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IT leadership on classroom technology integration within higher education: a narrative review

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Abstract

Several studies have focused on the educational effectiveness of technology, with many institutions providing solutions to the classroom and virtual technology integration and implementation barriers. It is essential to eliminate barriers to technological integration. More importantly, stakeholders are responsible for identifying these obstacles or developing a model depicting successful implementation. Higher education IT Leaders, decision-makers, and educators are affected by technology integration barriers that are the focus of this narrative review. The findings of the narrative analysis revealed three emerging themes. (1). Barriers within technology integrations and implementations that are troublesome but solvable. (2). Obstacles within technology integrations and implementations that are more difficult and will require substantial effort to solve. (3). Impediments within technology integrations and implementations that are so difficult that they may not be within our power. There were 20 articles reviewed from the date ranges from 2003 to 2023, contributing to identifying the themes.

Keywords: IT leaders, integration technology barriers, technology integration in higher education, technology integration models, technology integration in the classroom

Introduction

The COVID-19 pandemic, as seen worldwide, caused a significant interruption in all aspects of human lives. More importantly, the educational sector encountered many challenges of schools and universities closing, and traditional education shifted to an online paradigm (Akram et al., 2021). The technology infrastructure is constantly changing but often overlooked in research regarding school technology (Lamb & Weiner, 2021). As one who has worked in higher education, there can be a disconnect between the staff in the IT Department and the faculty. The technical staff and faculty can establish better communication by building a one-on-one relationship. If the IT senior staff has an opportunity to teach, this will allow them to be more effective with technology integration in the classroom (Norbury, 2013). Faculty often learn technology skills and integration strategies through professional development. However, this may not be an effective means of professional learning due to experiences seldom transferred to instructional practices (Glazer et al., 2005). Therefore, what if the IT Leadership and other decision-makers for technology integrations within the classroom considered a process that will empower an instructor to obtain learning experiences within the context of their teaching so they can practice, reflect, and improve their practices? This process will bring about buy-in for the integration.

Problem Statement

IT Leaders and educators in higher education need to overcome the barriers to technology integration by utilizing a process that would effectively integrate technology into classroom instruction, improving the

student's learning experiences (Surry et al., 2005). More importantly, IT leaders, educators, and other technology decision-makers must examine the issues and barriers that inhibit faculty from using technology in their instruction (Abrahams, 2010). It is imperative to overcome barriers to technological integration. The responsibility is for stakeholders to focus on identifying those barriers or creating a model that depicts implementation as successful. Incorporating information technology into classroom instruction has increased student engagement and achievement; more importantly, it contributes to more effective dissemination of course content (Yeh et al., 2011).

Purpose of the Study

This study intends to identify critical themes on IT leadership in classroom technology integrations within higher education related to the barriers. The researcher will consistently address the following research question through the purpose and problem statement.

Review of Literature

Barriers to technology integrations and implementations

Several studies have focused on the educational effectiveness of technology, where many institutions are providing solutions to barriers to technology integration within the classroom and the implementation of technology. There are barriers within technology integration that are troublesome but solvable. Technology buy-in is critical for the stakeholders when making a meaningful change affecting the organization, specifically regarding technology integrations within higher education. More importantly, low buy-in from the stakeholders can cause technology integration failure within the organization (Kotter & Whitehead, 2010). Of course, this does not mean everyone's opinion will be accepted. However, it lets the decision-makers know the stakeholders' views when finalizing the ideas (Kotter & Whitehead, 2010).

The Covid-19 pandemic allowed us to witness that it is possible to see technological integration in all aspects of life. To provide students with more learning opportunities, using technology tools within the teaching and learning process is no longer a choice but a necessity (Basar & Sahin, 2022). In higher education, the technology utilized in the classroom and distance learning has evolved into a fundamental skill. Unfortunately, many professional development programs emphasize learning-specific technology applications instead of teaching faculty how to integrate technology in a subject-specific manner (Alenezi, 2017). Faculty community buy-in and integration will increase if they are permitted to continue training beyond a particular event.

