of the weighted average (2.61 out of 4.00 maximum value that can be obtained), which falls within the decision value for **high**, it can be inferred that, there is a high level of computer literacy among undergraduates in Nigerian tertiary institution.

Research Question 2: Is there a relationship between computer literacy skills and the academic performance of undergraduates in Nigerian tertiary institution?

The results are shown in Table 2 below, according to participant responses – Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Table 2: *Relationship between computer literacy skills and the academic performance of undergraduates in Nigerian tertiary institution*

S/N	Items	SA	A	D	SD	Mean	Remarks
1	My ability to use word processing software effectively helps me submit well-structured and presentable assignments, which positively impacts my grades	72	60	96	72	2.44	Disagreed
2	My proficiency in Internet navigation significantly improves my ability to conduct research, leading to better quality academic work	84	108	90	18	2.98	Agreed
3	Being able to utilise various software applications (e.g. for data analysis, simulations) makes it easier for me to understand complex course concepts and excel in my studies	66	63	93	78	2.39	Disagreed
4	My overall computer literacy skills enable me to complete academic tasks more efficiently, giving me more time to focus on understanding course materials	87	75	72	66	2.53	Agreed
5	I believe that my computer literacy directly contributes to my ability to achieve higher grades in my courses	153	117	21	9	3.38	Agreed
	Weighted Average					**2.74**	

Decision Rule: 0 – 2.49 = negative, 2.50 – 4.00 = positive

The data in Table 2 reveals that the majority of the respondents agreed that; their proficiency in Internet navigation significantly improves their ability to conduct research, leading to better quality academic work (mean = 2.98), their overall computer literacy skills enable them to complete academic tasks more efficiently, giving them more time to focus on understanding course materials (mean = 2.53), they believe that their computer literacy directly contributes to their ability to achieve higher grades in their courses (mean = 3.38). However, the majority of the respondents disagreed that; their ability to use word processing software effectively helps them submit well-structured and presentable assignments, which positively impacts their grades (mean = 2.44), being able to utilise various software applications (e.g. for data analysis, simulations) makes it easier for them to understand complex course concepts and excel in their studies (mean = 2.39). Meanwhile, based on the value of the weighted average (2.74 out of 4.00 maximum value that can be obtained), which falls within the decision value for **positive**, it can be inferred that, there is a positive relationship between computer literacy skills and the academic performance of undergraduates in Nigerian tertiary institution.

Research Question 3: To what extent does access to computer facilities influence the academic performance of undergraduates in Nigerian tertiary institution?

The results are shown in Table 3 below, according to participant responses – Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Table 3: *Extent to which access to computer facilities influence the academic performance of undergraduates in Nigerian tertiary institution*

S/N	Items	SA	A	D	SD	Mean	Remarks
1	Sufficient access to computer laboratories on campus significantly helps me complete my assignments and projects on time	57	66	105	72	2.36	Disagreed
2	The availability of reliable Internet access within the school premises (e.g. WiFi, computer labs) is crucial for my academic success	177	96	15	12	3.46	Agreed
3	Limited access to functional computers and Internet facilities at my institution negatively affects my ability to conduct research for my courses	141	144	15	0	3.42	Agreed
4	The quality and up-to-date computer facilities provided by my institution are adequate for my academic needs	225	75	0	0	3.75	Agreed
5	My access to personal computing devices (e.g. laptop, smartphone) at home supplements the institutional facilities and positively influences my academic work	75	111	81	33	2.76	Agreed
	Weighted Average					**3.15**	

Decision Rule: 0 – 2.49 = low, 2.50 – 4.00 = high

The data in Table 3 shows that the majority of the respondents agreed that; the availability of reliable Internet access within the school premises (e.g. Wi-Fi, computer labs) is crucial for their academic success (mean = 3.46), limited access to functional computers and Internet facilities at their institution negatively affects their ability to conduct research for their courses (mean = 3.42), the quality and up-to-date computer facilities provided by their institution are adequate for their academic needs (mean = 3.75), their access to personal computing devices (e.g. laptop, smartphone) at home supplements the institutional facilities and positively influences their academic work (mean = 2.76). However, the majority of the respondents disagreed that; sufficient access to computer laboratories on campus significantly helps them complete their assignments and projects on time (mean = 2.36). Meanwhile, based on the value of the weighted average (3.15 out of 4.00 maximum value that can be obtained), which falls within the decision value for **high**, it can be inferred that, there is a high extent to which access to computer facilities influences the academic performance of undergraduates in Nigerian tertiary institution.

