

American Journal of Online and Distance Learning (AJODL)



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Article history

Submitted 11.01.2024 Revised Version Received 15.02.2024 Accepted 19.03.2024

Abstract

Purpose: The advent of the COVID-19 pandemic significantly disrupted traditional modes of education delivery, leading to concerns about students' poor academic performance in Cameroon state universities. This study examines "E-learning and its effects on students' performances in Cameroonian state universities." The research questions focus on the extent to which e-notes, e-assignment, e-collaboration, and video conferencing affect students' performance.

Materials and Methods: The study adopted a descriptive survey design and employed a quantitative approach to collect and analyze data. A sample size of 310 master's students from the Faculty of Education in the University of Yaoundé 1 and University of Buea was selected through simple random probability sampling. The instrument for data collection adopted in this study was a structured questionnaire. Data was presented using tables and frequencies.

Findings: The findings of the study on the effects of e-learning components, including e-notes, e-collaboration, e-assignments, and video conferencing, suggest positive impacts on students' performances. E-notes and lectures provided easy access to course materials and contributed to students' understanding, although some students still preferred traditional

handwritten notes. E-collaboration enhanced learning experiences by promoting knowledge sharing and critical thinking, but challenges such as unequal participation and a preference for physical collaboration need to be addressed. While e-assignments facilitated timely submissions, most students did not believe they improved their performance compared to traditional methods, emphasizing the importance of effective feedback. Video conferencing-maintained classroom community and interaction, positively influencing students' attitudes, although its effect on academic performance was relatively low.

Implications to Theory, Practice and Policy: The study recommends that educators and policymakers in Cameroon should design e-learning courses that are engaging and interactive, and provide support to students to ensure they are able to succeed in online environments. A balanced approach accommodating diverse learning preferences is also recommended, along with promoting effective e-collaboration practices and providing constructive feedback.

Keywords: *E-Learning, E-Notes, E-Collaboration, E-Assignment, Video Conferences, Students, State, Universities*

1.0 INTRODUCTION

Traditional learning was a very popular method of learning in the world up until the 2000s. With the advent of the internet, many educational systems have replaced traditional learning with e-learning. Specifically, during the COVID 19 pandemic, schooling in higher education institutions in many parts of Cameroon was interrupted while different modes of learning were embraced with some schools adopting different methods of learning to enhance learning out of the classroom (Noah & Gbemisola, 2020). Educational institutions had to search for innovative digital tools that could be used in the continuation and improvement of learning and performance. Several schools adopted digital technologies such as Google classroom, WhatsApp groups, emails, and others.

The integration of e-learning into the higher education system has been acknowledged by the government of Cameroon as a potential solution to the challenges faced by the system. In the Education and training strategy document (2013-2020), one of the solutions to the Cameroonian Education system challenges was to expand the use of ICT in education and training by;

- i. Encouraging new opportunities and new training tools such as e-learning, distance learning, tutorials, and many others.
- ii. Improving the learning environment in schools.
- iii. Enhance the capacity of teachers and support staff to use computer tools and digital teaching resources.

Other actions put in place to promote the integration of ICT in Cameroonian universities include:

An implementation framework agreement with the technical and financial support of the People's Republic of China signed on June 18, 2015 in Beijing the Cameroonian and Chinese governments. This was done in an attempt to ensure the digital transformation of Cameroonian universities in conformation with futuristic project: E-National Higher Education Network. This New Governance Policy implemented by the Government, aimed on the one hand to give a better cybernetic visibility to the Cameroonian universities and, on the other hand to allow the appropriation and the generalization of the new modes of teaching and learning based on the ICTE (E-Learning). The E-National Higher Education Network project is the first phase of the process of building the Digital University of Cameroon. Its purpose is: a) the establishment in State Universities of high-performance material (computer and telecommunications networks, data centres) and immaterial (e-administration and e-learning) infrastructures, b) the facilitation of student access to digital terminals and, c) the development of skills essential to the digital transformation of the Cameroonian University. (MINESUP, 2020).