One approach is for the institution to emphasize peer coaching, in which teachers of similar or equal status assist one another through problem-solving, observations, collaborative instruction, and planning (Alenezi, 2017). Alenezi also identified obstacles to using technology in the classrooms, which included access to resources, security restrictions, and the comfort level of using technology within instruction. Technology integration will be more successful for administrators, IT leaders, and other decision-makers if the faculty training program is effective (Dysart & Weckerle, 2015). While faculty professional development has contributed to overcoming barriers that many faculty within higher education experience; however, there are still limitations to consider (Castro-Guzmán, 2021).

Some barriers regarding technology integration are more difficult and may not be in the power of IT leadership to solve. Bureaucracy can be the most challenging barrier to overcome because these obstacles prevent IT Leadership from introducing innovative technologies (Abdul Razzak, 2020). More importantly,

bureaucracy can increase the difficulties in fulfilling educational demands (i.e., including training and coaching) related to integrating technology. This barrier can negatively impact education quality due to delays resulting from the bureaucratic process.

Munyengabe et al. (2017) identified the lack of teachers' teaching motivation due to financial concerns as one of the four barriers regarding technology integration in a school system in Rwanda. Further research focused on the internal and external barriers regarding technology integration (Hamutoglu & Basarmak, 2020; Kilinc et al., 2018).

The role of leadership within education has changed due to technological innovations. Moreover, the challenges that administrators, IT leadership, and other decision-makers face today differ from their predecessors mainly because of the factors that must be addressed regarding technology integrations (A'mar & Eleyan, 2022). Traditionally, technology integration courses are taught face-to-face (Ketsman, 2022); however, the pandemic has changed how education applies technology integration to include online learning as a modality.

Some studies have identified barriers that influence technology integration, whether in traditional or virtual classrooms. One of these barriers is the absence of a comprehensive vision for technology, which hinders programs designed to assist faculty in their use of technology due to the hectic schedule of the faculty; there is little time to learn new technology, especially if there is no support from the institution in which making time can be a challenge for faculty (Baronia, 2022). In addition, the role of artificial intelligence (AI) has altered how higher education approaches learning and sustainability (Bonini, 2020). AI technology has accelerated across many disciplines, especially as a writing tool. There is continued research on AI writing within education institutions, its effects on students' writing, and experimentation on GPT (Polonsky & Rotman, 2023; Elkins, 2020).

There are barriers within the technology integration process that are more difficult and require substantial effort to solve. A technology provider must do more than a traditional vendor; there is more excellent value if the vendor leverages their expertise with the platform and experience working with other institutions (Shaw & Kolodny, 2022). Vendors should be included in the integration process during the initial stages as this will help the IT leadership and other decision-makers better understand and, more importantly, be in a better position to address obstacles and incorporate best practices sooner than later implementing the technology, whether in a traditional or virtual modality. Other researchers (Ali et al., 2020) depict that poor communication between organizations and technology vendors hinders successful implementation and innovations.

Due to the evolving innovations of technological advancements, higher education has partnered with technology vendors to remain competitive (Jung et al., 2021). However, more importantly, these institutions have needed help keeping up with the technological advancements despite the increased usage of online learning (Ortagus & Tanner, 2019). When emphasizing technology over pedagogy, IT leadership and other decision-makers regarding technology integration will be able to focus more on the features of the technology (Okojie et al., 2006).

However, one should maintain sight of what is to be achieved through integration. When the instructor explores the relationship between technology in education and pedagogy, this will encourage critical thinking while practicing technology integration (Okojie et al., 2006). The rise of digital technologies has resulted in the development of digital classrooms, which have become highly significant but have also generated complex issues.

Methodology

Research Question

RQ: *What themes can be identified from reviewing critical articles about technology integration barriers that affect IT Leaders, decision-makers, and educators within higher education?*

A narrative review of studies regarding barriers within technology integrations and implementations was conducted to identify themes in the literature (Jones, 2004). For most of the articles identified from the critical articles in Tables 1-3, forward and backward citation searching were used to find many articles from education-related content. Articles utilized in this research were from the date ranges of 2003 to 2023. Also, relevant articles with empirical data or literature reviews were identified by scanning titles and abstracts from searching in Google Scholar, GALILEO, Pro Quest, SAGE Journals, ResearchGate, and IEEE Xplore with terms and phrases to include technology integrations within higher education, technology integrations within the classroom, barriers to technology integration, models for technology integrations and IT leadership, vendors and technology integrations, pedagogy, and technology integration. The inclusion criteria were that the abstract text includes relevant content, as judged by the sole researcher.

