The Perceived Impact of Digital Transformation on Students' Learning during the COVID-19 Pandemic at a Particular Tertiary Institution

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Abstract: *The COVID -19 pandemic has over the last two years impacted educational institutions globally resulting in many colleges and universities going online. The teaching and learning delivery have experienced severe disruptions as institutions move their teaching and learning activities to online platforms. The present study examined the perceived impact of digital transformation on students' learning during the COVID-19 Pandemic at a particular tertiary institution among a set of college students and the challenges faced from the transition to online modality. For this purpose, participants were engaged in an online survey via a Google Forms link which directed them to the online survey. The review demonstrates that in addition to technical challenges, connectivity problems, and subpar student interfaces, students' discontent with the assistance programs implemented by their educational institution resulted from the shift in learning to an online format. Furthermore, students mentioned that there were some benefits in relation to lower expenses for uniform purchases and transportation to school. In order to improve crisis readiness and maintain educational continuity and quality during a global crisis like the COVID-19 pandemic, the recommendations for future research should be done to ascertain the impact of the digital transformation on students' learning during the pandemic.*

Keywords: Digital Transformation, Students' Learning

1. Introduction

The world was unprepared for COVID-19, which caused chaos and disruption in all industries, including the education sector, resulting in everyone involved in education to alter their practices. In fact, the pandemic drove educational institutions all over the world to switch from face-to-face instruction to virtual instruction. In the Caribbean, and other parts of the world, the COVID-19 pandemic forced the closure of all schools, including postsecondary institutions. Mishra et al., (2020) alluded from elementary to higher education, the entire educational systems had to drastically change their activities in a matter of weeks in order to transition to an online teaching-learning environment.

Another research report that in response to the growing coronavirus outbreak, institutions of higher learning have closed their doors and switched from face-to-face delivery to an online modality in order to retain students and maintain access to learning (The Impact of Coronavirus on Higher Education, 2020). Thus, in order to maintain learning continuity, colleges and universities changed their pedagogy and resorted to digital solutions.

Jack and Smyth, (2020) share that educational institutions are now concentrating their efforts on enabling an unexpectedly quick and seamless transition to online learning and assessment. As a result, educational institutions have made efforts to use digital resources to carry on the learning process. Thus, the integration of technology into the classrooms around the world has accelerated due to the emergence of Covid-19 pandemic which "significantly shifted education from traditional to an online version and was an emergent state for teachers and students" (Akram et al., 2021).

This shift has had an impact on institutional stakeholders and even presented a threat to humankind as a whole.

International and comparative research report higher education systems in relatively low-income nations and regions have suffered greatly due to a lack of infrastructure and resources for online teaching and learning, not to mention regional variations in educational cultures, administration, and practices(Vegas, 2020; Mok, et al., 2021).

The pandemic's effects will usher in a period of profound technological change, with the global higher education system becoming increasingly digital (Krishnamurthy, 2020). The disruptive effects of COVID-19 have created both opportunities and challenges for higher education institutions to transform, as universities fundamentally reevaluate and redesign their educational offerings to meet this new reality (Carolan et al., 2020).In the meantime, increasing number of research are examining the impact of the COVID-19 pandemic on digital transformation in higher education in 2020 (Garcia-Penalvo & Corell, 2020; Pazos et al., 2020).

2. Methodology/Instrumentation/Population/Sample

The study applied a quantitative approach that provided a numerical examination of the research topic. The study was reliant on a survey that provided several social, economic and expedient benefits which provided useful information for the study. The survey consisted of 17 closed ended questions. In the first part of the survey, respondents were asked to describe their basic demographics, IT skills and experience in e- learning. In the second part, respondents were asked to choose all the many options applied to them regarding advantages and disadvantages of e-learning. In the third part, respondents were required to rate the effectiveness of e-learning. In the fourth section, respondents were asked to disclose the effects of online education on their finances. Lastly, they were asked to you

speak to the different types of digital tools used to facilitate their online learning.

This study looked at the relationship between e-learning and the digital transformation of tertiary students' "classrooms" using numerical data. The Google Forms link was used to engage participants which took them directly to an online survey designed to measure students' thoughts and experiences since the Covid-19 pandemic-related digital transformation. In particular, it highlighted the difficulties and efficacy faced by college students and explained the effects of such a shift.

