

The Impact of Online Learning on College Students

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

On March 11, 2020, the World Health Organization declared Coronavirus a global pandemic (World Health Organization, 2020). Shortly after, we witnessed the whole world change as staying at home, lockdowns, social distancing, isolation, and quarantine were imposed to control the spread of the infection. One of the most crucial parts of society, the education system, was directly impacted as they began to close in-person classes and transition to virtual learning. The United Nations Education Scientific and Cultural Organization (UNESCO) announced that in total, 290 million students across 22 countries have been heavily impacted by their education system (Kansal et al., 2021). While virtual learning is common for some masters programs and colleges that offer online classes, it was not seen as the main method of teaching in many colleges and the standard education system overall. Rezvan Nazempour and collaborators state that “the transition to remote teaching was stressful, since neither faculty nor students were completely prepared for this quick change, and the shift heavily relied on the ability to access or use online learning and teaching tools” (Nazempour et al., 2022, p.2). As teachers and school administration were faced with this challenge, they had no option but to plan a feasible online curriculum that can best cater to students' learning. Through the methods of synchronous and/or asynchronous online classes, teachers continued to deliver content to their students. While teaching was still able to take place, the quick transition to online learning did not give students or teachers significant time to assess the effectiveness of their online platform and teaching methods.

While the transition to online learning as a result of COVID-19 outbreak may change the learning methods from face-to-face courses to online and hybrid courses using digital

technologies, Hiltz and Turoff (2005) argue that the evolutionary changes in educational technology will be seen as revolutionary changes in higher education as we have been in the process of moving to online and hybrid courses. Over the years, online learning has begun to become a substitute for traditional face-to-face classes. Considering this shift, it's important to assess the impact it has on students and the roles teachers and administration play. In addition to the impacts of online learning, student's are faced with certain barriers such as socioeconomic, learning/physical disabilities, isolation, personal home issues, etc that need to be addressed in order to best support all students in a virtual environment. Furthermore, determining technological innovation and online platforms that can enhance learning is crucial in increasing the effectiveness of online learning. This STS research will focus on evaluating the effects of online learning mentioned above as well as technological innovations that can help amplify college students' learnings in a virtual environment. Analyzing and understanding the impacts of online learning on college students will display ways that society can continue to make enhancements in virtual education so that the needs of students are met allowing them to excel in their academic performances.

Social Construction of Technology (SCOT)

The Social Construction of Technology (SCOT) approach developed by Pinch and Bijker is a framework using different social groups to understand the meaning of technological developments (Pinch, 2009, p. 46) . It provides a way of understanding the success and failures of technology based on the social impacts. A SCOT model will be used to understand the impact of online learning on relevant social groups, the concept of interpretive flexibility, and closure. The relevant social group will consist of different groups that are impacted by the artifact which

is online learning. The concept of interpretive flexibility is the distinguishing features and different interpretation of online learning by various social groups. Lastly, closure will assess the point of agreement of the relevant social groups about the solutions proposed to help mitigate the impacts of online learning.

Social Groups

The relevant social groups to this research consist of college students, professors, and administrators. The main negative impacts online learning has had on students is the technical problems and lack of motivation, engagement, and social interaction. Online learning provides lots of flexibility for students, however, if students are not self motivated this flexibility can make it difficult for them to remain active in their learning. Professor's were required to adapt quickly as they needed to reconstruct their teaching methods so they can still deliver content to students. In a study conducted by Garcia-Morales et al. (2021), professors stated that the main struggle they had was to acquire the necessary skills such as computer knowledge and online teaching tools so they could redesign their curriculum for online teaching. While professors struggled with technical aspects, they were leaning on administration for instructions. University administrators are responsible for the planning, implementing and supervision of online learning (Schwanenberger et al., 2021). In a study conducted by Zincirli (2021), the main issues school administrators face during online learning includes technical inadequacies and planning deficiencies. Understanding the main issues mentioned above that each group has with respect to the artifact of online learning is critical in the improvement of online learning.

Many of the issues seen in the relevant group (students, professors, and administrators) stems from the inadequate time and preparation resulting from the quick and forced transition to online learning as a result of the pandemic.