In 2016, the President of the Republic of Cameroon donated 500,000 computers to students in both state and private universities as part of the e-National Higher Education Network project. Also, State universities in Cameroon have established computer and technology centers that provide students with easy access to the internet for research and study purposes. In addition, some universities have implemented learning management systems and virtual learning environments to facilitate online learning and enhance the learning experience of students. (Patterson Nji Mbakwa, 2019).

Following the outbreak of COVID-19 Pandemic, several measures were initiated by the Cameroon government such as the use of distance learning platforms, TV/ radio and communication tools.

Distance teaching and learning tools were adopted to compensate for the cessation of “Live” teaching by the MINEDUB, MINESEC, and MINESUP. (Beche, 2020)

The Ministry of Higher Education and the Cameroon Telecommunication Corporation, CAMTEL signed a partnership agreement on September 8, 2020, in Yaoundé, for the provision of bandwidth high enough to interconnect state universities and the Congo-Cameroon Inter-State University of Sangmelima. (CRTV, 2020; Business in Cameroon, 2020) This framework agreement aimed at providing electronic communications services to state universities. For the MINESUP, this agreement was another step taken towards the "E-National Higher Education" project. (Business in Cameroon, 2020)

Despite the efforts to integrate e-learning into the higher education system in Cameroon, there are still challenges such as limited internet access and bandwidth, inadequate infrastructure, and limited resources for training and support. However, with the increasing demand for higher education and the potential of e-learning to provide flexible and accessible education, the use of e-learning is expected to continue to grow in Cameroon's higher education system. Worthy of note in the fact that Cameroon educational system is experiencing an unprecedented increase in students enrolment, few or poor infrastructural development, brain drain amongst other challenges.

Problem and Purpose of Study

The issue of students' poor academic performance in Cameroon has raised significant concerns among the government, parents, and educational institutions' administration. In higher education, ensuring optimal academic performance among students is crucial for their personal growth, institutional success, and societal progress. However, the advent of the COVID-19 pandemic posed significant challenges to the traditional modes of education delivery, leading to a decline in student performance within state universities in Cameroon. This does not only affect the students themselves but also affects educational institutions and broader society as well. Ideally, universities would employ effective measures and strategies to enhance student academic performance. This includes proactive administrative initiatives that prioritize student support, innovative pedagogical approaches, and efficient learning management systems to facilitate the educational journey. By implementing such measures, universities can foster an environment conducive to improved student outcomes.

Yet, the reality of the situation reveals a significant disparity especially in the wake of the COVID-19 crisis. The pandemic has disrupted traditional teaching methods, resulting in a notable decline in student engagement, motivation, and learning outcomes. Students with poor academic performance may encounter reduced opportunities for personal growth, limited access to employment prospects, and low self-confidence. At the institutional level, declining student performance affects the reputation and quality of education provided by universities, leading to potential decreases in enrollment and funding. Moreover, society as a whole suffers because when students don't do well, it can slow down progress and development. Among other factors, experiences undergone in the current dispensation of COVID-19 crisis has demonstrated that the challenges in direct, traditional instruction is causing a decline in student academic performance. What then could be an alternative approach in enhancing students learning? The study therefore proposes the use of e-learning and sets to examine the effects of e-learning on student performance within state universities in Cameroon. By investigating the impact of e-learning methods and strategies on academic outcomes, this research aims to provide valuable insights and

recommendations to enhance student performance, inform policy decisions, and foster a more resilient and effective educational system in the face of future challenges.

Therefore, the main research question is “What is the effect of E-learning on students’ performance in Cameroon state universities?”

These have been broken down to specific questions as follows:

- To what extent can e- notes affect students’ performance?
- What effect does e- assignment have on students’ performance?
- What is the effect of e- collaboration on students’ performance?
- In what ways can video conferencing affect students’ performance?

Specific Research Hypothesis Are

H₀₁: E-notes and lectures do not significantly affect students’ performance.

H₀₂: E-assignment does not significantly affect students’ performance.

H₀₃: E-collaboration does not significantly affect students’ performance.

H₀₄: Video conferencing does not have an effect on students’ performance.