Data analysis

An iterative analysis using the constant comparison method (Glaser & Strauss, 1967) and (Ouyang et al., 2022) with no prior hypotheses to identify themes by the author. The contribution from 20 key articles were used to identify and group three emerging themes and one category along with a set of theoretical foundations to include: (1). Barriers within technology integrations and implementations that are troublesome but solvable. (2). Obstacles within technology integrations and implementations that are more difficult and will require substantial effort to solve. (3). Impediments within technology integrations and implementations that are so difficult that they may not be within our power to solve.

Results

There were 23 articles reviewed from the date ranges from 2003 to 2023. These articles reviewed are categorized as barriers to technology integration and implementation. There were 23 articles reviewed with a date range from 2002 to 2023 identified into Themes 1-3: (1). Barriers within technology integration and implementations that are troublesome but solvable. (2). Obstacles within technology integrations and implementations that are more difficult and will require substantial effort to solve. (3). Impediments within technology integrations and implementations that are so difficult that they may not be within our power to solve) to address the research question.

Theme 1: Barriers within technology integration and implementations that are troublesome but solvable

This first theme emerged from six research studies examining technology integration within school systems during the pandemic, the impact of professional development and technology integrations within higher education, attitudes toward technology, and technology agility enablers (Castro-Guzman, 2021; Keengwe et al., 2009; Lowther et al., 2008; Menton & Suresh, 2022; Uslu & Bumen, 2021; Zahra et al., 2020). Articles for Theme 1 are shown in Table 1. Even though the internet is widespread, only some students or faculty have the resources to use the technology. This issue may be connected to the ability to afford the internet or the availability in remote places (Zahra et al., 2020). Zahra et al. (2020) examined the significant impact of COVID-19 on students from rural areas in Pakistan. The authors used a qualitative approach

focused on the Higher Education Commission’s policy and internet access for rural students' educational services. Consequently, results indicated that a lack of internet service makes it difficult for rural students to continue their online classes, resulting in most of them dropping out of school. Lowther et al. (2008) examined the impact of a statewide technology program on 26 schools, focusing on student outcomes, skills, and teachers' attitudes toward technology integration. The results from the study used a mixed-method approach to study the integration of technology into the curriculum and instruction to prepare students to meet state standards.

Uslu and Bumen (2012) analyzed the impact of a professional development program on technology integration and attitudes toward Information and Communication Technology (ICT) in education. Results showed that the professional development program positively affected technology integration, whereas there was little or no change in ICT attitudes. Consequently, Keengwe et al. (2009) investigated factors influencing the ICT adoption process and implications for faculty development and technology leadership. Again, the academic and professional backgrounds of the research participants were diverse as they identified leadership, organizational support, training, and development as the primary themes that influence the adoption process of ICT within higher education. More importantly, the study provides insight into how leaders within higher education can assist their faculty and staff in implementing the appropriate technology tools and practices to enhance student learning.

However, Castro-Guzmán, (2021) revealed four main challenges to ICT integration in Higher Education: a collective cross-level development approach, an approach where problems or limitations are essential, a cultural appropriation of ICT, and the influence of power relations. Furthermore, integrating technology into teaching and learning is not an individual activity but an organizational activity that helps overcome faculty barriers and enable organizational conditions (Castro & Nyvang, 2018). Menton and Suresh (2022) identified eight technology agility enablers, with the pandemic as the most significant enabler, to promote technology agility in higher education. This study also revealed that government initiatives and institutional commitment are critical enablers in facilitating technology integration for higher education decision-makers, IT leaders, and educators.