Interpretive Flexibility

When discussing the alternative usage of online learning, students, professors, and administration have different responsibilities and therefore have different struggles. The main challenges students face in an online learning environment are technical difficulties and lack of motivation, engagement and social interaction (Anthonysamy, 2021). Addressing these problems will contribute to the development and improvement of online learning. Among professors, the main struggle seen is the lack of technological skills and knowledge about online teaching tools (Nambiar, 2020). While administrators are responsible for ensuring a functioning education system through different aspects such as monitoring, supervising, and planning, there are still difficulties they face when it comes to online learning. The main challenges seen among professors as mentioned above includes technical inadequacies and planning deficiencies. Similar to students and professors, administrators need technical support. Micheal Schwaneberger discusses one administrator who stated that they “wished for a “cheat sheet” of most frequently used technology operations in navigating the online classroom” (Schwanenberger et al., 2021, p. 8). Understanding the different usage and interpretation of online learning will allow schools to design a curriculum that can be impactful to all social groups.

Closure

After addressing problems of online learning faced by different social groups, it's important to address ways that online learning can become accepted within the groups. Closure in the SCOT approach is the point of agreement among the social groups about solutions. The optimal solutions proposed below can help different groups approach an agreement on the interpretation of online learning.

Student Needs in Online Learning

To help support the lack of motivation and engagement students need to be exposed to metacognitive strategies. "Metacognition can be referred to as "thinking about thinking" and it is about how an individual knows what they know" (Anthonysamy, 2021, p. 2). Students with metacognitive thinking skills are able to "deal with their learning and its execution through managing thoughts, assessing learning, and evaluating the time required for study through the use of appropriate strategies" (ibid. p. 2). The three metacognitive strategies that need to be used in the learning process to improve student motivation and engagement are planning, monitoring and regulating. Planning strategies involve students skimming through online materials before they tackle the task and planning their timing efficiently when it comes to completing assignments. Students who are able to utilize planning strategies tend to manage their time better with assignment submission and remain engaged in their learning ultimately leading to better learning performance. Monitoring activities consist of students setting goals, optimizing attention and focus, tracking progress in their online activities and self-testing the knowledge they are learning online. When students are able to monitor their learning they have awareness about their level of knowledge and understanding as it provides self feedback on what they know and where they should increase their focus. Regulation strategies ensure that students are self reflecting on

their learning progression through self-check questions and goal-attainment (Anthonysamy, 2021). Student's need to be taught to use these strategies so it's essential for teachers to encourage and support these strategies.

To address the lack of social interaction students feel in an online environment, Microsoft Teams is also an online platform that can be utilized to increase communication for online learning as it allows you to participate in meetings and conversations (Jaradat and Ajlouni, 2021). It's critical for teachers to understand the challenges students face from lack of interaction in order for them to be intentional about interaction in their teaching methods and course design.

Lastly, one of the biggest challenges seen among many individuals during online learning is the technical issues. This challenge can be mitigated by providing training to students to enhance their technological skills, providing technical support and videos to guide students on how to use the online system and solve common technical problems encountered (Jaradat and Ajlouni, 2021). Addressing the challenges that are common among the majority of the students will contribute to the improvement of student learning as well as increase the effectiveness of online learning.

Professor Needs in Online Learning

As mentioned above, administrators need to prioritize providing adequate technological training for teachers in a variety of areas including, computer navigation/knowledge and methods of conducting online learning (Nambiar, 2020, p. 10). When professors have the exposure and training using technological tools, it will help them plan an effective course curriculum that will

enhance students' learning and performance. Increased training on computer skills will allow professors to explore and implement innovative teaching methods (Nambiar, 2020). As professors also need to adjust to online learning, it's essential that they have the necessary support needed. "Some types of institutional support come from specialized departments that guide faculty on instructional design to develop their courses, the use of a learning management system (LMS), and even allowing faculty to "get their feet wet" by acting as students of online courses before they become the instructors" (Schwanenberger et al., 2021, p. 4). For professors to be able to best design their curriculum for online learning, it's important to understand how online learning impacts students. By providing professors with the necessary technological and administrative support they need, they will be able to provide an effective curriculum for their students.

Administrator Needs in Online Learning

Providing administrators with the technological knowledge needed to navigate online classrooms will provide them the knowledge needed to help successfully facilitate the virtual learning environment. In addition to providing administrators with technical knowledge, they need increased support and patience from the IT department as they learn how to navigate the systems. Additionally, once administrators are familiar with the system and IT support, they can pass that knowledge along to professors and students and guide them through these challenges (Schwanenberger et al., 2021). As administrators have experienced emergency online learning during the pandemic, they are better equipped to plan for continuous online learning.

Understanding the needs of students and professors in an online environment and working to

cater to those needs will help facilitate the planning process to ensure a successful online educational system.