Conceptual Review

Student Performance

Student performance is a crucial determinant of the success or failure of an academic institution, as emphasized by Narad and Abdullah (2016). They define academic performance as the knowledge acquired and demonstrated by students through marks awarded by their teachers. Academic performance is measured through various assessments, including examinations and continuous assessments, and its goals may vary across individuals and institutions. According to Yusuf, Onifade, and Bello (2016), academic performance refers to the observable and measurable behavior of students within a specific timeframe, including scores obtained in class exercises, tests, and examinations. Martha (2009) adds that academic performance is assessed through continuous assessment or examination results, reflecting students' performance in various assessments and coursework. Educators and researchers have extensively studied the factors that contribute to improvements in students' academic performance (Singh, Malik & Sign, 2016; Ali, Haider, Munir, Khan & Ahmed, 2013; Farooq, Chaudhry, Shafiq & Behanu, 2011; Abaidoo, 2018). Ali et al. (2013) highlight that student academic performance is influenced by multiple factors, including gender, age, teaching faculty, schooling background, economic status, medium of instruction, study hours, tuition patterns, and accommodation arrangements. These factors play a role in shaping students' academic achievements and outcomes.

E-Learning

E-learning is considered in the study as the use of digital technologies such as online platforms, video conferencing tools, and learning management systems in education to strengthen the learning process and structure in order to improve students’ learning and academic performance. E-learning has emerged as a new form of learning, facilitated by electronic communication systems such as the internet. Many educational institutions worldwide have recognized the significance of e-learning, as it has significantly transformed the teaching and learning methods in higher education.

The definition of e-learning has been subject to debate and varies among different authors and researchers. The OECD (2005) defines e-learning as the utilization of information and communication technologies in educational processes to support and enhance learning. This includes using technology as a complement to traditional classrooms, online learning, or a combination of both. Arkorful and Abaidoo (2015) define e-learning as the use of information and communication technologies to enable access to online teaching and learning resources. Clark and Mayer (2016) view e-learning as instructional content delivered through digital devices with the aim of supporting learning. Urdan and Weggen (2000) define e-learning as the delivery of content through electronic media, encompassing the internet, intranets, extranets, satellite, broadcast, audio/video tape, interactive TV, and CD-ROM. Khan (2005) defines e-learning as an innovative approach that delivers well-designed, learner-centered, interactive, and facilitated learning environments utilizing various digital technologies and learning materials suitable for open, flexible, and distributed learning. Arasteh et al. (2014) consider e-learning as a method that enables individuals, especially students, to access courses remotely as long as they have internet access and other relevant platforms. Franklin and Nahari (2018) define e-learning as web-based learning, online learning, distributed learning, computer-assisted instruction, or internet-based learning.

In summary, e-learning refers to the utilization of electronic communication technologies and digital devices to support and enhance learning experiences. It encompasses a wide range of approaches, methods, and resources that enable remote access to educational materials and interactions between learners and instructors.

E-Learning Types

Under the classification provided by Algahtani (2011) and Negash and Wilcox (2008), e-learning can be categorized into:

Computer-Based Learning: This type of e-learning involves using hardware and software for communication and learning purposes.

Internet-Based Learning: Internet-based learning builds upon computer-based learning by making learning content available on the internet. It includes links to related knowledge sources that learners can access anytime and anywhere.

Asynchronous E-Learning: Asynchronous e-learning does not require real-time interaction between instructors and learners. It allows learners to access learning materials and complete activities at their own pace and convenience. Examples include self-paced online courses, pre-recorded lectures, discussion forums, and online reading materials.

Synchronous E-Learning: Synchronous e-learning involves real-time interaction between instructors and learners, simulating a traditional classroom experience. It utilizes tools such as video conferencing, webinars, and live chat to facilitate communication and collaboration. Synchronous e-learning allows for immediate feedback, live discussions, and active participation.

Blended Learning: Blended learning combines online and in-person instructional methods. It integrates face-to-face classroom sessions with online learning components. Blended learning provides flexibility and personalized learning while still allowing for direct interaction and socialization. It often includes a mix of online modules, virtual discussions, and in-person activities.

