How the COVID-19 Shutdown Impacted Student Grades at the Collegiate Level?

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Abstract

During the Spring 2020 semester, universities around the world were forced to make quick decisions and adjustments to their learning environments to offset the COVID-19 pandemic impacts. This swift conversion of face-to-face and hybrid courses to an online / remote learning environment left higher education institutions in disarray causing them to quickly execute a transition plan that had never been deemed necessary. While some faculty were pushed into a new and unfamiliar environment, students were left scrambling to acquire trainings and resources to help with their transition. This study analyzed the impact of training and resources provided to students / faculty and how they affected students' final grades. The researchers distributed a survey at two small mid-Atlantic universities with 139 respondents at the undergraduate and graduate levels. The results of the study were analyzed to understand the overall impact on students' final grades. The outcome of the study assessed this impact to identify gaps that should be considered to better support student learning.

Keywords: Covid 19, pandemic, remote learning, grading impact, online learning, faculty

1. INTRODUCTION

Since March of 2020, everyone has had some daily impact related to the COVID-19 pandemic. These impacts include major disruptions in how one completes daily tasks, school, employment, and overall health. In the blink of an eye, first year students to graduating seniors were forced to change from sitting in the classroom to returning home and joining a virtual world. While this decision was not one that administrators in higher education would overturn, it is one that could ease the impact with a proper implementation plan.

As of July 2020, 98.6% of student learners were impacted by the pandemic spanning 200 countries and affecting 1.725 billion students in pre-primary to higher education (United Nations, 2020). To mitigate the risks associated with the modified instructional delivery due to the pandemic, universities had to equip their students and faculty with tools, training, and resources to help foster a better learning environment. While this was no easy task, it was an essential one that would otherwise compromise the success of our education and instructional delivery. Online coursework is very popular, and one often forgets that a substantial student base and faculty have remained committed to face-to-face instruction and have never endeavored into a virtual learning environment. This exploratory study will assess the impacts on students' final grades based upon trainings and resources that were made available to them by the university.

2. LITERATURE REVIEW

Garcia et.al. (2020) have a three-pronged plan for addressing the impacts of COVID-19 on education which they call the three R's: relief, recovery, and rebuilding. Relief provides schools the resources so that they can offer effective instruction and support. Recovery is investing to help students make up lost skills as school returns to normal operations. Rebuilding is redesigning the system to focus on skills development which ensures that all students have access to resources that will enhance learning and development.

The flexibility of E-Learning compared to face-to-face teaching has led to many students becoming "self-directed learners" (Keis, 2017). However, some studies have shown that a number of learners have difficulty in the area of self-discipline. There must be an ongoing interaction between students and instructors, along with a stated clarity of the requirements and goals of the learning process. (Dochery et.al., 2019) Research has shown that two-way feedback helps the student to stay connected and motivated. This interaction, along with social support is essential in the success of this type of modality (Bernard et.al. 2009). Social and collaborative learning allows students to work together and expand their knowledge in a collective forum.

For students to be successful with online learning both students and faculty must be proficient in their use of online learning tools. This of course assumes that both students and faculty have access to the appropriate technology and Internet. A critical aspect highlighted by Bettinger and Loeb (2017) is that online courses are difficult, especially for students that a not prepared.

Technology can have a downside as well and dependence on it to deliver critical services can lead to phenomena such as "Zoom fatigue" and sense of loss around deep personal connections which foster belonging (Ramachandran, 2021). At the same time, the rise of almost complete dependence on ICT to help foster connection and belonging has only highlighted disparities among students that college and university staff already knew existed. O'Brien (2020) speaks to the technological divides that "leave some of our most vulnerable students struggling with limited or no broadband access and/or without appropriate devices to engage in learning" (para. 7).

Aucejo et.al. (2020) conducted a study at Arizona State University during the pandemic and found that 13% of students delayed graduation, 11% of students withdrew from a class and 12% of students changed their major. The authors stated, "if students perceive a negative treatment effect of COVID-19 on the returns to a college degree, this belief will have an impact on their future human capital decisions (such as continuing with their education, choice of major, etc.)."

