Online and Blended Learning: Non-Access Problems

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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

The internet has become more and more useful as the number and quality of resources it contains continues to increase. This is relevant to education systems, as people tend to learn in different ways and at different paces, so increased access to quality resources could serve to mitigate the effects of these differences by offering additional learning avenues. Over the past several decades, this has led educators to search for ways to utilize the internet in the classroom. By the 2006-2007 academic year, over a quarter of higher education students were taking at least one online class and, by 2009, 45 states had at least one online program offered in K-12 school systems (Allen & Seaman, 2010; Watson et al., 2009). Furthermore, studies have found that online and blended learning models are as, if not more, effective than traditional in-person models (Means et al., 2013). These findings suggest a shift towards online and blended learning; however, it is crucial to consider the individual impacts on students to ensure they are all being treated fairly under these models.

Transitioning to online and blended learning changes how students receive content and complete assignments. Instead of only needing to complete assignments outside of class, these models also generally require students to learn material on their own. This exposes them to problems with accessing a comfortable environment, necessary devices, device repairs, and the internet. It should be noticed that all of these *access* problems pose much more of a challenge for underprivileged students, which could potentially exacerbate educational inequalities. Research has frequently focused on these access problems, and there are many public and private organizations working to help students attain device and internet access. However, the more nuanced *non-access* problems have not yet received the same amount of attention.

Access problems can be seen as barriers to entry to online and blended learning, as students without access to the necessary items do not even have the ability to participate in these models. Non-access problems, on the other hand, are the problems that arise in these learning models once those barriers have been overcome. These could include students' ability to regulate their time effectively, their ability to use the required online tools as intended, and the online tools being adequately designed to fulfill their purpose. For example, a student with access to the internet and necessary devices still must manage their time well and be capable of using online platforms. Unfortunately, certain students are more likely to be deficient in these areas, for instance, underprivileged students who grew up with little technology at home. These students may often spend more time learning to use online tools than their privileged counterparts who grew up with more technology. Thus, the goal of this research is to investigate non-access problems in online and blended learning and their dispersion across different levels of privilege.

Background & Context

Means et al. (2013), a comprehensive meta-analysis of 45 studies relating to student success in online and blended learning models, found with statistical significance that purely online models were as effective as in-person models, and blended models were more effective. They had a strict inclusion criteria for selecting studies, a very thorough analysis, and, subsequently, very strong results. So, it can easily be understood how education systems could use these results to motivate implementing online and blended learning. However, it was also found that, within these blended models, the effectiveness was specific to those with expository or collaborative pedagogies, as well as those with a significant difference between the online and in-person methods of instruction. So, it is possible that the positive effects on student success

were mainly related to the pedagogies used in the blended models. In other words, the online portion of the blended models often offered a different way to deliver content, giving students further opportunities to understand it if the in-person method of delivery was inadequate. This offers a more flexible approach for learning, which may have been why it was found to be so effective, rather than some feature inherent to learning online. Though, even if that is the case, it is still a potentially useful tool that teachers can use to add more flexibility to their students' educations.

The theory of appropriate technology, often associated with Mahatma Gandhi, provides a framework for understanding when online and blended learning models should be implemented (Bakker, 1990). This theory advocates for technologies that not only fulfill their intended purpose effectively, but also consider social implications, promoting sustainable and people-centered solutions. In education, it can be reinterpreted with a strict adherence to equity, ensuring that implemented learning models are to the benefit of all students. Therefore, if an online or blended learning model does not perform as well as a traditional in-person model for any student, it would be considered inappropriate under this theory to require students to participate in it. This stringent approach ensures that new learning models are to the benefit of all students.

In recent years following the start of the COVID-19 pandemic, a major negative of online and blended learning models became apparent as schools were forced away from in-person instruction as to prevent spreading of the virus. They scrambled for ways to adapt to this, and, in the U.S., the most common approach was purely online instruction where students accessed their lessons on the internet from any remote location. This addressed the concerns that the virus presented, but placed many underprivileged students into especially difficult situations. For example, some students in Hartford, Connecticut, had to go to a local McDonalds just to get

access to the internet to complete their assignments (Mayes, 2020). Those students had to put themselves in a position that is much more uncomfortable than going to school just to get their work done, while more privileged students were able to work from the comfort of their homes.