Mobile Learning (M-Learning): M-learning leverages mobile devices such as smartphones and tablets to deliver educational content. It allows learners to access learning materials anytime and anywhere, making learning more convenient and accessible. M-learning can include mobile apps, educational games, podcasts, and multimedia resources designed specifically for mobile devices.

Gamification and Game-based Learning: Gamification and game-based learning incorporate game elements and mechanics into the learning process. Gamification uses game-like features to motivate and engage learners, while game-based learning involves using educational games or simulations as the primary learning medium.

Virtual Reality (VR) and Augmented Reality (AR) Learning: VR and AR technologies create immersive and interactive learning experiences. VR places learners in a simulated virtual environment, while AR overlays digital information onto the real-world environment. These technologies enhance understanding through visualization and interactivity.

Self-paced Learning: Self-paced learning allows learners to take control of their learning process. They set their own goals, progress at their own speed, and choose resources and materials that suit their needs. Self-paced learning can be facilitated through online courses, learning management systems, and digital libraries.

Face-to-Face E-Learning: Face-to-face e-learning combines traditional face-to-face instruction with online technologies. Learners and instructors interact in real-time through video conferencing or live streaming platforms. It enables synchronous learning, immediate feedback, and dynamic discussions.

It's important to note that these types of e-learning can overlap and be combined in various ways to create more effective and engaging learning experiences. The choice of e-learning types depends on factors such as learning objectives, content, target audience, and available resources. Aspects of e-learning that are key to this study and form the basis of the objectives include E-Collaboration, E-Notes, E-Assignment, and Video Conferencing.

E-Collaboration

E-collaboration, as defined by Kibinkiri (2014), is the application of technology to extend and enhance the collaborative capabilities of individuals, regardless of their physical location, enabling them to effectively work together. It encompasses the use of electronic communication and collaboration tools that facilitate teamwork and communication among individuals or groups. Common examples of E-collaboration tools include email, video conferencing, and instant messaging, which enable real-time communication and collaboration, irrespective of geographical barriers.

The implementation of E-collaboration offers numerous advantages. One of the key benefits is improved communication and collaboration among team members. By leveraging electronic tools, individuals can easily share information, exchange ideas, and coordinate their efforts, leading to more effective collaboration and enhanced productivity. Additionally, E-collaboration can result in cost reduction, as it eliminates the need for physical meetings or travel expenses associated with traditional face-to-face collaboration. This not only saves time but also contributes to a more environmentally sustainable approach to working together.

Moreover, E-collaboration plays a significant role in enhancing efficiency. By leveraging digital tools, individuals can access and retrieve information quickly, collaborate on projects in real-time,

and streamline workflows. This efficiency boost enables teams to accomplish tasks more effectively, meet deadlines, and adapt to changing circumstances with greater agility.

From an educational perspective, the ability to collaborate effectively in online environments has become increasingly important. As Bates (2005) highlights, it is a crucial skill for the modern workplace. E-collaboration provides students with valuable opportunities to engage in shared learning experiences, foster teamwork, and cultivate their creativity, all without the constraint of physical presence. It allows learners to work collaboratively on projects, share resources, provide feedback, and engage in discussions, regardless of their location. This fosters a sense of community and encourages active participation, creating a rich and dynamic learning environment.

However, it is important to note that effective collaboration in online settings requires clear communication and guidelines. Due to the absence of non-verbal cues and face-to-face interactions, establishing clear expectations, guidelines, and protocols becomes essential. These guidelines should address aspects such as communication etiquette, task allocation, deadlines, and conflict resolution mechanisms. When properly implemented, these guidelines can help mitigate potential challenges and ensure productive and harmonious collaboration.

E-Assignment

E-assignment refers to the utilization of technology to assign, submit, and assess academic tasks. With the increasing prevalence of digital devices and online platforms, the adoption of E-assignment has gained significant popularity in recent years. As highlighted by Nuraeni et al. (2021), there are several benefits associated with using tools like Edmodo for assignment submission. One key advantage is the ability for students to receive instant feedback from teachers, enabling them to gain timely insights into their performance and make necessary improvements. E-assignment also facilitates timely submission of assignments, as students can conveniently submit their work online, eliminating the constraints of physical submission locations.