This study aimed to investigate, through the use of numerical data, how e-learning was affecting tertiary students as their "classrooms" became increasingly digital. Through the use of a Google Forms link, participants were directly prompted to complete an online survey designed to measure students' thoughts and experiences following the Covid-19 pandemic-induced digital transformation. It specifically discussed the effects of this change by stressing the difficulties and efficacy faced by students at the College.

The target audience consisted of all 1200 students and instructors at the College. A non-probability sampling technique was applied to select the sample from the population. A deliberate sampling strategy was used in the proposed study (Patton 2002). "A selection strategy in which particular settings, persons, or activities are deliberately selected in order to provide information that can't be gotten as well from other choices" is how Maxwell (2005) defines purposeful sampling (p. 88). There were sixty participants in the sample size.

3. Data Presentation and Analysis and Interpretation and Discussion

Findings
The basic demographics for the 60 respondents are outlined in diagrams 1 and 2. 61.7% represented females and 38.3 % represented males. All 100% of the students were enrolled were fulltime undergrad students with 11 in the first year, 10 in the second year, and 13 in the third year and the remaining 26 in fourth year as indicated in diagram 2.
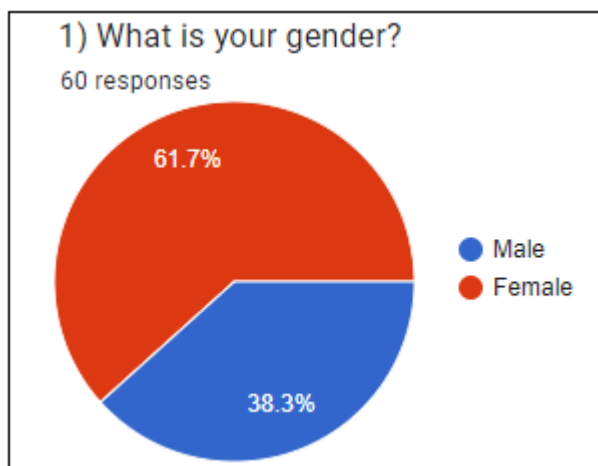

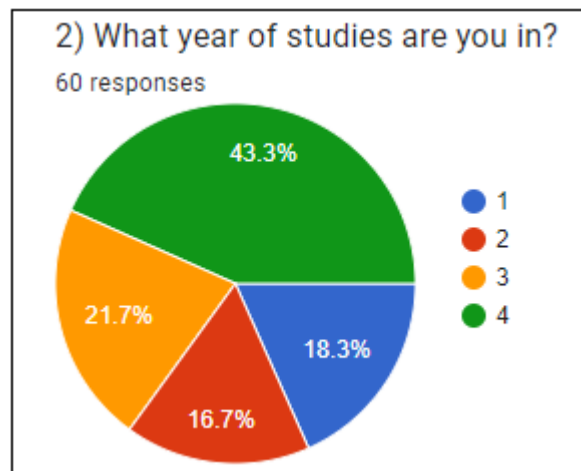**Diagram 1:** Showing responses for the gender of the responses

Diagram 2: Showing responses for the year of studies of the respondents

Question 4: speaks to the number of students who had experience with the online learning platform prior to the pandemic. Approximately, 34 respondents had no prior experience, while 26 respondents had prior experience. Both males and females had 13 affirmative responses, meaning that the genders were equal in terms of their exposure to online learning prior to COVID-19.