Bonal and González (2020) researched problems that arose with purely online learning during COVID and found, as before, that underprivileged students disproportionately were the ones facing them. To quantify the "fairness" between the education of different students, they developed an opportunity-to-learn (OTL) index. Students with better educational opportunities would have a high OTL index and vice versa. They were able to show that the OTL index was negatively correlated with public funding and positively correlated with parental education and income, as well as that parental income was positively correlated with access to electronic devices. For public funding, this can be interpreted as private and private subsidized schools offering better online learning models than public schools. For parental education and income, it can be interpreted as students having less access to devices and their parents having less ability to help if they encounter difficulties. So, a student at a public school from an uneducated and impoverished family would tend to have a low OTL index, clearly showing how underprivileged students face more challenges in purely online learning than privileged students.

In the case of COVID, the use of online learning may have been appropriate due to the greater societal concern of public health. However, now that the pandemic has subsided, it serves as a great example of what can go wrong when students are forced into using more technology than their personal background comfortably enables.

Most of the problems noticed during COVID relate to access, such as accessing a place to work with internet connection or accessing necessary devices. However, these are problems being widely addressed by public and private organizations, such as the Office of Educational

Technology, the National Digital Inclusion Alliance, and EveryoneOn. So, this begs the question, what problems remain for students when these access problems are overcome? Furthermore, the disparate spread of access problems between privileged and underprivileged students leads to the follow up question of, do non-access problems exist equally across different levels of privilege? Making strides towards answering these questions will allow for an examination of the appropriateness of online and blended learning.

Methods

To investigate the aforementioned questions, a deeper analysis of the literature on online and blended learning models was performed to identify common non-access problems. Then, an analysis of literature on broader social issues related to these problems was performed to draw inferences about how common non-access problems are dispersed across students with different levels of privilege. Lastly, the appropriateness of online and blended learning models was evaluated in the context of the two analyses.

There are many studies on online and blended learning models, but they have a tendency to focus on access problems, only briefly acknowledging the non-access problems that were observed. From a single study, this makes it difficult to determine the non-access problems that are most prevalent. However, when drawing from many studies, this task becomes much more reasonable as the non-access problems that frequently arise across different studies can be assumed to be the most common. So, many studies that acknowledge non-access problems were investigated to identify those that are most common.

With the common non-access problems identified, studies that address broader social issues related to them were researched to determine who they most commonly affect. This was

then used to infer the characteristics of the students that most frequently face the common non-access problems. For example, if it was found that digital literacy is a common non-access problem, then studies on digital literacy would be investigated. From them, it may have been found that students with higher income are associated with higher levels of digital literacy. This would lead to the inference that students from low-income families may tend to have lower levels of digital literacy, and thus be more affected by non-access problems. This methodology does not allow for concrete inferences to be made, as it attempts to relate independent studies, but it does allow for considerations outside the scope of existing literature to be made.

Identifying the common non-access problems associated with online and blended learning models and inferring their dispersion across privileged and underprivileged students allows for an examination of their appropriateness. It is used to highlight the primary inequities found in these learning models and provides considerations that should be made when implementing them.

Results and Discussion

Rasheed et al. (2020) reviewed many studies related to online and blended learning and identified common challenges from the perspective of students, teachers, and educational institutions. For the students' perspective, they sorted challenges into five inductive categories: self-regulation, technological literacy and competency, students isolation, technological sufficiency, and technological complexity. With the exception of technological sufficiency, all of these relate to non-access problems; however, there is considerable overlap between the sub-categories associated with them. For this reason, they are sorted into two types of problems for the purpose of this research: technological and self-regulatory.

Technological problems are characterized by students' struggle to use online tools as expected. These can arise both from students' lack of digital literacy, as well as poor design of online tools. Self-regulatory problems have to do with the challenges that arise from the increased freedom that online and blended models afford students, which most frequently relates to effective time management.