Furthermore, the flexibility offered by E-assignment allows students to complete their tasks from anywhere, as long as they have access to the necessary application on their mobile devices. This flexibility promotes self-paced learning and accommodates different learning styles. Additionally, E-assignment provides opportunities to incorporate multimedia elements into the assignments. This enables more engaging and interactive tasks, such as video presentations or audio recordings. By leveraging multimedia, students can enhance their creativity, communication skills, and presentation abilities. This approach adds a dynamic and interactive dimension to the learning experience, fostering deeper engagement and understanding.

Video Conferencing

Video conferencing can be described as a form of synchronous and interactive communication that facilitates the transfer of voice, video, and data between multiple locations through dedicated communication lines (Gough, 2006). In recent years, the use of video conferencing has skyrocketed, particularly in the context of remote work and online education. The advantages of video conferencing are numerous. Firstly, it eliminates the need for physical travel, thereby reducing costs and time constraints associated with traditional face-to-face meetings. This aspect has been particularly beneficial in the realm of education, as it enables learners and instructors to connect from different locations without the need for physical classrooms. As a result, video conferencing contributes to increased accessibility and inclusivity, allowing individuals to participate in educational activities irrespective of their geographic location.

Moreover, video conferencing enhances productivity by facilitating real-time collaboration and communication. It enables participants to interact and engage with each other as if they were in the same physical space. This fosters a sense of presence and enables instant feedback and clarification, promoting efficient decision-making and problem-solving. The ability to see and hear each other also helps to establish a stronger sense of connection and social presence among participants.

However, video conferencing is not without its challenges. Technical issues, such as unstable internet connections or audio/video quality problems, can hinder the effectiveness of the communication. Moreover, the absence of non-verbal cues and body language can make it challenging to interpret participants' intentions or reactions accurately. To mitigate these challenges, it is important to provide technical support, establish clear communication protocols, and encourage participants to be mindful of their communication styles and active engagement during video conferences.

E-Notes

E-notes, also known as electronic lecture notes, have emerged as a tool to enhance active learning experiences for students. They provide an alternative to traditional note-taking methods and leverage technology to support and augment the learning process. One of the primary benefits of e-notes is that they address the challenges associated with traditional note-taking. Instead of spending valuable time transcribing information, students can focus on actively listening and engaging with the material being presented. This shift in attention from note-taking to understanding promotes active learning, as students are encouraged to think critically, analyze concepts, and participate in class discussions.

E-notes also enhance attentiveness during lectures. With the use of digital devices, students can easily follow along with the lecture slides or materials provided by the instructor. This accessibility eliminates the need to scramble to keep up with the instructor or copy information from a whiteboard, allowing students to concentrate on comprehending the content.

Furthermore, e-notes facilitate reflective thinking. Students can easily revisit and review their notes, reinforcing their understanding and connecting concepts across different topics or courses. The digital format enables quick information retrieval, enabling students to search for specific keywords or concepts. This feature contributes to self-paced learning, as students can revisit their notes at any time, even outside the classroom.

In conclusion, E-collaboration, E-assignment, video conferencing, and e-notes are integral aspects of e-learning that have revolutionized the educational landscape. These tools and approaches facilitate effective collaboration, enable flexible assignment submission and assessment, foster real-time communication and engagement, and enhance active learning experiences. By leveraging these technological advancements, educators and learners can create a more inclusive, dynamic, and interactive learning environment that promotes knowledge acquisition and skill development.

2.0 METHODOLOGY

In this study, the descriptive survey design was adopted. Using a simple random probability sampling technique, a sample of 310 was selected out of the sample frame of 1,628 master's students from the Faculty of Education in the University of Buea and Yaoundé 1.