Research Question 4: What are the challenges faced by undergraduates in acquiring and utilizing computer literacy skills?

The results are shown in Table 4 below, according to participant responses – Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Table 4: *Challenges faced by undergraduates in acquiring and utilizing computer literacy skills*

S/N	Items	SA	A	D	SD	Mean	Remarks
1	Poor computer literacy skills before gaining admission into tertiary institution limits my ability to carry out online research and make use of digital tools for my academics	72	156	60	12	2.96	Agreed
2	Frequent power outages and unreliable electricity supply hinder my ability to practice and utilise computer skills effectively	90	96	96	24	2.88	Agreed
3	The computer literacy programmes or courses offered by my institution are insufficient to meet my learning needs	96	93	90	21	2.88	Agreed
4	I find it challenging to get timely technical support when I encounter computer-related issues while doing my academic work	30	132	105	36	2.54	Agreed
5	The high cost of accessing Internet services outside of the institution's premises limits my ability to improve my online research and digital skills	72	120	96	12	2.84	Agreed

Cut-off Point = 2.50

The data in Table 4 with a cut-off mean point of 2.50, reveals that the majority of the respondents agreed that; poor computer literacy skills before gaining admission into tertiary institution limits their ability to carry out online research and make use of digital tools for academics (mean = 2.96), frequent power outages and unreliable electricity supply hinder their ability to practice and utilise computer skills effectively (mean = 2.88), the computer literacy programmes or courses offered by the institution are insufficient to meet learning needs (mean = 2.88), it is challenging to get timely technical support when they encounter computer-related issues while doing academic work (mean = 2.54), the high cost of accessing Internet services outside of the institution's premises limits my ability to improve online research and digital skills (mean = 2.84).

Hypotheses Testing

HO_1: There is no significant relationship between the level of computer literacy and the academic performance of undergraduates in Nigerian tertiary institution.

The Pearson Correlation Coefficients for the relationship between the level of computer literacy and academic performance are shown in Table 5 below.

Table 5: *Pearson Product Moment Correlation Coefficient of the relationship between the level of computer literacy and the academic performance of undergraduates in Nigerian tertiary institution*

		Level of computer literacy	Academic performance
Level of computer literacy	Pearson Correlation		.792**
	Sig. (2-tailed)		.000
	N		300
Academic performance	Pearson Correlation	.792**	
	Sig. (2-tailed)	.000	
	N	300	

The results in Table 5 show that, there is a significant positive relationship between the level of computer literacy and the academic performance of undergraduates in Nigerian tertiary institutions ($r = 0.792$, $N = 300$, sig. $= 0.000$, $p < 0.05$). Hence, the higher level of computer literacy leads to higher academic performance of undergraduates.

HO_2: There is no significant influence of computer literacy skills on the academic performance of undergraduates in Nigerian tertiary institution.

The Pearson Correlation Coefficients for influence of computer literacy skills on academic performance are shown in Table 6 below.

Table 6: *Pearson Product Moment Correlation Coefficient of the significant influence of computer literacy skills on the academic performance of undergraduates in Nigerian tertiary institution*

		Computer literacy skills	Academic performance
Computer literacy skills	Pearson Correlation		.689**
	Sig. (2-tailed)		.000
	N		300
Academic performance	Pearson Correlation	.689**	
	Sig. (2-tailed)	.000	
	N	300	

The results in Table 6 show that, there is a significant positive influence of computer literacy skills on the academic performance of undergraduates in Nigerian tertiary institution ($r = 0.689$, $N = 300$, sig. $= 0.000$, $p < 0.05$). Hence, higher computer literacy skills among undergraduates positively influence their academic performance.