Technological problems

The primary technological problem in online and blended learning is students' struggle to effectively use online tools, which is a significant barrier to learning engagement and success. This issue is multifaceted, involving the inherent complexity of online platforms and the digital literacy of students.

Research by Prasad et al. (2018) highlights a common complaint among students about the complexity of technologies used in their education. They often find themselves overwhelmed by advanced features of learning management systems and other online tools. Rather than facilitating learning, this ends up consuming significant time as they navigate these complexities, often with excitement and distraction caused by new features. This can lead to them focusing on the technology itself, rather than the learning content, which inappropriately shifts their educational priorities. Wang et al. (2015) pointed out that the blended learning literature often suggests educational institutions frequently update their online tools, but this ignores the previously mentioned concern, often leaving students unable to keep up with the updates without spending an excessive amount of time learning and/or being distracted by them.

Beyond overly complex online tools, technological problems also relate to students' basic digital skills. Safford and Stinton (2016) found that students often lack digital reading and note-taking skills, as they are more accustomed to in-person learning, where these skills are more well

refined. Relearning them for online and blended learning models is not necessarily straightforward, especially due to students frequently not being familiar with basic computer operations and shortcuts, such as downloading and naming files, searching PDFs, working with compressed files, etc. This poses a challenge for these students as, once again, they are put in a position to spend a significant amount of time learning to use technologies rather than learning the content that the technologies are supposed to facilitate.

Gonzales' (2016) technology maintenance theory provides a useful framework for understanding who may be most affected by these technological problems. It says that most of the impoverished U.S. has gained access to the internet and adopted digital technology, but their access is unstable and frequently interrupted. This makes those affected appear as if they are in a position to properly utilize technology to improve their lives, but their inability to reliably use it leads them to be more skeptical with deeply integrating it, which is when the benefits become most apparent. Gonzales (2017) used this theory to study the technology usage patterns of university students, finding that they are characterized as "coping with the inevitable", where their device and internet usage is restricted due to expected interruptions. This highlights the importance of considering students' internet usage patterns when trying to determine those who will see the worst effects from online and blended learning models.

Zhang (2015) illustrates this issue vividly by comparing internet usage patterns across different demographic groups. The study found that Black, Hispanic, and Disabled students were less likely to engage with educational resources like Khan Academy and more likely to consume entertainment content such as Cartoon Network. It also found that Khan Academy viewership is positively correlated with income and the National Assessment of Education Progress's (NAEP) performance metrics, while the opposite is true for Cartoon Network. This suggests that the

internet usage patterns of certain underprivileged and low-income students reflect less focus on educational content, which could be a sign that they are deriving less digital literacy from their technology usage.

The reviewed literature collectively underscores a significant challenge in online and blended learning models: the ability of students to effectively utilize technological tools. This challenge is compounded by the rapid pace of technological changes, the complexity of digital tools, and inadequate digital literacy among students.

Crucially, the impact of these technological barriers is not felt equally across all student groups. Underprivileged students, in particular, appear to struggle more with unstable technology access and less engagement with educational content, showing that online and blended learning models may not be appropriate when these problems exist. This inequity points to the need for online and blended learning models that address technological proficiency across diverse student populations to ensure that they are appropriate for implementation.

In conclusion, improving the design of online educational tools and the learning models that use them to account for inequities in digital literacy are essential steps towards mitigating the technological challenges in online learning. By focusing on these areas, educational institutions can implement online and blended learning models that are appropriate for all of their students.

Self-regulation problems

Another significant challenge within online and blended learning models revolves around self-regulatory problems, particularly those relating to time management. This section explores how they manifest in various forms under these learning models and examines the broader implications they have on student performance.

The tendency to procrastinate is prevalent across all student performance levels in online and blended learning, which impacts how and when students engage with course content. AlJarra et al. (2018) provide insight into this phenomenon through their study of a hybrid computer science course. They observed that low, medium, and high-performing students all procrastinated, accessing course content with the greatest frequency when deadlines were close. The notable difference between the performance groups was that high-performing students were accessing the course content more heavily than others. This suggests that the amount of times course content is interacted with is a more important factor towards student performance than procrastination habits.