The third question was, "On a scale of 1 to 5 students were required to rate their Information Technology skills, with 1 being the lowest and 5 being the highest. For this question, 25 respondents rated their skills as average which represented 3. Another 22 respondents rated 4, while 10 respondents rated 5 and only 3 respondents rated their skill with a 2. No participant reported having no skills. Of the 26 year 4 students that responded, 17 indicated that their skill was above average with a rate of 4 or 5. Only 5 years 1 students indicated same showing that those in a higher grade would have been more experienced with online learning.
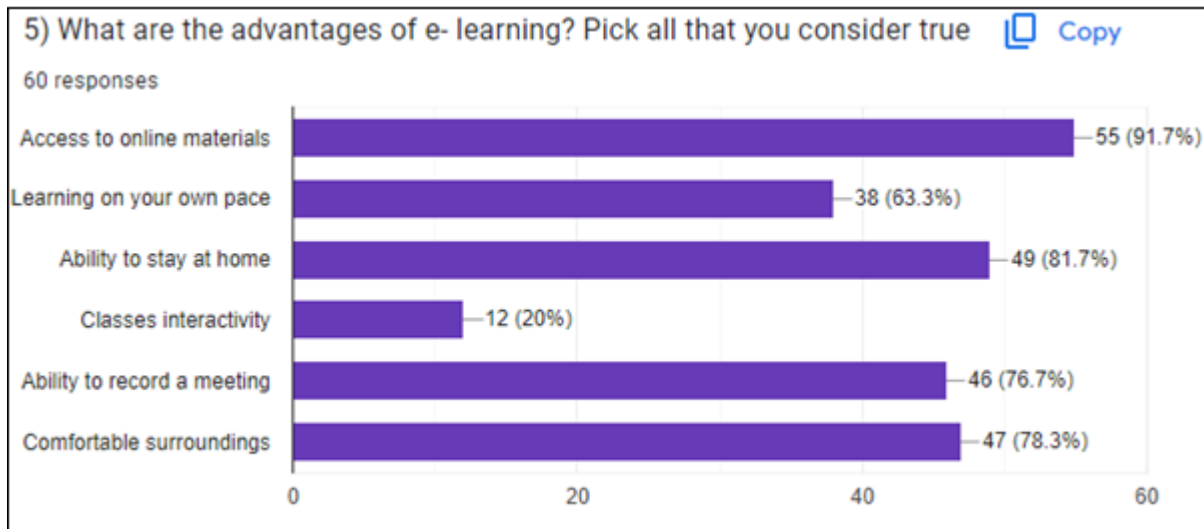
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Diagram 3: Showing the advantages of e-learning

Access to online materials was the greatest advantage identified by the students evidenced in the 91.7% response. These materials accessible through the internet such as various multimedia, documents, applications and websites were found to be beneficial for students as they transitioned to an online modality. Following that with an 81.7% response was the ability to stay at home. Comfortable surroundings and the ability to record a meeting this followed suit with a 78.3% and a 76.6% of respondents agreeing respectively. The interactivity of the class received the lowest number of responses with only 20% agreeing that it was an advantage.

Diagram 4 shows the students' responses as to what are the disadvantages of e-learning. 20 students agreed that poor learning condition was a disadvantage whilst half of the respondents agreed that social isolation was an issue. Both reduced interaction with one's lecturers and a lack of self-discipline received a 65% agreement each. 34 students agreed that the lack of interaction with their fellow classmates was a problem whilst, technical difficulties received an 88. 3% rate of agreement. Technical difficulties were therefore the leading disadvantage experienced by students as they transitioned to online classes.
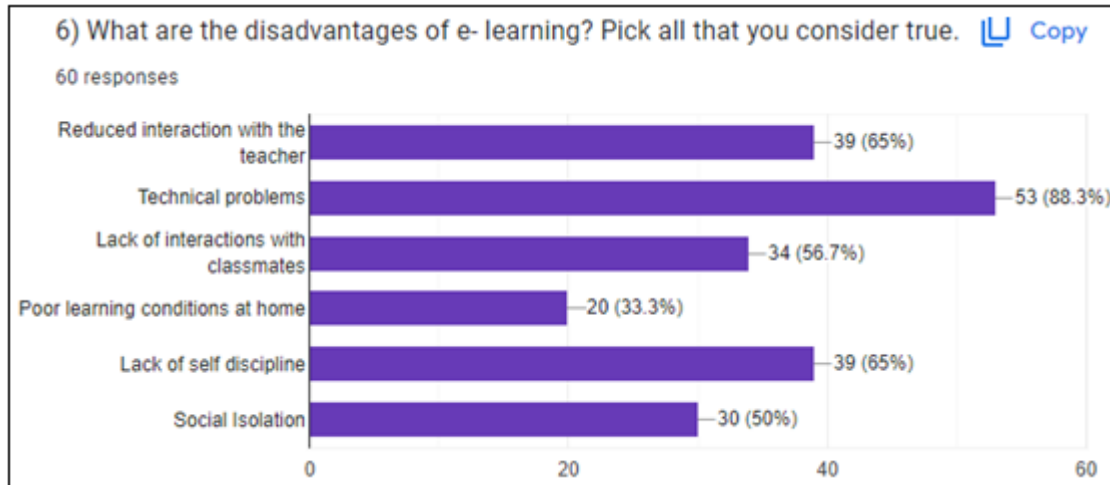