Literature Review

Researchers have analyzed the integration of online learning in higher institutions as colleges and universities were compelled to transition from face-to-face teaching methods to online. These authors assessed the positive and negative impacts of online learning on students, the impact on their academic performance, and barriers college students are facing making it challenging for them to succeed in online learning.

Positive Impact among College Students

Ana Patricia Aguilera-Hermida explored college students' perceptions of their adoption, use, and acceptance of emergency online learning due to COVID-19. The three positive changes that students experienced after the transition to online learning were increased family time, personal improvement, and new activities (Patricia Aguilera-Herminda, 2020). In the study, students reported that they are able to spend more time with their family and pets which has been beneficial to them. In addition, they have had personal improvements consisting of self-care, personal growth, managing their own time, financial benefits and increased sleep. Online learning has pushed some students to become "self-directed learners pursuing certifications or trying to learn a new language" (Patricia Aguilera-Herminda, 2020, p. 6). Students also report that they have gained new technological tools such as navigating Zoom and soft skills including organization and discipline. Lastly, students state that they have had more time to explore new activities including writing poetry or exercising. They are able to invest in their hobbies and

explore their creativity. Another study about the evolution of online learning by Hiltz and Turoff (2005) discusses how one of the values of online learning to students is the flexibility of being able to incorporate education with demands of work and family. Online learning gives students flexibility to learn at their own pace and schedule as they balance other commitments and aspects of life. This flexibility reduces the constraints and stress that comes with a tight class schedule.

Danny Doucette, Sonja Cwik, and Chandralekha Singh (2021) researched students' reflections on different aspects of online learning through the use of interviews and surveys. When students were asked about their lecture based classes in remote learning, the biggest advantage students had was the ability to rewatch lectures. They found that students appreciated “the ability to go back and look through the recorded lectures when having difficulty understanding the concepts that need further clarification” (Doucette et al., 2021 p.3). In addition to students' abilities to rewatch lectures, online lectures provided students with an opportunity to clearly hear the professor as well as see the slides/ writing on the board better. Students were also able to improve their sleep schedule since the responsibility of commuting to classes early in the morning was no longer a concern.

While the literature referenced above tend to point out some positive impacts of online learning on college students such as flexibility, increased skills and accessibility, it's hard to determine long-term benefits because the reports made from students happened during an emergency online delivery method due to covid rather than an appropriately planned online instruction curriculum (Patricia Aguilera-Hermida, 2020).

Negative Impact among College Students

Patricia Aguilera-Hermida also assessed challenges and negative impacts of online learning on students during the pandemic. The three main challenges found were situational and environment challenges, online education challenges, and emotional challenges. When discussing situational and environmental challenges, students reported that it was difficult to concentrate at home due to lots of extra noise and family members. The home environment is also seen as a relaxation space for students. One student stated, “I work better in a separate environment from home. I associate home with resting, so having to be productive at home has been difficult” (Patricia Aguilera-Hermida, 2020, p. 8). Environment plays a prominent role in students' education. When students are expected to learn in their home environment where their family members are participating in their day to day life, it makes it difficult for students to remain engaged and focused on school.

Another difficulty students faced was the online environment. Starting at screens all day left students burnt out. Additionally, their professors were not familiar with online tools so this ultimately reduced the quality of learning. In Patricia Aguilera-Hermida's analysis one student stated there was a “lack of educational value found in modified assignment structure, I felt like I wasn't learning at all” (Patricia Aguilera-Hermida, 2020, p. 5). With the transition to online learning happening immediately, there were not appropriate resources available to support teachers and students in this transition. Furthermore, students reported lack of motivation. One student stated that it was hard to “[find] the motivation to engage when you have not even gotten out of bed” (p. 5). With online classes there is no restriction on where to take your classes so students need to be intentional about the environment they choose to do their school work.

A study done by Isnaeni Anggun Sari and Muhammad Zulfa Alfaruqy on college students' perspective on online learning during COVID19 showed that two negative aspects among students were technical problems and psychological problems (Sari and Alfaruqy, 2022). With the pandemic causing a quick transition, students and universities were not prepared or equipped with the correct tools to create an effective virtual learning environment. Students were dealing with unstable internet networks, sudden electricity cut out and expensive data plans. Sari and Alfaruqy also found students lacking learning motivation along with being stressed and bored. These factors resulted in students finding it difficult to maintain focus, understand materials and remain engaged (Sari and Alfaruqy, 2022). Online learning also leaves many students to study by themselves which can leave them feeling lonely and lacking social interactions. Social support is needed for students to lean on their peers and instructors as they come across challenges in their studies. Students who are not self-motivated and tend to procrastinate will find online learning to be unsuitable for them.