Broadbent (2017) found very similar results in their study, where effective time management was the most significant predictor of student performance in online and blended learning. Effective time management encapsulates procrastination and the amount of time spent accessing course materials, so its importance reinforces the results from AlJarra et al. (2018) by further showing the effects that students' time management strategies have on their performance under online and blended learning models. Successful students tend to be able to manage their time such that they can put significant effort towards assignments, even if the deadlines are nearby.

Research by Steel (2007) and Lu et al. (2022) confirms that procrastination is a widespread issue, affecting many students across all demographics and learning models. However, it should be recognized that online and blended learning models give students the ability to procrastinate on their assignments and on viewing course material, while traditional in-person models only allow for procrastinating on assignments, as lectures are delivered synchronously in-person. This additional flexibility, while beneficial in providing a tailored

learning experience, also requires students to possess or develop strong self-regulatory skills to manage their time effectively.

The reviewed literature paints a picture of the main self-regulatory problem faced by students in online and blended learning models, which is time management. These models require more autonomy, which puts more reliance on students' ability to access course content with appropriate frequency and at appropriate times. This added reliance has the potential to exascerbate procrastination, which has been found to be a pervasive problem for students across all demographics and performance levels. Without proper implementation that seeks to reduce the opportunities students have to procrastinate, these models may not be appropriate.

Poor self-regulation significantly hinders the effectiveness of online and blended learning models, as the increased flexibility they provide requires students to employ a higher degree of self-discipline in their time management. To be implemented appropriately, these learning models should encourage timely engagement with course content to ensure that students can fully benefit from the opportunities they present. By addressing these self-regulatory challenges, educational leaders can enhance both student experience and academic outcomes in online and blended learning.

Conclusion

Throughout this research, the most common non-access problems in online and blended learning models have been investigated: technological and self-regulatory. These findings highlight the diverse and sometimes disparate experiences of students in these learning models and underscore the importance of addressing both access and non-access problems to ensure equitable educational opportunities and appropriate implementation of learning models.

The investigation revealed that technological problems, such as difficulties in using online tools effectively, are major barriers that can impede student learning. These issues are often compounded by inadequate digital literacy and are more pronounced among underprivileged students. Moreover, self-regulatory challenges like procrastination and poor time management also affect learning outcomes, with them being prevalent across all student demographics, but can be especially detrimental in online and blended learning due to their additional reliance on students' time management strategies.

The theory of appropriate technology, as applied in this study, argues for the adoption of technologies that not only fulfill their intended educational purposes, but also result in positive outcomes for all students required to participate in them. Our findings suggest that current online and blended learning models often fall short of this ideal, particularly for underprivileged students who face the greatest hurdles with technological problems.

The main limitation of this research is in the small number of studies that focus on non-access problems. Future research should look to gather empirical evidence to verify the findings. For technological problems, the relationship between digital literacy and levels of privilege should be examined more closely to see if the inference made, that underprivileged students have lower digital literacy that leads to technological problems, is true. For self-regulation problems, the time management strategies employed by students should be investigated across online and blended learning models to see if they truly tend to be worse when compared to those of students under in-person models.

Online and blended learning models hold tremendous opportunity to provide flexible learning opportunities worldwide for students of all ages. However, this potential can only be fully realized if the technologies used are accessible, user-friendly, and supportive of all students'

needs, regardless of their background. As educational institutions continue to evolve and adopt these models more broadly, it is imperative that they remain vigilant about the inclusivity and effectiveness of them, as well as the potential contribution they can have towards ineffective time management strategies.

By focusing on the insights provided by the reviewed literature and continuing to explore the landscape of online and blended learning, educators and policymakers can prepare to meet the diverse needs of their student populations more effectively. In doing so, they will not only enhance educational outcomes, but also ensure that all students have the opportunity to succeed and thrive with the opportunities that the internet and technology are increasingly providing.

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