Diagram 4: Showing the disadvantages of online learning

In question 7, students were asked to rate, from 1-5 with 5 being the highest, the effectiveness of e-learning in terms of increasing their knowledge. No students reported that e-learning was extremely ineffective whilst almost half of the respondents (28) agreed that it was effective, scoring it a 3. 6 students each rated the effectiveness of e-learning with a 2 and 5 and the remaining 20 students rated it with a 4.
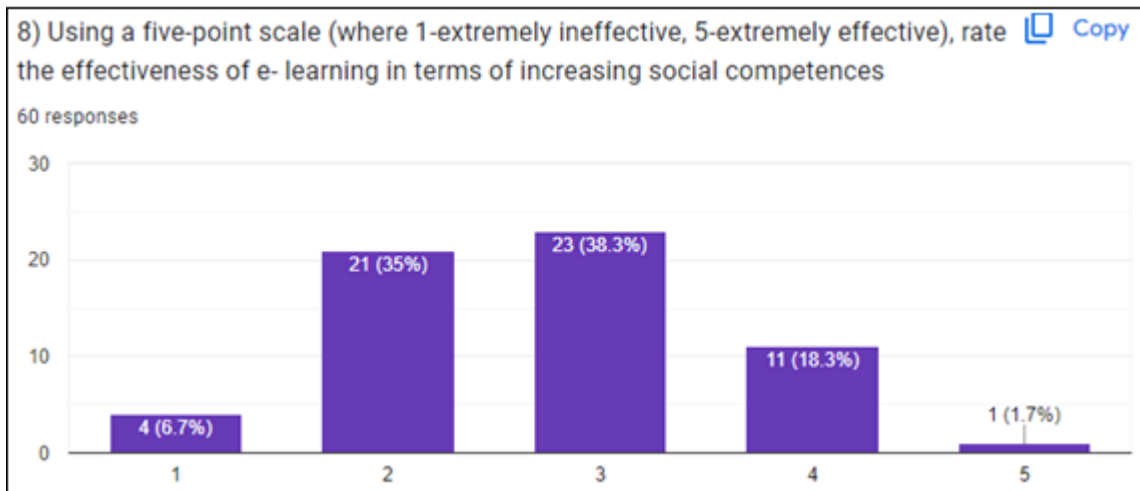
Diagram 5: Showing the effectiveness if e-learning in increasing social competences.

In the previous question, more than half of the respondents each indicated that the lack of interaction with teachers and fellow students and other forms of social interactions was a disadvantage of having classes online. This is in correspondence to the responses shown above with only a fifth of respondents (11) indicating that e-learning was either effective or extremely ineffective in increasing social competences.

Students were asked in question 9 to rate their participation in online classes on a scale of 1-5 with 5 being extremely active. The responses shown in diagram 6 indicated that 5 students each rated that they were either extremely or moderately inactive, with the majority, 23 students, rating themselves as being moderately active. 33.3% (20 students) rated themselves as just below extreme activity with a 4 and the extremists totalled 7 students. Just over half of the respondents would have therefore been exercising the bare minimum or below with regards to participating in online classes.
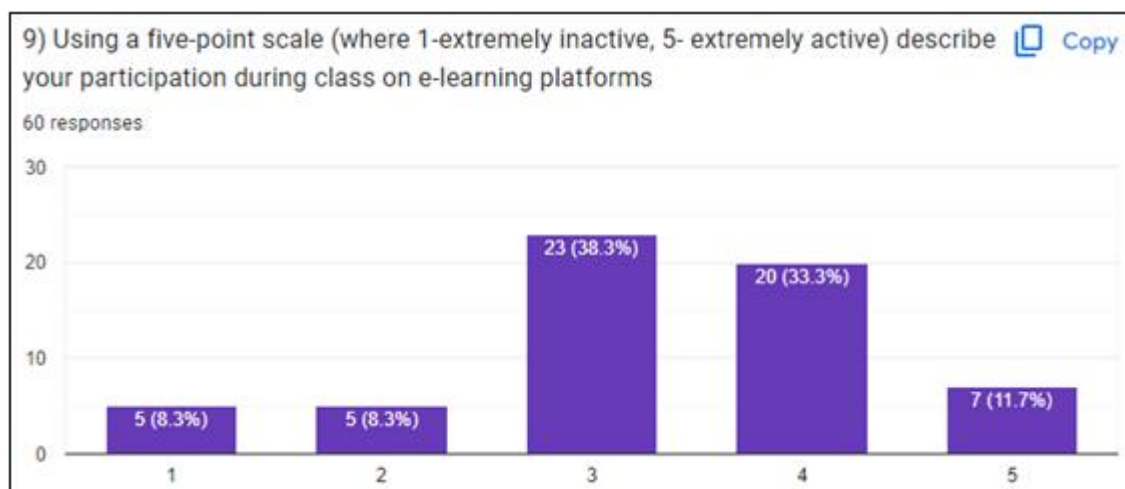