Table 1: Articles reviewed to identify Theme 1

Author(s)	Year	Contribution
Castro-Guzmán	2021	Revealed four main challenges to ICT integration in Higher Education: a collective cross-level development approach, an approach where problems or limitations are essential, a cultural appropriation of ICT, and the influence of power relations.
Keengwe, Kidd, & Kyei-Blankson	2009	Investigated factors influencing the ICT adoption process and implications for faculty development and technology leadership.
Lowther, Inan, Strahl, & Ross	2008	Examined the impact of a statewide technology program on 26 schools, focusing on student outcomes, skills, and teachers' attitudes toward technology integration.
Menton & Suresh	2022	Identified eight technology agility enablers, with the pandemic as the most significant enabler, to promote technology agility in higher education.
Uslu & Bumen	2021	Analyzed the impact of the professional development program on technology integration and attitudes toward Information and Communication Technology (ICT) in education.
Zahra, Gul, Iqbal, Ghafout, & Ambreen	2020	Examined the significant impact of COVID-19 on students from rural areas in Pakistan.

Theme 2: Obstacles within technology integrations and implementations that are more difficult and require substantial effort to solve

The second theme emerged from the review of six articles from the total reviewed and is shown in Table 2. The studies reviewed for this theme included barriers to faculty buy-in and professional development. Due to poor design, faculty may find it challenging to learn a new technology: things do not function as expected, buttons do not correspond to the equipment they control, or settings are difficult to comprehend. Butler and Sellbom (2002) examined the factors influencing faculty adoption of modern instructional technologies, such as technological proficiency, barriers to adoption, and reliability. The results showed that faculty with high proficiency levels identified the same barriers as those with low levels. In contrast, technology reliability was listed as the main barrier. In addition, the degrees of proficiency with presentation software, graphics software, internet browsing, and spreadsheets were the most significant differences between the most and least proficient. Other obstacles included a lack of campus support, equipment that differed too much between classrooms, software incompatible with offices, classrooms, and students' systems, and a lack of time to learn new technology (Butler & Sellbom, 2002).

Further, faculty at higher education institutions have greater access to technology than ever before. They can educate college and university students who are accustomed to using it frequently in their personal lives (Polly et al., 2020). But obstacles still prevent technology from improving instruction. Polly et al. (2020) determined the challenges related to faculty members' use of technology in their teaching by looking at the views of faculty members, administrators, and technology support staff. The results showed that the main barrier was the time required to learn new technologies. Other barriers included figuring out how to teach with technology and managing tasks between concentrating on teaching and other work duties, whereas research was a part of their job (Polly et al., 2020).

Ghazi et al. (2013) focused on the problems and issues regarding the effective use of Information Communication and Technology (ICT) in teacher training regarding distance education. The participants of the study included faculty and students who were randomly selected from a higher education institution within Pakistan. According to the study's findings, the top 10 barriers for tutors were a lack of training, a power outage, a lack of technical help, a lack of peer support, a slow internet connection, a lack of high-quality software, a lack of high-quality hardware, a lack of software, a lack of expertise, and a lack of confidence (Ghazi et al. 2013). Abdullah and Kauser (2022) used quantitative research to examine higher education students' perceptions of online learning during the pandemic. Due to a lack of technology, learning abilities, and internet connectivity, online learning negatively affected students' academic performance, according to the study's findings. In addition, the report concluded that higher education institutions should take drastic steps to guarantee a seamless online environment for students during the pandemic.

Jung et al. (2021) used qualitative research to analyze and investigate technology integration cases at a mid-sized public university to create a technology partnership model. The study's data revealed a systematic process for technology partnership between vendor-university partnerships, whereas five phases were established: "utilizing analysis, negotiation, pre-implementation, implementation, and evaluation" (Jung et al., 2021). The study also indicated that understanding technology providers and collaborative work relationships can lead to successful technology integrations. More importantly, this study showed that user participation and administration support are essential for creating sustainable and scalable technology partnerships.

Finally, some research indicated that outsourcing had become widespread in higher education. Wekullo (2017) reviewed 30 empirical articles to assess the effectiveness of outsourcing in higher education. The

results of this study show that the effects of outsourcing vary across institutions and range from positive to negative; more importantly, outsourcing may become expensive for institutions and students due to the profit factors intrinsic within private enterprises.