A study conducted by Rodriguez-Planas (2021) analyzed approximately 12,000 college students' academic records. The study compared low-income students to their higher-income peers. The results revealed that top-performing lower-income students had a decrease in grades by 5% and earned credits by 11% as compared to their higher-income peers. Recent studies (Aucejo et al. 2020; Rodriquez-Planas 2020) have found that lower-income college students were more likely to experience online learning challenges, considered dropping classes and delayed graduation as compared to their higher-income

peers. These percentages were derived from comparing the COVID-19 lockdown students to the previous three years of grades.

Engzell et.al. (2021) evaluated the effect of school closures as it related to school performance during the COVID-19 lockdown in the Netherlands. The results of their study revealed that their students had a 3% learning loss which is equivalent to one-fifth of the school year. Losses are up to 60% larger among students from less educated homes.

The effects of online schooling on student outcomes during the COVID-19 pandemic will take time to fully understand but early evidence is not reassuring. Backer-Hicks et.al, (2021) find that school-related Google searches rose at the beginning of the pandemic in wealthier areas as compared to searches in low-income areas. These Internet searches indicate an effort put forth to substitute for loss of in-person instruction (Hinrichs, 2021).

Research conducted by Bozkurt, et al. (2020) examined the impact of COVID-19 on education in 31 countries. The researchers highlighted major themes due to the interruption in education such as 1) the inequity of the digital divide, 2) the need for alternative assessment and evaluation methods for both synchronous and asynchronous learning, and 3) the use of online proctoring services as a way to control cheating in the online environment.

3. METHODOLOGY

This study was conducted at two small mid-Atlantic Universities during the Spring 2021 semester (March to May 2021). The research adopted a quantitative methodology to assess how student / faculty trainings and availability of resources impacted students' final grades when they were suddenly moved to online learning during the COVID-19 emergency pandemic. The population for this study included all students aged 18 and over at both universities. One hundred and thirty-nine students responded to the survey, which was conducted using Survey Monkey, an online tool used to gather and organize data. The dataset was imported into a statistical tool, SPSS, for additional analysis that used Chi-square with a statistical significance of less than .05 margin of error and a 95% confidence level. The convenience sample surveyed students enrolled in courses from the School of Arts and Humanities, Business, Science and Math, Engineering, Computer Science, Computer Information Systems, Criminal Justice, and Psychology. The study explored the following two research questions?

RQ1: What impact did technology have on students' final grades during the COVID-19 Pandemic?

RQ2: How did the availability and accessibility of technology resources impact the students learning during the COVID-19 Pandemic?

The survey consisted of 20 closed-ended questions and one open-ended question for further understanding of students' experiences while moving to a remote learning environment during the COVID-19 pandemic. The first set of questions focused on background information about the students' gender, level of education, and school / department affiliation. The subsequent set of questions focused on the students' course delivery method during the pandemic, the LMS / tools available for the courses, and the trainings provided by the university to the students and faculty. The participants also answered questions on their performance in the course, availability / usage of technology, and impact on their learning / final grades in the semester. Lastly, the students had an opportunity to respond to an open-ended question on how the COVID-19 pandemic impacted their final grades.

4. RESULTS

All participants were asked a series of questions to understand their backgrounds which included their gender and level of education. Of the 139 participants, 60.4% were male, 37.4% were female, and 2.2% preferred not to disclose this information. Additionally, it was important to assess the level of education for the students to ensure that each level had representation. Based on the students who responded, 19.4% were freshman, 15.1% were sophomores, 24.5% were juniors, 29.5% were seniors, and 11.5% were completing graduate / post-graduate degrees.