Diagram 6: Showing how students rated their activeness in online classes
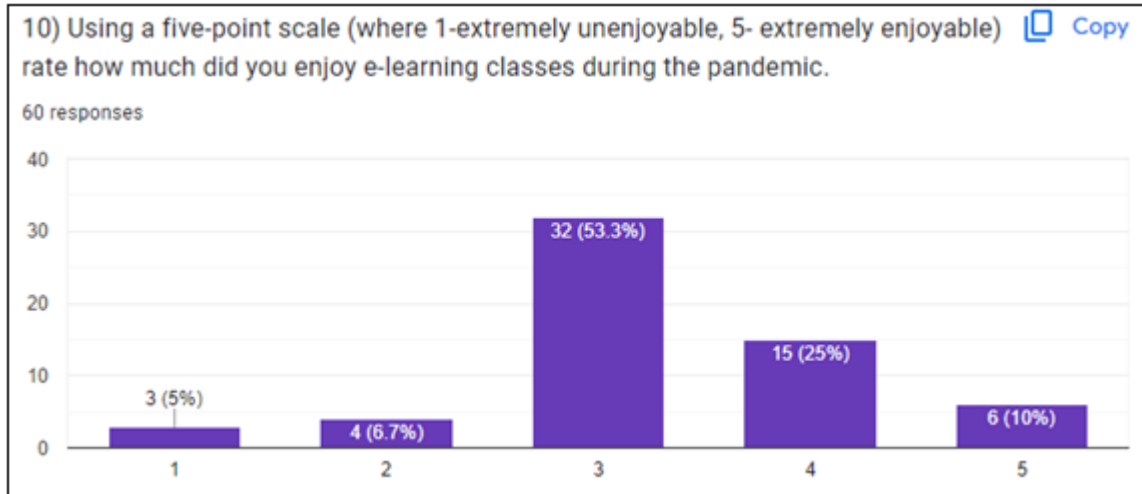
Diagram 7: Showing how much students enjoyed online classes

It is noted only 3 students out rightly found the classes to be non-enjoyable, 4 students moderately found it non-enjoyable, 32 students moderately enjoyed their classes, and 15 students found those classes to be a bit more pleasurable and only 6 students reported having extremely enjoyable classes. Therefore, a minority (7) of the students would have derived little or no pleasure form their classes online.

In question 11, students were asked to identify the financial disadvantages faced by them and their families when Covid-19 required them to move to online school. 26 students found that they had to purchase new equipment. 23 indicated that they had to either install or upgrade their data/ internet packages. 10 students found that they had to purchase furniture to design or recreate a space for a 'classroom'. Another 5 incurred transportation costs for having to relocate to an area more conducive for learning than their homes. 20 students indicated that they had to purchase items

to use at home that would have otherwise been made free at school whilst only 4 respondents stated that they experienced no financial disadvantages. Switching to an online modality therefore had great financial implications for the students and their respective families.