Table 1: Population and Sample Size of the Study

State Institution	Target Population (Total Number of Students in Faculty of Education)	Accessible Population (Masters Students in Faculty of Education)	Sample Size
University of Yaoundé 1	1431	1077	205
University of Buea	2962	551	105
Total	4393	1628	310

Source: University of Buea IT Centre and Diploma Service Office (FSE) Yaoundé 1

The instrument of data collection used in this study was a five type Likert-scale, close-ended questionnaire. Validity and reliability were ensured and Data was analyzed using both descriptive and inferential statistics. The return rate for the data collected was 99.05% because out of a total of 310 questionnaires administered 283 were returned. Results indicated that

Table 2: School of the Respondents

School of the Respondents	Frequency	Percentage	Valid Percentage	Cumulative Percentage
University of Yaoundé 1	179	63.3	63.3	63.3
University of Buea	104	36.7	36.7	100,0
Total	283	100,0	100,0	

Two Universities were retained for conducting this study. According to the results of Table 2, 179 students were from the University of Yaoundé 1 (63.3%), 104 students were from the University of Buea (36.7%).

Table 3: E-Assignment

E-Assignment	Descriptive Statistics					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
I have adequate training on how to submit my assignment online.	98 34,6%	68 24%	25 8,8%	49 17,3%	43 15,2%	2,5442	1,48539
Online assignment encourages me to submit my task or work on time.	26 (9,2%)	34 (12%)	71 (25,1%)	95 (33,6%)	57 (20,1%)	3,4346	1,20216
I can effectively submit my homework on Google classroom without any help.	34 12%	53 18,7%	43 15,2%	91 32,2%	62 21,9%	3,3322	1,32726
I perform better when I conduct my homework online than on paper.	44 (15,5%)	61 (21,6%)	63 (22,3%)	89 (31,4%)	26 (9,2%)	2,9717	1,23451
My lecturers always put notes or make remarks on my online homework so that I can perform better the next time.	50 17,7%	68 24%	61 21,6%	74 26,1%	30 10,6%	2,8799	1,27429
Overall E-Assignment						3,0325	,83848

The table above shows that the impact of E-assignment on students' performance is low ($m=3,0325$, $SD=.83848$). Among the 5 items that were designed to measure the influence of E-assignment, only 2 of the elements have a mean of 3 which is the cut-off mean. This shows that the influence of E-assignment is low partly due to poor or no proper mastering of digital tools by students.

Table 4: E-Notes

E-Notes	Descriptive statistics					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Our lecturers provide us with e-notes to complement that which is presented in lectures.	44 15,5%	38 13,4%	46 16,3%	114 40,3%	41 14,5%	3,2473	1,29741
I can easily get access to notes shared by the lecturers online.	24 8,5%	35 12,4%	55 19,4%	116 41%	53 18,7%	3,4912	1,17710
With e-notes, I can read and prepare for lectures in advance	20 7,1%	28 9,9%	59 20,8%	121 42,8%	55 19,4%	3,5760	1,12218
I have a better understanding of the lectures with e-notes	37 13,1%	39 13,8%	75 26,5%	94 33,2%	38 13,4%	3,2014	1,22260
I prefer e-notes to notes taken in class during lectures.	61 21,6%	72 25,4%	60 21,2%	62 21,9%	28 9,9%	2,7314	1,29043
Over all E-Notes						3,2495	,79508

The table above shows that E-notes have an impact on students' performance ($m=3,2495$, $SD=.79508$). Among the 5 items that were designed to measure the influence of E-notes, 4 of the elements have a mean of 3 which is the cut-off mean. This shows that most students can easily access notes and videos shared online and they perform better when using this method of learning.

Table 5: E-Collaboration

E-Collaboration	Descriptive Statistics					Mean	Ecart Type
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
I have good skills on working a presentation online with my classmates	43 15,2%	78 27,6%	63 22,3%	74 26,1%	25 8,8%	2,8587	1,21799
I enjoy working with my teammates in a virtual space	32 11,3%	55 19,4%	67 23,7%	104 36,4%	25 8,8%	3,1237	1,16490
I can effectively converse and exchange information with others using e-learning communication tools	17 6%	36 12,7%	54 19,1%	122 43,1%	54 19,1%	3,5654	1,11651
I prefer e-collaboration to physical collaboration	65 23%	74 26,1%	60 21,2%	62 21,9%	22 7,8%	2,6537	1,26332
Every team mate participates during group work.	56 19,8%	85 30%	50 17,7%	63 22,3%	29 10,2%	2,7314	1,28768
Over all E-Collaboration						2,9866	,78367

The table above shows that the impact of E-collaboration on students' performance is very low ($m= 2,9866$, $SD=.78367$). Among the 5 items that were designed to measure the influence of E-collaboration, only 2 of the items have a mean of 3 which is the cut-off mean. This shows that the influence of E-collaboration is low partly due to the fact that students do not possess the necessary skills required to work with peers online and as such are not familiar with this mode of learning.