Assessing how the students were impacted from the switch to remote learning required the researchers to analyze the delivery format of courses prior to the switch in learning. Early in the Spring 2020 semester, 46% of the students reported having at least one face-to-face course while 25.2% of students reported having at least one hybrid course that contained both face-to-face and remote learning components. These students were potentially impacted by the shift to remote learning as the core in-person instruction

of their course had to suddenly change. Over 75% of the student population reported that they were required to move to remote learning which aligns with the number of students who reported having some face-to-face instruction in their course delivery. It is important to note, that even though only 75% of the students reported a change to their learning mode, nearly all students were impacted in some way. It must be stated that 100% of students were taking online classes during the pandemic but 25% were fully remote prior to the lockdowns which resulted in 75% of students reporting the immediate move to online. For example, students enrolled in fully online courses had faculty members that still taught the traditional face-to-face courses. And while their fully online courses had been designed and unchanged during the pandemic, many faculty had to divert their time and resources to the converted courses which left limited bandwidth to collaborate with students in the unchanged online courses that were already in flight.

Switching to remote learning required the university and faculty to introduce new tools into their coursework. An important component to successfully transition students to remote learning is the training of faculty to teach remote classed and 54% of the students reported that their instructor seemed adequately trained for the transition while 46% believed that their instructors were not prepared for the move to remote learning. Students were asked which tools they used to bridge the gap with remote learning and the training they received for these tools. Of the participants, 62.6% used video conferencing tools, 32.4% used discussion boards, 2.9 % used collaboration tools, and 2.2% used phone calls. While these tools were incorporated in the students learning, 33.8% reported they received training on the new tools while 66.2% reported they did not receive training. A deeper analysis of the different tools and training provided for each is available in Table 1 located in the Appendices.

As students transitioned to this new environment, the university and external organizations provided resources to help ease the transition. Of the respondents, 92.8% of the students stated they had access to adequate technology to complete their course, while 7.2% reported they did not. Students were then asked to select the technologies that were used within their course and were permitted to select as many that applied. The results of this question can be found in Table 2 below.

Course Technology Needed	Percent of Participants
Computer	97.1%
Webcam	82.0%
Microphone	84.2%
Printer	31.0%
Internet	95.0%

Table 2: Course Technology

While it is assumed that the initial contact point for student assistance during this transition was the university itself, only 29.5% of the students stated the university did provide the resources while 70.5% stated the university did not provide any resources. Of the students who responded that the university did not provide the resources, 46.9% stated they had to purchase the technology needed to complete their coursework. To fill this gap, students were asked the funding source needed to acquire the required technology which includes the university, scholarships, relief funds, parents, job, other, or no funds were needed. Students who reported "other" stated alternatives such as nothing was provided, or they went through private loans to get the funding. The summarized results of this question can be found in Table 3 below. Finally, students were asked if acquiring this technology posed an undue burden (financial or otherwise), and 76.3% of the students responded it did pose an undue burden while 23.7% said it did not.

Source of Financial Assistance	Percent of Participants
University	2.9%
Scholarship	4.3%
Relief Funds	9.4%
Parents	15.8%
Job	19.4%
Other	3.6%
None Needed	44.6%

Table 3: Financial Assistance

The survey asked students a series of self-assessed questions to understand the impact COVID-19 had on their course and grades. The first question asked students if they did better in this new environment compared to their traditional face-to-face classes. Of the respondents, 32.4% reported they did worse, 36% stated they did not see a change, and 31.6% stated they did better. Subsequently, students were asked if the change in instructional delivery impacted their grade and 54% reported it had an impact on their final grade while 46% stated it did not have an impact. Since this impact could be either positive or negative, the students were asked to provide the level of impact from

extremely declined to extremely improved. Only 2.2% of students extremely improved, while 18.7% improved, 50.4% had no change in grades, 26.6% had grades that declined and finally 2.2% of student grades extremely decline. These results can be found in Table 4. Additionally, students had an opportunity to provide additional feedback on how the learning and course grade were impacted and their responses are summarized below:

- Extremely unmotivated to do class work combined with working during the week…
- It made learning harder for multiple reasons, but mainly the busy work became overwhelming.
- Honestly, I am just so burnt out and tired of looking at a screen.
- I feel as if I learned significantly less and my grades have declined.
- As far as learning goes, I feel like I learned nothing when moved fully online.
- A lot of the professors have never taught online and they didn't do a good job.
- Remote learning does not have the same level on engagement.
- Online courses are graded easier by far. The bar is set very low.
- The quality of the course material declined.
- Remote learning made everything extremely disorganized in every fashion possible.