DISCUSSION OF FINDINGS

The results established that undergraduates in Nigerian tertiary institutions have mixed but generally high levels of computer literacy. Although the students tend to demonstrate an impressive performance in the most typical online operations, such as accessing the Internet and using email,

and educational Internet sites to communicate and study, a distinctive lack of performance when it comes to basic and practices-oriented software is observed. In particular, most students lack the confidence to use the word processing and presentation software to design and format scholarly reports and presentations. Moreover, many of them feel uncomfortable working with special software related to their corresponding study areas. Although there are these particular areas of weakness, the general evaluation leads to the assumption regarding the high digital competence level, which is mainly determined by the fact that their ability to deal with online tasks and Internet-based communication is high. This result coincides with the findings by Bankole (2020), and GetBundi (2024) which indicates that Nigerian students enrolled in colleges and universities are quite competent in using and sharing information online, but they still need to be trained in creation and manipulation of information using the most popular and commonly used office and specialized applications. This gap more frequently indicates problems of curriculum, how such skills can be translated into practice in the education system.

Furthermore, the findings of the study revealed that there is a positive relationship between computer literacy and academic performance of undergraduates. In particular, students generally accept that good Internet navigation would boost their research abilities such that their efforts in terms of academic output increases. They understand that effective use of computers can shorten task completion time and this can mean greater interaction with the course materials. Moreover, students believe strongly that when they are more computer literate, chances are that they will score higher. But there seems to be a gap between the influence of word processing capability over the presentation of assignments together with grades, and the strength of special software application to comprehend complex ideas and perform well in their studies. This coincides with the results of past studies, with such researchers as Eze & Okoro (2022) pointing out the importance of information and communication technology to the promotion of academic products achieved by undergraduate students. On the same note, Akinyemi (2024) put special emphasis on digital skills acquisition as the factor promoting academic success, supporting the message that being more skilled at using digital devices can support better academic performance.

The results indicated that undergraduates in the tertiary institutions in Nigeria largely hold the view that access to computer facilities will greatly influence their academic performance. The students confirmed that they need stable Internet connection on campus, and defective computers and lack of Internet access have adverse impacts on their research capabilities. While personal computing devices at home are seen as beneficial supplements, there is a notable sentiment that on-campus computer laboratories aren't sufficiently helping them complete assignments on time. The general view of a high degree of influence is consistent with that expressed by earlier research including Eze & Okoro (2022), Idris & Abubakar (2023), Olusanya (2018), and Akinyemi (2024) which alluded to the essential importance of a powerful digital infrastructure in facilitating student learning outcomes.

The results of the study also showed that there are a number of dire challenges toward achieving and engaging computer literacy skills in the Nigerian tertiary institutions, which undergraduates have to overcome. The first obstacle is that today many students have few computer literacy skills even before they get to the university, and this fact also limits their capacity to research online and employ the use of an online tool in their studies. Further, the unreliable electricity supply and frequent power outages consistently impede students' opportunities to practice and use their computer skills. Most of the students also believe that computer literacy programs in their institutions are poorly designed to suit their education requirements. This is because in case of computer-related problems, students end up struggling to get immediate assistance and technical help. Lastly, the high cost of Internet access outside of the institution's premises poses a notable barrier to improving their online research and digital competencies. Such findings are closely connected with the available literature, as Olusanya (2018) has already mentioned different barriers, namely infrastructural gaps that do not allow proper computer utilization among Nigerian

undergraduates. Likewise, Idris & Abubakar (2023) have underlined the necessity of delivering the full range of computer literacy education since there is a possibility that the existing provisions are actually limited as understood by the students. The challenges mentioned here are, by and large, the same problems highlighted by Eze & Okoro (2022) when discussing the overall significance of information and communication technology in the Nigerian academic institution setting, confirming the importance of developing computer literacy as much through a favourable environment as through the provision of the hardware needed.

The results indicated that the level of computer literacy of undergraduates has a positive and strong relation to an understanding of the student-academic performance within the Nigerian tertiary institutions. This indicates that as students' computer literacy skills improve, their academic achievements tend to rise concurrently. Better performance in their studies is usually achieved by undergraduates who are more skilful in the use of computers and other related technological tools. The finding corresponds to the current literature that brings to the fore that digital skills are increasingly becoming important in the modern educational arena. At that, when approaching the problem of computer literacy skills in Nigerian undergraduates, Omotayo & Olajide (2020) emphasized that this particular asset is remarkably helpful, which begs the assumption that it has a positive connection to the overall academic activity among undergraduates and graduates. In a similar case, Adeyemi (2019) highlighted how computer literacy positively influenced the education of students in Nigerian universities, confirming the notion that the literacy level in digital tools promotes good grades. Furthermore, Eze & Okoro (2022) contended that information and communication technology, which includes computer literacy, plays a crucial role in enhancing undergraduate academic performance, aligning with the present study's observation that greater digital competence is associated with stronger academic results.