Impact on Academic Performance

A study done by Manya Suresh and collaborators on the effects of remote learning on academic performance of undergraduate students shows that remote learning helps to improve academic performance (Suresh et al., 2018). This study suggests that time of sleep is linked to students' academic achievement and as mentioned in earlier studies above, one of the advantages of online learning is increased sleep for students as they reduce travel time and their learning is more self paced. Students claim they have an overall better academic performance and learning during interactive e-learning compared to traditional learning methods.

Patricia Aguilera-Hermida found that self-efficacy was a key factor in determining students' academic success in online learning. This study confirmed that “students who are confident in applying a variety of self-regulated strategies are more likely to accomplish their academic tasks” (Patricia Aguilera-Hermida, 2020, p. 6). The academic performance of students in online learning is dependent on students' attitudes. When students have a negative attitude towards online learning it tends to negatively impact their academic performance. However, students with a strong sense of self-efficacy were better motivated and had great success in their academic performance (Patricia Aguilera-Hermida, 2020).

Barriers College Students Face

While online learning can become suitable for all students down the road, there are currently certain barriers students have no control that are impacting their success in online learning. These barriers provide unequal opportunities for all students to succeed. A study was conducted by Bariculon et al. (2021) on barriers to online learning students faced in the time of COVID19. Some of the barriers discussed consisted of technological limitations and students' home conditions. When assessing the technological barriers, one out of five students did not have a computer and an identical proportion did not have reliable internet causing them to use prepaid mobile data (Bariculon et al., 2021). The increased technological cost that comes with online learning restricted students from having equal access to materials needed to succeed in their classes. In addition to technological barriers, while students have more time to spend at home they found it difficult to concentrate because “they were constantly exposed to conflict among family members” (Bariculon et al., 20021, p. 6). Students have certain expectations at home such as being caregivers or simply just engaging in conversations with family members that took time

away from academic work. While the learning environment is online, the physical environment of where students take their classes remains essential to their learning.

Technological Innovations for the Improvement of Online learning

As universities continue to incorporate online learning in their curriculum they can enhance teaching and learning methods by utilizing emerging technologies. Augmented reality (AR) is an innovative technology that uses real-world camera images and virtual objects placed at specific points. The incorporation of virtual and real objects provides a unique learning experience in which a sense of reality is produced. Faruk Arici discusses how AR enhances students' activity and takes them into an individual learning environment. AR can help increase student interaction as they are able to experience certain aspects and products which are not available in real life (Arici et al. 2021). This can also enhance their learning by helping them understand complex concepts through three dimensional visualization. Another technological tool that can contribute to student learning is simulations/virtual labs. Simulations and virtual labs allow students to easily observe and engage with education content as they provide a presentation of real life phenomena (Leoste et al., 2021). Online learning requires the use of technological tools to host class/ deliver content to students. One way to facilitate remote learning is through the use of videoconferencing such as MS Teams, Zoom, and Discord . There are different ways these platforms can be used such as holding lectures, breakout rooms and virtual study rooms can be created in MS teams providing students with an alternative to a physical study room for them to receive assistance on assignments. Different teachers are able to supervise the room to make sure students have access to a teacher when they need help as well as promote students-staff communication and engagement (Mavengere et al., 2021).

Conclusion

The education system is predicted to continue transitioning to online learning (Kansal et al., 202). The transition to emergency online learning as a result of the pandemic showed school that effective online learning can be feasible with adequate resources and planning. Many of the negative impacts of online learning addressed above relate to the lack of preparation and support. This lack of preparation and quick transition shows the disconnect between relevant social groups. Providing students, administrators and professors with the necessary technological tools and resources such as technology handbooks they can use to solve common problems will help facilitate the process of online learning. Additionally, the school's IT support system needs to be easily accessible for all those in need so there is no disturbance in teaching or learning. To accommodate for the lack of interaction that both students and professors experience, online learning tools can be used to mimic physical classrooms through creating virtual learning spaces with accessible teachers. When assessing the positive impacts remote learning has on students, the flexibility provided will allow students to gain understanding and responsibility for their own learning which is crucial for self development beyond their educational years. While there are many challenges associated with online learning, addressing the needs of relevant groups and utilizing innovative technologies will enhance teaching and learning experiences.

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