Table 6: Video Conferencing

Students' performance	Descriptive Statistics					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
I am aware of the existence of videoconferencing tools.	17 6%	35 12,4%	30 10,5%	101 35,7%	100 35,3	3,8198	1,21137
My network is always good during video conferencing.	58 20,5%	92 32,5%	57 20,1%	57 20,1%	19 6,7%	2,6007	1,20854
I am able to join a videoconferencing meeting without any help	28 9,9%	59 20,8%	50 17,7%	95 33,6%	51 18%	3,2898	1,25794
I have a good phone or computer that permits me to join the virtual classroom.	33 11,7%	63 22,3%	47 16,6%	92 32,5%	48 17%	3,2085	1,28645
I can effectively manage the video conferencing tools without disturbing the other participants.	32 11,3%	54 19,1%	65 23%	89 31,4%	43 15,2%	3,2014	1,23702
Over all Video conferencing						3,3534	,88245

The table above shows that Video Conferencing has an impact on students' performance. ($m=3,3534$, $SD=.88245$). Among the 5 items that were designed to measure the influence of Video conferencing, 4 of the elements have a mean of 3 which is the cut-off mean. This shows that the Video conferencing has an influence on students' performance.

Table 7: Students' Performance

Descriptive Statistics							
Students Performance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
The use of e-learning enhances my learning performance.	15 5,3%	40 14,1%	61 21,6	109 38,5	58 20,5	3,5477	1,12374
I become motivated to learn independently.	13 4,6%	36 12,7%	59 20,8%	127 44,9%	48 17%	3,5689	1,05757
Students are more engaged in the E-learning method than in the traditional method.	45 15,9%	72 25,4%	67 23,7%	71 25,1%	28 9,9%	2,8763	1,23580
Students frequently participate more with e-learning.	36 12,7%	73 25,8%	66 23,3%	79 27,9%	29 10,2%	2,9717	1,20838
E-learning enhances my learning experience as well as communication skills	9 3,2%	34 12%	41 14,5%	119 42%	80 28,3%	3,8021	1,07670
Over all Students performance						3,3534	,73847

The table above shows that students' performance is low ($m=3,3534$, $SD=.73847$). Among the 5 items that were designed to measure students' performance, 3 of the elements have a mean of 3 which is the cut-off mean.

Table 8: Test of Normality

Test of Normality	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistique	ddl	Signification	Statistique	Ddl	Signification
E_Assignment	,064	283	,006	,989	283	,035
E_Notes_	,115	283	,000	,977	283	,000
E_Collaboration	,079	283	,000	,988	283	,022
E_Video_Conferencing	,078	283	,000	,986	283	,006
Students_performance	,089	283	,000	,984	283	,003

a. Correction de signification de Lilliefors

In this table, we are interested only on the results of Kolmogorov-Smirnov because our sample population is greater than 100. Also, the table shows that the data are not normally distributed because all the p value of our variables are statistically significant, meaning that they are lower than 0.05.

Hypothesis Testing

H₀₁: E-assignment has no significant effect on student's performance

H_{a1}: E-assignment has a significant effect on student's performance

The results of the Spearman Rank Correlation as shown in the table indicate a low positive correlation between E-assignment and students' performance, ($r_s=0.370$, $p<0.05$).

Decision: We reject the null hypothesis and accept the alternative.

H₀₂: E-notes and videos have no significant impact on students' performance

H_{a2}: E-notes and videos have a significant impact on student's performance

The results of the Spearman Rank Correlation show a moderate positive correlation between E-notes and videos and students' performance ($r=0.534$, $p<0.05$).