Final Grade Impact	Percent of Participants
Extremely Improved	2.2%
Improved	18.7%
No Change	50.4%
Declined	26.6%
Extremely Declined	2.2%

Table 4: Final Grade Impact

While students' responses to these questions were an important aspect to understand how their grades were impacted, the researchers wanted to also analyze if there were any variables that were statistically significant with the impact on their final grade. The researchers found five variables that were statistically significant which included: doing worse in the new remote environment, having access to technology, having a computer needed in the course, the need for a webcam, and posing an undue burden on them. As expected, there was a statistical significance between the students' final grade and them reporting that they did worse in online courses. This had been a very difficult year for students and as the comments reported, students found it did pose an issue in their learning.

Two variables that show statistical significance answered the question of what technology impacted the students' final grades. As expected, using technology like a computer and a webcam had a direct relationship to the students' final grades. It can be assumed that the use of both tools keeps students more engaged in the course, less distracted, and able to retain more of what is being taught. Having a computer had a p-value of .024 for the Chi-square test, which fell within the range to be statistically significant. Many students who reported not using a webcam also commented that they felt distracted. The webcam had a p-value of .007 which also fell in the range to be statistically significant.

Also important was seeing if any variables showed a statistical significance related to the accessibility and availability of technology resources' impact on final grades. As one would expect, having access to technology had a statistical significance to the students' final grades. This variable had a p-value of .001 which not only fell within the range to be statistically significant but also was highly correlated with an impact on students' final grades. Students not getting the technology or just delayed in acquiring the technology, will certainly miss assignments or fall behind, thus causing a negative impact on their grades. Ensuring students have access would be a foundational component to their learning success. Secondly, the process of acquiring the technology causing an undue burden also had a high correlation with the impact on students' final grades. Specifically, this variable had a p-value of .012 for the chi-square test, which also fell within the range to be statistically significant.

5. DISCUSSION

Any swift change to our lives can be difficult but the more trainings and resources available to us can help ease the negative impacts of this transition. As the COVID-19 pandemic swept the nation in early 2020, many organizations underestimated its impact on their way of working. Some organizations simply needed to modify their business process to rely heavier on alternative methods that were already in use. However, for universities, the switch to processes such as remote learning seemed more impactful than they expected. Training the faculty and students and providing them resources for adapting to a modified learning environment needed to be handled carefully and with great

support. For some faculty and students, this was the first time they were entering a remote learning environment which warrants an entirely different design and implementation of instructional delivery plus a vastly different learning experience that adds a component of self-study to augment what we traditionally see as collaboration sessions in a traditional classroom. For this reason, it was important to understand what was available to students including trainings, resources, and funding to help acquire the needed technology to complete their coursework.

While the use of technology like discussion boards, video conferencing, and collaboration tools in pure online courses is not new, asking students who have never taken online courses to use these tools without proper training is a recipe for disaster. The study found that the two most-used tools were the discussion boards and video conferencing tools, yet only 33.8% of students reported that the university provided the training needed for this technology. With that number being so low, students would undoubtedly have trouble completing their coursework accurately and in a timely fashion. However, given the popularity of online courses, the researchers would find it hard to believe that the university did not have adequate trainings available for these tools. Likely the trainings were available, but students were not aware of where to find them or how to correlate them to their remote coursework. While subjective, 46% of the students reported that their instructors did not seem adequately trained for the online courses. Given that some instructors teach predominantly in a face-to-face setting and that the online learning delivery is vastly different, there is no doubt that the faculty members migrating their course content would likely struggle with this transition. This could explain why students felt the instructors were not adequately prepared.

