

“The Influence of Various E-Learning techniques upon Technology Acceptance and student engagement in differing Classroom Environments”

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Abstract

The impact of technology is becoming increasingly relevant in its everyday use amongst a variety of different industries and practices. This most prominently includes educational systems and services. As a direct result of the on-going COVID-19 pandemic, the majority of students and educators have had to relocate unto online platforms. Therefore the implementation and acceptance of such technological resources has become widespread in its outreach. Through the understanding and usage of predictive theories presented in Technology Acceptance Models (Davis, 1989), research review processes have suggested that student acceptance, engagement and retention of such essential technological tools varies based upon factors adjacent to motivation. The influence of motivation and interest to partake in the technology presented to them as well as balance in activities and opportunities made available to them can directly impact a student’s perception of their capabilities and subsequently their performance within a learning environment. By understanding the factors which directly impact and influence a student’s motivation and perception towards education. This can further allow educators and creators to structure educational technologies and tools for students of all educational levels, backgrounds and capabilities in the future.

Keywords

Virtual, Learning, Technology, Acceptance, Education

1. Introduction

With the impact of technology becoming increasingly prevalent in its influence within the classroom, the necessity for technological intervention and integration has become vital in educational development throughout the world. This was especially noticeable during the inception of the COVID-19 pandemic. As families were obligated to optimize safety and precautionary measures over daily living practices and routines, many educational institutions have had to scramble to find alternative methods of supplying and supporting educational and learning processes for their students who were now obliged to stay home and maintain their safety and well-being (Lieberman, 2020).

With the unprecedented nature of the situation at hand, educational institutions found themselves taking additional expenditures to accommodate such purchasing electronic tools and finding web-based resources and literature to provide their students (McBurnie, 2020). Educators, regardless of their familiarity with the e-learning options and platforms were tasked with transferring their daily educational processes to a virtual classroom and meeting

atmosphere on short notice. Digital interventions and alternatives became key in supporting such shifts and different platforms which had not necessarily catered to education were not re-structuring their resources to accommodate the needs of society (Dalal et al, 2021).

While necessary shifts and changes in education were brought forth through digital means the user's perception of education was no longer at the forefront in terms of deciding how and which tools were best suited to provide education (Alhat, 2020). If students required additional support outside of the classroom, those resources became temporarily unavailable. School predetermined budgets were re-allocated in terms of expenditures which catered to the shift in need. Different students had to be accommodated based on their family's resources and socioeconomic status. While others, based on their physiological and developmental needs, had to be accommodated in other manners (Pitsoe & Letseka, 2016). Overall, to withstand delays which would prevent or disturb the development of students were often the most imperative notion in terms of the efforts made on behalf of the educational systems. Therefore students who are differently abled and require additional academic support had to reconfigure their approach towards their studies. This brought forth both areas of deficit and progress as the structure of the alternative educational processes did hold some benefit for different abled learners (Giebsers et al, 2013).

1.1 Objectives

While necessary shifts and changes in education were brought forth through digital means the user's perception of education was no longer at the forefront in terms of deciding how and which tools were best suited to provide education (Alhat, 2020). If students required additional support outside of the classroom, those resources became temporarily unavailable. School predetermined budgets were re-allocated in terms of expenditures which catered to the shift in need. Different students had to be accommodated based on their family's resources and socioeconomic status. While others, based on their physiological and developmental needs, had to be accommodated in other manners (Pitsoe & Letseka, 2016).

Overall, to withstand delays which would prevent or disturb the development of students were often the most imperative notion in terms of the efforts made on behalf of the educational systems. Therefore, students who are differently abled and require additional academic support had to reconfigure their approach towards their studies. This brought forth both areas of deficit and progress as the structure of the alternative educational processes did hold some benefit for different abled learners (Giebsers et al, 2013).

This study will observe the impact of different virtual learning methods that have been implemented through digital education platforms. It will further focus upon the implications and impact brought forth with the COVID-19 pandemic and how it has affected different educational practices and standards through asynchronous and synchronous approaches.

2. Literature Review

Within the United States of America, public education classrooms are already facing vast discrepancies in terms of classroom sizes, and financial resources, expenditures and diversity. For students who are considered to be developmentally disabled, differently abled and or atypical in terms of their learning process such areas of discrepancy are only further exacerbated (Luterbach, 2013). Sitting in large classrooms in which the ratio of students to educators are largely offset due to budgetary constraints and limitation of resources, can often hinder a differently abled student's progress and development in terms of their educational growth (McBurnie, 2020). Therefore the mandatory shifts brought forth through the pandemic could pose some benefit in terms of providing learners of different capacities and capabilities with the opportunity to achieve their full potential while also exemplifying to educators and administrators that different techniques and approaches to teaching could prove effective in the future and in the long run.