The results of the study revealed a high tendency that the degree of computer literacy amongst undergraduates in Nigerian tertiary institutions plays a significant role in influencing the academic performance of the undergraduates positively. This implies that as students' proficiency in using computers and related technologies increases, their academic outcomes tend to improve concurrently. This result can be compared to previous studies which have highlighted the changing role of digital competencies in education. As an example, Adeyemi (2019) accentuated the importance of computer literacy on the learning of students by indicating that the higher their digital skills, the better the opportunity to meet academic requirements. Likewise, Omotayo & Olajide (2020) also emphasized the necessity of computer literacy skills as well as their application in undergraduate students that, in turn, is directly connected to the capacity of students to operate with learning materials and tasks. In addition, Eze & Okoro (2022) confirmed the essential role of information and communication technology in improving the academic performance of undergraduates, and computer literacy as an irreplaceable element. The existence of these strong positive relationships affirms the modern perspective of digital skills ceasing to be a supplementary skill in its direction towards becoming the enabling establishment of academic excellence in post-secondary education as also substantiated by Akinyemi (2024), who opined that the process of acquiring digital skills ought to be regarded as a sure means of attaining academic excellence in higher education.

CONCLUSION AND RECOMMENDATIONS

In this research, computer literacy skills were found to have a positive impact by improving the academic performance of undergraduates to a considerable extent with no exceptions. This implies that the better students who improve on their skills on how to operate computers and other related software, are likely to perform academically. Moreover, the research found that the availability of computer facilities has a significant influence on the academic performance, and students mostly shared the importance of a stable and quality Internet connection and working computers as the means of studying and researching. Although institutional computer facilities were generally viewed

as sufficient, there was the question of adequacy that was raised in terms of on-campus computer laboratories that were deemed sufficient enough so that it is possible to complete assignments in a sufficient amount of time. Finally, the study identified several issues encountered by the undergraduates in regard to possession and application of computer literacy skills such as the prohibitive cost of personal devices and data, erratic power supply and inadequate training at the institutions. Computer literacy has therefore become an essential tool rather than an added-on feature to academic life in Nigerian institutions of higher learning where it now forms a major component in the success pathway of higher education, being dependent on regular access and proper usage of online resources.

In line with the findings of this study, the researcher proffers the following recommendations as a sequel to promoting computer literacy and, therefore improving academic performance among undergraduates within the Nigerian tertiary institutions:

1. Tertiary institutions should think of establishing mandatory computer literacy programmes among all first-year undergraduates in the institutions or incorporate intensive training on digital skills during orientation.
2. Tertiary institutions should make it a first priority to ensure that they have properly installed computer laboratories with a reliable and advanced Internet connection. Regular maintenance and upgrading of hardware and software are crucial to ensure facilities are up-to-date and adequate for students' academic needs.
3. Considering that lack of reliable electricity is a very huge challenge, tertiary institutions must invest in an alternative and sustainable source of power (e.g. solar power, strong generators) in computer laboratories and campus-wide Internet infrastructure so that the digital learning resources will also be available with no disruptions.
4. The policy of the government and different institutions should also see an effort to bring down Internet data charges for students and on personal computing equipment (e.g. laptops, tablets) to within their reach. The digital divide might be addressed by collaborating with a smartphone or other device manufacturers or telecommunication companies to provide many undergraduates with the necessary equipment.
5. Tertiary institutions should put in place easily accessible and effective technical support facilities in computer laboratories and online learning opportunities. This would enable the students to address technical problems in a quicker manner minimizing the level of frustration and maximizing on the learning time.
6. Lecturers and faculty members need to be supported and trained to incorporate different digital tools and online tools in the teaching process. This will not only render learning more dynamic but will also demand and create the need for computer literacy skills acquisition amongst students.

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