Availability and access to the technology are two key components for student success in this modified learning environment. Fortunately, 92.8% of the students had access to the needed technology through some means. However, seeing only 29.5% of the students report that the university provided the needed technology was a bit discouraging. Luckily students were able to tap into a variety of sources, however, it is unclear if these sources were presented to the students by the university. In either case, the lack of university resources will certainly impact how students perform during this transition. While it can be understandable that the university provides on-site fixed resources like computer labs, the sudden requirement to shift learning remotely does require the university to intervene and ensure students are adequately prepared and have access to the needed technology. It is not expected that the university takes on the full financial burden, but many programs were available through government funding to help students with technology needs during this pandemic. It would be the university's responsibility to make students aware of these programs and help them in the process of applying and attaining funding for the needed technology.

Lastly, it is important to note that all students had some level of impact on their learning during the pandemic. This impact could be as minimal as their current online course instructor's limited bandwidth or as impactful like a financial burden causing students to either perform poorly or just withdraw from the university. For many students, this was their first academic year, or possibly even semester, and the abrupt change could be a demotivation to continue their higher education. Of the students who responded, 28.8% saw a negative impact on their final grade due to the COVID-19 transition. Ironically, 20.9% of the students responded they saw an improved impact due to COVID-19.

Fortunately, the open-ended question provided some additional context around the impact students faced. A few students did specify that their grades improved because they were forced to work hard and dedicate time to their studies. As a clarifier, one of these students commented that their grades might have improved because the instructors were more flexible and forgiving on grading during that semester. On the opposite side, students listed factors that led to their grades declining. The most common answer was being demotivated in the new self-paced environment as they did not have the drive to be successful while being so far removed from their instructor. A few students commented that the financial burden caused them to spend more time with their employers to pay for the additional resources. In turn, this caused students to have less time to dedicate to their coursework, which led to adverse effects on their final grades. Lastly, students also commented that they did not perform well in online courses as they prefer the face-to-face instruction since their learning styles require more direct and in person communication.

6. CONCLUSIONS

The COVID-19 Pandemic impacted organizations around the world and forced a new operating

model to be implemented, temporary or permanent, with their stakeholders. Higher education was not exempt and was forced to make quick adjustments to their instructional delivery to offset the social distancing requirements related to the pandemic. However, in doing so, universities must ensure that proper training and resources are available to students and faculty. If they are not made aware of these resources and supported in procuring them, then learning will be compromised.

This study found that resources were available internally and externally to the university, but students did not feel they nor their instructors had enough training to adopt the modified learning environment during the pandemic. A substantial number of students reported that they had an undue burden due to acquiring the needed technology and resources for their coursework. One might assume this would be financial only, but time is an element we must consider. If students are spending time on trying to attain funds for the technology, learning how to use the technology, or get frustrated because they are unable to follow through with procuring the resources, then inevitably, they are taking away core time that could be spent on instructional activities for their courses. The main take away is that while all training and resources could be available, universities should provide individualized attention, as needed, to ensure students are not only aware of what is available, but also able to easily procure what is needed. While we may not expect a future pandemic any time soon, at a minimum we should learn that awareness without support for instructional activity will likely negatively impact student learning in online environments.

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Appendices

Training Received	Collaboration Tools	Discussion Boards	Phone Calls	Video Conferencing Tools	Total
Yes	0%	8.6%	2.2%	23.0%	33.8%
No	2.9%	23.7%	0.0%	39.6%	66.2%
Total	2.9%	32.4%	2.2%	62.6%	100.0%

Table 1: *Student* Training versus New Tools Adopted

Variable	Chi-square Value	Significance Value
Gender	5.831	.666
Level of Education	21.218	.384
University Providing Training	2.417	.659
Worse Grade in Remote Learning	105.785	0.00
Access to Technology	18.187	.001
Computer Needed for Course	11.229	.024
Internet Needed for Course	5.352	.253
Webcam Needed for Course	14.053	.007
Acquiring technology posing an undue burden	12.795	.012

Table 5: Chi-Square Analysis with Impact on Final Grade