Table 2: Articles reviewed to identify Theme 2

Author(s)	Year	Contribution
Abdullah & Kauser	2022	This study found that online learning had a negative impact on higher education students' academic performance due to a lack of technology, learning abilities, and internet connectivity during the pandemic.
Butler & Sellbom	2002	This study revealed barriers to adoption of technology.
Ghazi, Hafeez, & Safdar	2013	Focused upon the problems and issues about the effective use of Information Communication and Technology (ICT) in teacher training regarding distance education.
Jung, Zheng, Webster, Hamad, Demir, & Kim	2021	Used a qualitative research approach to analyze and investigate technology integration cases at a mid-sized public university to create a technology partnership model.
Polly, Martin, & Guilbaud	2020	Determined the challenges related to faculty members' use of technology in their teaching by looking at the views of faculty members, administrators, and technology support staff.
Wekullo	2017	Reviewed 30 empirical articles to assess the effectiveness of outsourcing in higher education.

Theme 3: Impediments within technology integrations and implementations that are so difficult that they may not ever be within our power to solve

Theme three emerged from the review of eleven articles and is listed in Table 3. This theme focused on technology integration that included AI, CHATGPT, AI Writing, Bring Your Own Devices (BYOD), learning management systems (LMS), and online learning regarding cybersecurity, along with students' and faculty's perspectives due to the pandemic (Aboagye et al., 2020; Alkamel et al., 2021; Barakina et al., 2021; Clark et al., 2020; Fyfe, 2022; Ibrahim et al., 2020; Kampa, 2017; Păvăloaia & Necula, 2023; Rudolph et al., 2023; Selim et al., 2020; Yang et al., 2018). These areas are considered challenging because they necessitate the ability to sustain through adopting the latest IT trends.

Păvăloaia and Necula (2023) reviewed on AI as a disruptive technology. The review identified domains affected by AI; more importantly, findings that depict AI as a disruptive technology in education where positive and negative impacts were listed. For example, it was revealed that a positive impact would be to customize the learning experiences for students; however, this may eliminate social interactions. Another impact regarding teaching would be to improve teaching efficiency and effectiveness; however, this may decrease face-to-face interaction. More importantly, during the pandemic, face-to-face interaction had to alter to an online modality (Serhan, 2020). Further, Serhan included improving accessibility and reducing cost; however, dependence on technology leads to potential system failures and data unavailability.

Barakina et al. (2021) discussed the experience in implementing AI technologies in education globally. The findings focused on three main directions of the relationship between the development of AI technologies and education, which included training with AI technologies, research of AI and its technologies, and training qualified specialists to work with AI in higher education. Further findings from this study showed

that faculty and students had not mastered the effective use of technology with AI; therefore, it caused a level of trust for effective use (Barakina et al., 2021).

Fyfe (2022) discussed a pedagogical experiment that assigned undergraduates to "cheat" on a class essay through AI Writing. Students obtained content from an installation of GPT-2 and wrote a revealing version of the paper with their reflections. The assignment asked students to explore the potential ethics of using AI as a writing tool, what counts as plagiarism, and how working with AI could change their thinking about writing, authenticity, and creativity. Students shared their insights into broader conversations in the humanities about writing and communication and explained their reviews regarding the ethical use and evaluation of language models.

Rudolph et al. (2023) also described CHATGPT in a literature review investigating how it applies to higher education, including learning, teaching, and assessments. The study revealed that the educational implications of ChatGPT included concerns about the possibility of plagiarism in the classroom. Instructors and policymakers must regulate the situation; ineffective pedagogical practices may be revealed if no obstacles are identified (Rudolph et al., 2023).

Smart classrooms are essential for teaching content, classroom management, accessing learning resources, instructional interaction, and increasing contextual awareness Huang et al. (2012). Yang et al. (2018) investigated smart classrooms from both pedagogy and technology by conducting a survey within a school system in China. The survey was to provide information and reflections on the building and application of smart classrooms. The findings indicated that participants did not perceive much technology-enhanced smart learning in their classrooms, particularly in resources and enhancement. The findings also indicated that several students lacked access to digital learning resources and could not share them with their peers. Even in tablet classrooms, many students did not perceive technology-enhanced teaching and learning, indicating that the development and implementation of smart classrooms were still in their beginning stages and much work needed to be done.