The growth and expansion of e-learning has often been exhibited in areas of educational supplementation and support. In previous years and analyses, e-learning has been established through software and tools which could help students based on their grade level and educational development based on attributes of their progress such as their reading level and math level (Kang, 2011). If a student were to struggle within a certain area of the curriculum, educators would refer families to purchase text or software in the format of CD roms which they could install and provide their child with practice outside of school. These similar educational tools were also made available to students within the classroom in their freetime and if additional support programs outside the classroom were made available (Capanni & Doolan, 2011). Students who received additional support in supplementing certain skills through tutoring and educational software use were noted to progress their deficits by integrating key concepts into a student's learning

by providing new, different and creative ways of teaching the same concepts as that which was covered in the course materials (McBurnie, 2020).

With such occurrences, educators as well as families began to note that supplemental tools, programs and software were providing a newfound element of support for learners who were otherwise struggling to attain the same information as their peers. Students who may have been diagnosed with learning disabilities such as dyslexia, attention deficit hyperactivity disorder (ADHD), Autism and or dyscalculia were now receiving additional support in manners which could not otherwise be provided to them through a traditional classroom environment (Lahiri, 2020). Students with dyslexia struggle with the perception of certain words and numbers which often make it challenging to understand at the same pace and perspective other neurotypical peers within their class. Similarly, those who were diagnosed with dyscalculia faced such challenges with numerical symbols and computation (Ludlow, 2015).

As global education efforts have grown to encompass tools such as Zoom, Microsoft Teams, Udemy and Masterclass to continue their curriculum, the newfound format of schooling has also shifted to accommodate the differences (McBurnie, 2020). Classroom sizes, albeit reflective of traditional, physically present classrooms were maintained in terms of the expected ratio of teachers to students, the hours in which classes occur have shifted to provide students with a break and accommodate family schedules as well (Kirby, 2021). Therefore, students who would otherwise have challenges sitting and attending in a classroom setting for long periods of time now have the opportunity to get up and rationalize their daily lesson and curriculum at a pace which is more comfortable for them to digest. This shortened structure and accommodating manner of curriculum delivery has been beneficial to students diagnosed with ADHD and or Autism due to the length of the lesson provided (Lahiri, 2020). This approach facilitates retention as students are able to concentrate upon bite-sized elements of the curriculum and allows students to take in what they learn and apply it throughout the lesson without having to continuously move on to the next task throughout their day.

Additional benefits brought forth by e-learning include consistency. By providing a scheduled time, location and insight into a lesson plan through email exchange and online learning platforms, students and their families can better prepare for their daily lesson at their own pace rather than one which is established based on a physical classroom setting in which the needs of multiple students must be considered (Kirby, 2021). Therefore, students who are on the autism spectrum benefit from such changes as they are allowed expectations, routine and structure within their daily classroom experience (Alromaihi, 2021). This is especially pertinent given that individuals on the Autism spectrum are often known to have rigidity in regard to sudden or newfound changes. Similarly, the personalization features brought forth by e-learning also provides students who are differently abled with the opportunity to better customize their individual learning experience based on what makes them comfortable rather than a classroom at large (Rodríguez Muñoz, 2016). This can be observed through different setting adjustments such as sound and lighting. As well as location and placement of where they are sitting (Kirby, 2021). By being able to tune in from home, students may feel less pressure in terms of seating and social obligations which are often enforced within the physical classroom environment and school settings.

3. Methods

With such benefits brought forth through e-learning platforms, the users of such technologies, which in this case would be the students, the acceptance and therefore the overall adoption of technology is increased. In terms of perceived usefulness (PU), items such as a login screen, video camera and microphone are all tools which allow a user to perceive the important terms pertaining to the adequate and appropriate process occurring within their tasks. For example, on both zoom the login screen may be accessed in multiple ways (Venkatesh, 2015). Especially if the user already has the software installed onto their computer and is accessing a specific meeting as a guest. Amongst the two different ways that the login screen can be accessed, a user may perceive it as simply logging in and entering the meeting link in the search bar. However, if they are invited by someone else, the user can access the same meeting or specific meeting by simply clicking on the link provided for them in the email which invited them to the event itself (Mirzamova, 2021). This is a format of perceived usefulness (PU) as the multiple entrance options conveys to the user that the accessibility features of the technology is making their job or their busy day easier to navigate (Hussain et al, 2016).

Another example of PU utilization in educational systems includes the video camera feature of the Zoom or Microsoft Teams video conferencing software(s). The video camera on/off option is both prominently featured in both the initial screen as well as the screens displayed upon entering the meeting. If users do not feel comfortable having their cameras on as they enter the meeting, they can simply turn it off and turn it on later after the events begin or as

they need to appear. Lastly, usage of PU is also noted in the microphone features of a Zoom or Microsoft Teams engagement or call as users have the option to have their microphone on or off as they enter a call or throughout the call as needed. This is both beneficial to the host of the virtual conference or meeting as well as the guest as it can eliminate unnecessary background noises and distractions for the other attendees.