Question 12 asked students to state the reverse- the financial advantages they would have experienced with the switch. Half of the respondents indicated that they already had a stable internet connection and 35 of them reported already having the devices they needed to accommodate the switch. Only 20 students already have a space at home dedicated for school. The online modality led 49 respondents to realize that they need not purchase school uniforms and other school resources necessary for online learning and another 43 to cut their transportation costs in travelling physically to school. A large number of respondents experienced financial advantages.
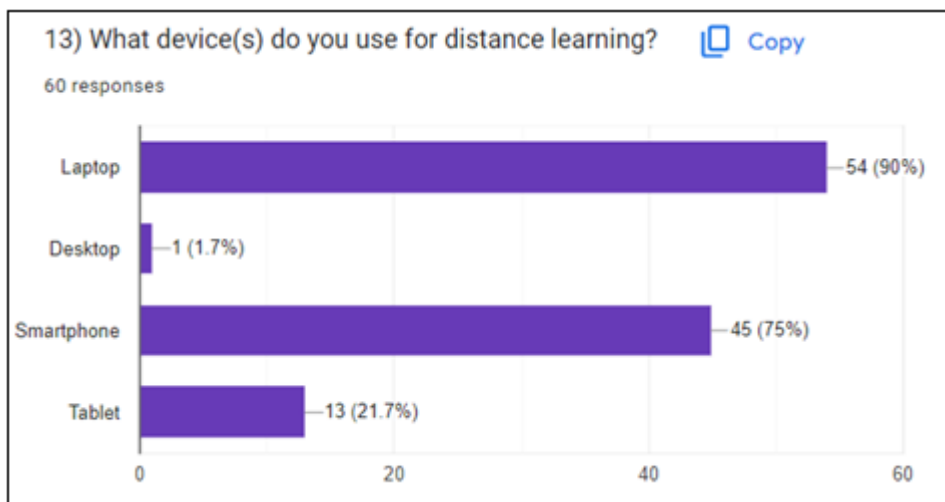

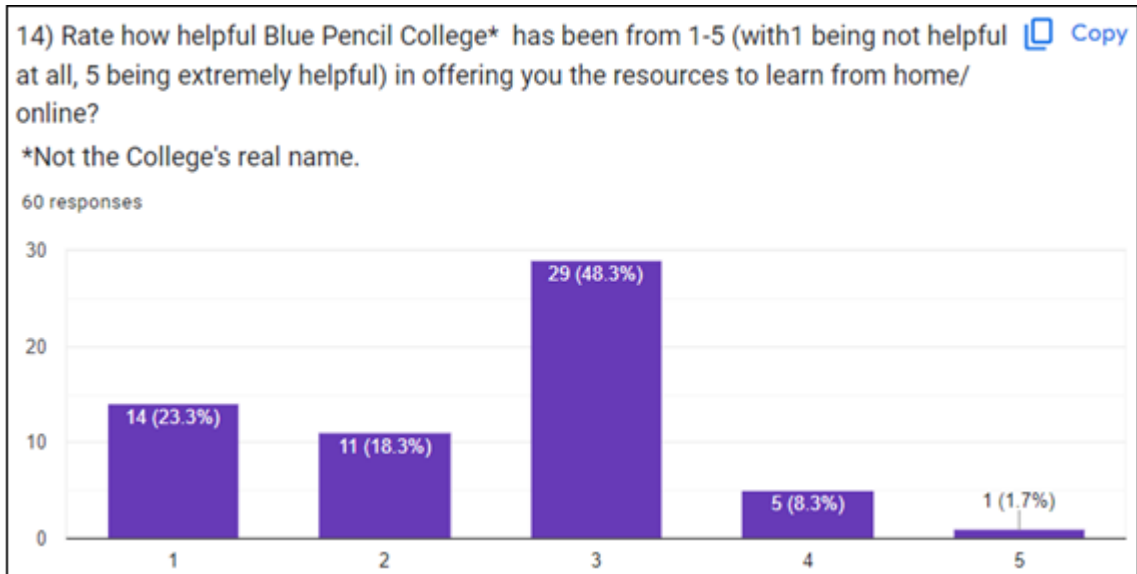**Diagram 8:** Showing the devices use by students in distance learning.

Diagram 9: Showing how helpful Blue Pencil College had been in assisting students in learning from home

The diagram above indicates that an overarching 48.3% of students believed that the college's assistance was average by scoring a 3. Only 1 student believed that the college was extremely helpful whilst 14 students believed that the institution was not helpful at all. 18.3% believed they were moderately helpful and the remaining 8.3% believed that the assistance offered was just above average.