Decision: We reject the null hypothesis and accept the alternative

H₀₃: E-collaboration has no influence on student's performance

H_{a3}: E-collaboration has an influence on student's performance

The results of the Spearman Rank Correlation show a moderate positive correlation between E-collaboration and students' performances, ($r=0.488$, $p<0.05$).

Decision: We reject the null hypothesis and accept the alternative

H₀₄: Video conferencing has no influence on student's performance

H_{a4}: Video conferencing has an influence on student's performance

The results of the Spearman Rank Correlation show a low positive correlation between video conferencing and students' performance, ($r=0.398$, $p<0.05$).

Decision: We reject the null hypothesis and accept the alternative

Discussion of Objectives

The Effect of E-Notes and Lectures on Students' Performance?

The findings revealed that most students agreed that their lecturers provided online notes to complement lectures, and they could easily access these materials. Students also reported that online notes helped them study and prepare for lectures in advance, and they believed that they had a better understanding of the course through electronic notes. However, it was found that most students did not prefer electronic notes over notes taken in class during lectures. These findings are consistent with a study by Nasim et al. (2021), which also highlighted the positive impact of video-based learning websites on students' academic performance. The use of video-based learning websites during the COVID-19 pandemic served as an alternative to in-person lectures and helped enhance students' listening, speaking, and writing skills, as well as their in-depth knowledge of the subject. Thus, the integration of e-notes and videos can have a positive impact on students' learning outcomes. These digital resources provide students with additional learning materials, the ability to review content at their own pace, and the opportunity for self-directed learning. It underscores the potential of e-learning platforms to supplement traditional teaching methods and engage students in more interactive and flexible learning experiences. By incorporating e-notes and videos

effectively in the curriculum, educators can leverage technology to support students' learning and enhance their overall academic achievements.

The Effect of E-Assignment on Students' Performance?

The findings reveal that most students in the study were not adequately trained on how to submit their assignments online. However, it was observed that when using e-assignment, students tended to submit their tasks on time, and they were able to effectively submit their homework on platforms like Google Classroom without assistance. However, most students did not agree that they performed better when conducting their homework online compared to using traditional paper-based methods. Additionally, it was found that the majority of lecturers did not provide notes or remarks on students' online homework to help them improve their performance.

This finding aligns with a study by Cook and D. Bishop (2018) that indicates a correlation between online homework scores and course grades when the homework constituted a significant portion of the overall grade. They also highlighted the importance of time spent on homework in achieving higher course grades and increasing student engagement with the course material.

The Effect of E-Collaboration on Students' Performance

The findings indicate that most students in the study did not possess good skills in working on an online presentation with their classmates. However, they expressed enjoyment in working with their teammates in a virtual space. Additionally, it was observed that most students agreed that they could effectively converse and exchange information with others using e-learning communication tools. These findings are consistent with a study conducted by Mehar (2020), which investigated the effect of an online collaborative learning strategy on achievement in economics in relation to self-efficacy. The study found that students taught through online collaborative learning demonstrated greater achievement compared to those taught through conventional teaching methods. This highlights the importance of promoting effective teamwork, communication, and the use of e-learning tools in educational settings to enhance student outcomes.

The Effect of Video Conferencing on Students' Performance?

The findings reveal that most students agreed they were aware of the existence of video conferencing tools. However, they expressed disagreement regarding the quality of their network during video conferencing. Nonetheless, most students reported being able to join a video conferencing meeting without assistance and possessing computers that allowed them to participate in virtual classrooms. Moreover, students agreed that they could effectively manage video conferencing tools without disturbing other participants.

These findings are consistent with Palisada's (2018), study that found a strong positive and significant difference in students' attitudes before and after engaging in video conferencing. Thus, video conferencing was found to have a significant influence on students' attitudes toward learning. In the context of e-learning and its effects on students' performance, this analysis suggests that while video conferencing may influence students' attitudes, it does not significantly predict or enhance their academic performance. It is important to consider these findings when designing and implementing e-learning strategies, recognizing that video conferencing alone may not be sufficient to drive significant improvements in students' academic achievements.

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