Selim et al. (2020) also investigated the drivers of smart classroom adoption in higher education. The researchers felt that factors affecting smart classroom adoption had not been sufficiently explored; therefore, it was found that the innovation diffusion theory, which explains how, why, and at what rate new ideas and technology spread along with external pressures could provide an appropriate model for understanding what drives adoption (Selim et al., 2020). Further findings could be utilized for implications for higher education institutions, IT managers, and higher education research in smart classrooms.

In terms of cybersecurity, online learning has become a topic of discussion. Online learning, a method of acquiring knowledge and skills electronically, is impossible without the Internet (Ibrahim et al., 2020). Ibrahim et al. (2020) discussed cybersecurity concerns about the learning management system (LMS), the significance of e-Learning, and the database management system. However, the learning management system's cybersecurity was the primary concern. "A learning management system creates an online classroom that reinforces learning processes for instructors and students" (Bradley, 2021, p. 68). The study also identified numerous security challenges and threats in online learning and database management systems. Due to students and instructors attempting to gain access to their information or because other administrators are manipulating academic records within the LMS, security issues may arise. Consequently, Kampa (2017) examined how a library can be optimally incorporated into an eLearning platform, helping instructors and students access library resources. The study employs a quantitative research design to determine students' perceptions, whereas the respondents viewed the library integration in eLearning favorably. Further, it investigates the perceived utility of library integration in the eLearning platform in

which a Moodle LMS was utilized in this study. The findings revealed the simplicity with which students can access library resources and services through an integrated system (Kampa, 2017).

Even while online degrees existed before the pandemic, institutions faced difficulties in distance education preparation. As a result, some universities were hesitant to implement a distance education program (Asio & Bayucca, 2021). Other obstacles were internet connection, planning, money, and distance learning devices. Aboagye et al. (2020) investigated the difficulties students at postsecondary institutions have reported experiencing with online learning. It revealed that accessibility is the most significant obstacle students face in a comprehensive online learning environment, with social and lecture issues influencing their intentions to study online. In addition, the findings identified accessibility issues such as internet connectivity and the use of compatible smartphones and laptops (Aboagye et al., 2020).

Alkamel et al. (2021) examined the difficulties and advantages of online testing during the COVID-19 outbreak. The findings indicated that internet connectivity was problematic, and students reported that if they lost internet connectivity, they would be required to retake the test with new questions. Proctored environments should be more significant in online assessment, and institutions should encourage and inform students before exams to ensure their devices are connected to the internet and prepared. It is recommended that educational institutions allow students five more minutes to review their responses (Alkamel et al., 2021). Finally, Clark et al. (2020) examined the impact of different exam formats on exam security and continuity. The study found that using the same exam in an unsupervised online setting does not maintain the same academic integrity. Strategies for addressing these obstacles included using a test bank, following best practices, and maximizing access, security, and continuity while minimizing the technological and ethical pitfalls of online exams that were not proctored (Clark et al., 2020).

Table 3: Articles reviewed to identify Theme 3

Author(s)	Year	Contribution
Aboagye, Yawson, & Appiah	2020	Investigated the difficulties students at postsecondary institutions have reported experiencing with online learning.
Alkamel, Chouthaiwale, Yassin, AlAjmi, & Albaadany	2021	Examined the difficulties and advantages of online testing during the COVID-19 outbreak. Four themes were identified: psychology, ICT skills, advantages of traditional testing, and online testing challenges.
Barakina, Popova, Gorokhova, & Voskovskaya	2021	Examined the impact of a statewide technology program on 26 schools, focusing on student outcomes, skills, and teachers' attitudes toward technology integration.
Clark, Callam, Paul, Stoltzfus, & Turner	2020	Examined the impact of different exam formats on exam security and continuity.
Fyfe	2022	Reviewed 30 empirical articles to assess the effectiveness of outsourcing in higher education.
Ibrahim, Karabatak, & Abdullahi	2020	Discussed cybersecurity concerns about the learning management system (LMS), the significance of e-Learning, and the Database Management System. However, the learning management system's cybersecurity will be the primary concern.
Kampa	2017	Employed a quantitative research design to determine students' perceptions of library integration in eLearning.
Pāvāloaia & Necula	2023	Performed a literature review on AI as a disruptive technology. The review identified domains affected by AI; more importantly, findings that depict AI as a disruptive technology in education where positive and negative impacts were listed.