In terms of Perceived Ease of Use (PEOU), items can seem easy or accessible in its usage based upon the efficacy it conveys to the user. This was observed in Bandura's theory of self-efficacy which suggested that users are more inclined to engage with a tool or process based on how autonomous the user felt through its usage (Bandura, 1989). Therefore, both Bandura's theory of self-efficacy and Davis's theory of PEOU, which came afterwards, are dependent upon the user's psychological determination and their own notion of independence from engaging with that tool and in their efforts towards completing a certain task at hand (Bandura, 1989). Such formats of PEOU can be observed in a variety of interactions. For example, reflecting back upon our Zoom and Microsoft Teams example, one could say that the multiple login feature that allows a user to enter a call-in different manner is useful because of the versatility it provides. However, when revisiting this item and constructing it from the perspective of "ease" we can observe how this specific item also provides the user with a sense of autonomy in their digital meetings or engagement (Davis, 1989).

4. Data Collection

Due to the nature of this study, being a research review, articles were referenced and sought after through keyword-based inquiries. Multiple search engines were consulted in efforts to draw sufficient information and relevant, peer-reviewed publications which would adhere to the topics observed in this review. Amongst the different database search engines utilized for such inquiries, Google Scholar, Scopus, World Wide Science, PubMed Central, PLoS One, ScienceDirect and Research Gate were consulted. Keywords such as "E-Learning", "Virtual Education", "Education", "Pandemic Learning", "Virtual Resources" were inputted to yield results which would cater to the objectives noted within this study. Upon establishing the keywords, different titles were cross referenced in terms of relevance to the objective for further review.

5. Results and Discussion

Amongst the three primary methods utilized in most virtual learning environments today, different approaches benefit different educational institutions based on their own unique structural processes and development. With the rise of unforeseen circumstances such as the COVID-19 global pandemic, education administrators have had to redevelop their approaches towards curating alternative classroom environments (Dalal et al, 2021). Synchronous learning environments provide students with a live approach towards their education. By providing students with real-time lectures and content engagement opportunities, it mimics a format of live, in-person classroom environments, allowing natural interactions between users participating in the overall discussion.

Benefits brought forth by this format include allowing the lecturer or instructor the opportunity to engage with their students and address any questions and concerns they may have right away (Gibson, 2012). It also promotes student engagement by providing an alternative method of attendance for those who may issue in appearing in the live classroom environment. In contrast to this, issues brought forth by this approach include ensuring that students have access to a quiet learning environment within their residence or living facilities that allow them to engage properly without any additional distractions. Furthermore, it may require the student to have proper technology and internet access to tune into the discussion as well. Students also have a limited opportunity to approach the class and or educational material at their own pace given the constraints of a timed meeting engagement (Giesbers et al, 2013).

5.1 Numerical Results

Due to the nature of this study, being a research review, numerical results were not observed.

5.2 Graphical Results

Due to the nature of this study, being a research review, neither numerical results nor graphical results were observed to understand the outcome.

5.3 Proposed Improvements

Social norms and expectations aside, by allowing the user to have the option to enter a meeting at their own ease, they are provided with an aspect of accessibility that allows them more opportunities to organize their approach

towards the technology itself. For the theory of planned behavior, in terms of partaking in digital classrooms and e-learning platforms, one could say that a relevant and important behavior worth noting is classroom engagement. This behavior is particularly interesting as it has shifted to encompass a digital environment and now useful tools such as the ability to mute one's camera and microphone can also deter them from engaging within the classroom or meeting overall (Venkatesh, 2015). While such features do provide the user with a sense of autonomy in regard to how accessible they want to be within a classroom environment, it can also deter their engagement with the overall conversation. The tools that provide them with ease can also hamper the discussion and their engagement within the virtual meeting.

5.4 Validation

For virtual learning environments that are not held within a live meeting time, asynchronous online learning environments provide students with the opportunity to engage with their academic experience at their own pace but within an allotted time frame (Strang, 2011). This format resembles those observed in online seminars and TedTalk videos, in which the instructor can provide a pre-established learning experience through an informative lecture or review. Benefits brought forth include a lack of a pre-established virtual conference or meeting and students can tend to their classroom obligations, assignments and exams at their own pace and timing within a certain timeframe (Pitsoe & Letseka, 2016). Tools such as discussion boards and threaded discussions can also provide students with an opportunity to exert their agency and autonomy while also taking visual and textual notice of their peers (Kirby, 2021).

6. Conclusion

Overall, the benefits brought forth by virtual education are those which provide long-term benefits to students simply due to the accessibility it provides. As technological devices were introduced to facilitate curriculum throughout the COVID-19 pandemic will not cease to exist as society moves forward (Lieberman, 2020). Rather it will become increasingly integral as students will become more equipped than ever in asserting their autonomy within their education. They will have more resources available to them, not just the ones that are made available due to their zip-code or which tax bracket their families fit into. Education is often depicted as privilege, while it can and should be treated as a fundamental necessity and right when it comes to the equity of every individual who wishes to access it (Rocco & West, 1998). Therefore, denying students an additional opportunity to access their education through non-traditional (or physical) means is denying them an opportunity to access what was theirs to begin with. While the benefits established by technology can also be illustrated as exponential or bountiful, it cannot be successfully implemented, especially for children, without assuring that their educators are not being left behind.

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