Question 15 inquired about the digital approaches that students had been exposed to during the transition to online learning. Most students were familiar with PowerPoint presentations as the response gained a 93.3% selection. The second most popular modes were videos and video/voice calls which both gained an 80% rate of selection. Group chats, digital white board and pen and animation saw 78.3%, 55% and 26.7% of respondents selecting them. The question asked the students to select from the aforementioned options and to write any others not included, to which 1.7% of students indicated that they had been exposed to Google classroom and Moodle.

Diagram 10: Showing the digital approaches students had been exposed to

Question 16 required respondents to select and/or otherwise indicate the various types of applications used to administer and facilitate classes online. Their responses are shown below in diagram 11.

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Diagram 11: Showing the online applications used to facilitate classes

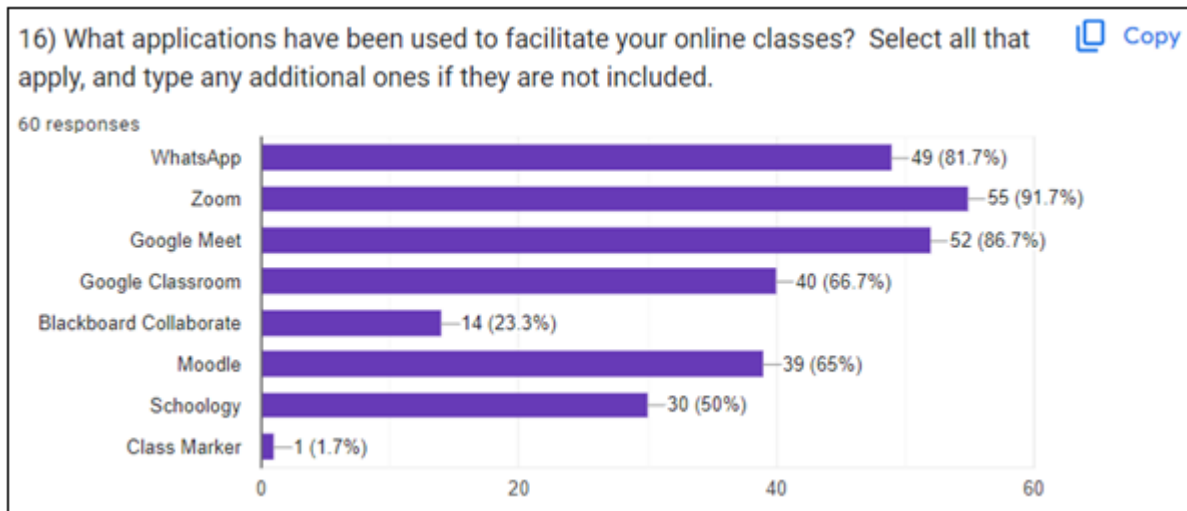The final question asked how effective did the students believe the applications mentioned in question 16 to be with regards to providing them with quality education on a scale where 1 was extremely ineffective and 5 was extremely effective. 2 students each indicated that the applications were either extremely ineffective or moderately effective. 21 respondents believed that they were average in their effectiveness. The highest rated score was 4, with 24 responses, where students believe that their effectiveness was just above average. Ultimately, only 11 students believed that the applications were extremely effective.

4. Summary and Conclusions

The aforementioned findings implied that students' tertiary education was disrupted by the abrupt closure of colleges and universities in reaction to the pandemic, which forced them to use online learning platforms. Additionally, they found it difficult to maintain the self-control needed for effective online learning, also, it was difficult to engage with other students and form social bonds. According to the results, 80% of students thought that class interactivity was poor.

The results above suggest that the sudden closure of schools and universities in response to the pandemic resulting in the using of the online learning platform has disrupted the learning process for students at tertiary institutions.

The claim that there is a lack of social interaction with online engagement is supported by Diagram 4, where half of the respondents agreed that social isolation was a problem. Additionally, as seen in diagram 4, the results showed that the biggest drawback that students encountered when switching to online classes was technical difficulties. This indicated a rating of 88.3%. A 65% agreement rate was given to both decreased interaction with instructors and a lack of self-discipline. The lack of interaction among classmates was cited as a problem by 34 students, whereas technical issues were agreed upon by 88.3% of respondents. Thus, the biggest drawback that students encountered during the transition to online classes was technical issues.