Author(s)	Year	Contribution
Rudolph, Tan & Tan	2023	Described CHATGPT in a literature review investigating how it applies to higher education. The study revealed that the educational implications of CHATGPT included the possibility of plagiarism in the classroom.
Selim, Eid, & Agag	2020	Investigated the drivers of smart classroom adoption in higher education. The researchers felt that factors affecting smart classroom adoption had not been sufficiently explored.
Yang, Pan, Zhou & Huang	2018	Investigated smart classrooms from both pedagogy and technology by conducting a survey within a school system in China.

Discussion

During the pandemic, schools were forced to reconsider technology integrations (Chaudhuri, 2022). Some researchers (Chen et al., 2019) define technology integration as using technology tools in general content areas to enable students to employ computer and technology skills to learn and solve problems. Some schools did not attain their full potential in implementing and integrating face-to-face and online technology, despite many schools successfully incorporating technology into their daily operations (Chaudhuri, 2022). The success of technology integration within education has many variables (Izmirli & Kirmaci, 2017). Therefore, IT leaders, decision-makers, and educators must reexamine barriers such as infrastructure improvement, professional development, budgeting, technology trends, and bureaucracy (Izmirli & Kirmaci, 2017). Stakeholders are responsible for identifying these obstacles and developing a model depicting successful implementation (Abrahams, 2010).

The narrative review focused on identifying themes from reviewing critical articles about technology integration barriers that affect IT Leaders, decision-makers, and educators within higher education. The results from the review depicted three emerging themes (1). Barriers within technology integrations and implementations are troublesome but solvable. (2). Obstacles within technology integrations and implementations that are more difficult and will require substantial effort to solve. (3). Impediments within technology integrations and implementations that are so difficult that they may not be within our power to solve. The three themes were used to address the research question, what themes can be identified from reviewing critical articles about technology integration barriers that affect IT Leaders, decision-makers, and educators within higher education? The articles reviewed in which theme 1 was identified were case studies that targeted professional development, buy-in, bureaucracy, and scarcity of curricula.

The articles reviewed in which theme 2 was identified were case studies that targeted vendors for IT-related purchases and the student and faculty perspective for technology integration within higher education. These barriers are considered more difficult to solve for IT leaders. The articles reviewed in which theme 3 was identified were case studies that targeted adopting technology trends and understanding the barriers, such as artificial intelligence regarding AI writing in education, and online learning in higher education. These barriers may not be in the power of the IT leaders to solve.

Conclusion, limitations, and recommendations for future research

Due to the impact of the pandemic, IT Leaders, decision-makers, and educators must consider the benefits of technology integration, whether within the traditional classroom, an online modality, or a blended environment. This narrative review identified three themes that address barriers these leaders and institutions must address. However, there are limitations to the review, whereas the majority of the articles reviewed were either before or during the pandemic. In addition, limited research reflected a post-pandemic regarding higher education. Other limitations were studies reviewed to identify the themes depicted by a small number of schools from the United States. Also, the case studies did not categorize the schools as

public colleges and universities, research universities, comprehensive universities, or state colleges. Therefore, recommendations for future research could depict colleges and universities from a specific state system.

After the barriers and usage of the technologies are identified, a method must be implemented based on the results (Duren et al., 2021). According to Aroa and Chander (2020, p.84), "there are currently several well-known technology integration models with TPACK, SAMR, and LoTi among the most recognized." Therefore, recommendations for future research will utilize articles that expound on these models to examine various themes. The research will include these models as they are known to depict technology integrations and implementation regarding IT Leadership (Duren et al., 2021).

The outcome of this narrative review demonstrates that thematic analysis as a tool allows IT leaders, decision-makers, and educators to gather large amounts of information regarding technology integration within higher education. The data collected identified themes that address barriers within technology integrations to assist stakeholders in implementing a successful technology integration process to target not only the technology and pedagogy. Once IT executives discover a way to overcome these obstacles, the integration will be more successful (Seyal, 2015).

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