Twenty-three students self-reported as being moderately active in their online class participation. A total of 7 students were considered extremists, while 33.3% (20 students) rated their own behavior as slightly below extreme. As a result, slightly more than half of the respondents would have been engaging in minimal or no online class participation, demonstrating the enjoyment that students had from taking classes online. As a result, seven students, or a minority, would have derived little or no pleasure form their classes online.

In question 11, students were asked to identify the financial disadvantages faced by them and their families when Covid-19 required them to move to online school. 26 students found that they had to purchase new equipment. 23 indicated that they had to either install or upgrade their data/ internet packages. 10 students found that they had to purchase furniture to design or recreate a space for a 'classroom'. Another 5 incurred transportation costs for having to relocate to an area more conducive for learning than their homes. 20 students indicated that they had to purchase items to use at home that would have otherwise been made free at school whilst only 4 respondents stated that they experienced no financial disadvantages. Switching to an online modality therefore had great financial implications for the students and their respective families.

Question 12 asked students to state the reverse- the financial advantages they would have experienced with the switch. Half of the respondents indicated that they already had a stable internet connection and 35 of them reported already having the devices they needed to accommodate the switch. Only 20 students already have a space at home dedicated for school. The online modality led 49 respondents to realize that they need not purchase school uniforms and other school resources necessary for online learning and another 43 to cut their transportation costs in travelling physically to school. A large number of respondents experienced financial advantages

How helpful was the college in assisting online students? The diagram above indicates that an overarching 48.3% of students believed that the college's assistance was average by scoring a 3. Only 1 student believed that the college was

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As a result of the COVID-19 pandemic, online learning has become the new standard for postsecondary students. Notwithstanding its benefits, it also carries some drawbacks. The flexibility offered by online learning is one of its advantages. Learners can set their own schedules and learn at their own speed, additionally, they can juggle their academic obligations with other personal commitments. Furthermore, online education saves time and money by doing away with the need for commuting.

However, a significant drawback is the absence of in-person interactions with peers and instructors. Students may experience emotions of alienation and detachment as a result, which may have a detrimental effect on their mental well-being and academic achievement. Distraction is another potential drawback. Students can sometimes be more likely to become side-tracked by social media and other online activities when learning online. This may result in inattention and decreased output. Lastly, access to technology and a dependable internet connection are prerequisites for online learning. These resources aren't available to every student, which can lead to educational disparities.

Thus, it is critical that institutions and other education stakeholders address these problems and help students through this shift.

5. Recommendations

Incorporating online learning in the post- pandemic tertiary education environment and to and to reduce the negative impacts that come with such a transition, the following are essential components for the online teaching-learning approach to be successful:

1) Institutions should embark on infrastructure and technology investments to facilitate online learning. This entails giving students access to computers, fast internet, and learning management systems so they can complete assignments, tests, and classes online.
2) Offer faculty members training and support: Assist faculty members in making the switch to online teaching, institutions should offer them training and support. Training on LMS platforms, online methodology in teaching and learning, creating engaging online courses, and interacting with students in virtual classrooms are all included in this.
3) Design courses with online delivery in mind: courses ought to be created with online delivery in mind. This entails utilizing multimedia tools, producing interactive content, and integrating remote-collaborative activities.
4) Ensure accessibility: Educational institutions must guarantee that all students, including those with disabilities, can access online courses. This entails making sure that online platforms are compatible with assistive technologies, utilizing accessible formats for course materials, and offering closed captioning for videos.
5) Encourage student engagement: Institutions should encourage student engagement in online courses by providing opportunities for interaction and collaboration. This includes using discussion forums, group projects, and virtual office hours are examples of this.
6) Assess learning outcomes: When delivering online courses, institutions should appropriately assess learning outcomes and compare students' performance to predetermined learning objectives. This is to guarantee that learners are reaching the same degree of proficiency as they would in traditional face-to-face instruction.
7) Offer flexibility: To meet the needs of students who might be experiencing difficulties because of the pandemic, educational institutions should offer flexibility in the way that courses are delivered. This entails giving students a range of options for how the course materials are delivered as well as granting extensions or other accommodations in the event of an illness or other disruption.

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