TECHNOPHOBIA AS A TECHNOLOGY INHIBITOR FOR DIGITAL LEARNING IN EDUCATION: A SYSTEMATIC LITERATURE REVIEW

Amjad Ur Rehman, Al-Qadir University Project Trust Sohawa, Jhelum, Pakistan
Asif Mahmood, Arabian Gulf University, Manama, Bahrain
Shahid Bashir, Tecnologico de monterrey, Mexico
Mazhar Iqbal, Al-Qadir University Project Trust Sohawa Jhelum, Pakistan

ABSTRACT

This study aims to determine how technophobia, or dread of technology, hinders education and offers future research recommendations. Utilizing systematic reviews, researchers scoured numerous research sources for articles on technophobia in education. The admissions criteria were established, and 18 research works that met those criteria were selected for the study. The results suggest that fear of technology makes it more difficult for people to embrace and utilize it in education, and the Covid-19 pandemic has accelerated the trend toward online education, bringing new challenges and obstacles. The study suggests additional research into the causes of technophobia, its effects on students, the efficacy of teacher training programs, and the effect of teaching methods on students' dread of technology. Lastly, the study suggests that students, instructors, and education support personnel devise effective strategies to combat technophobia.

Keywords: *technophobia, education, systematic review, technology adoption*

INTRODUCTION

The development of new technologies has significantly influenced many facets of society, including the educational system, which has not been immune to these changes. Learning has largely supplanted the conventional classroom layout in today's schools because of the widespread acceptance of technology in education, which has created a major economic potential for the education sector (Rahman et al., 2018; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000). However, apprehension and animosity toward technology, which together make up the phenomenon known as "technophobia," have acted as a barrier to efficient learning and the mental health of pupils (Yunus et al., 2016).

Beginning in the 1980s—and continuing today—the fast expansion of technical innovations has brought with it an increase in the standards and performance of educational institutions, giving learning opportunities to both students and instructors (Rahman et al., 2018). The use of information and communication technology in education is a difficult and multilayered process that demands complete commitment from the administration and the instructors to provide the most up-to-date technology and creative teaching techniques, and a desire to accept them. However, pupils did not have as much self-assurance about the use of technology before the most recent epidemic. As a result of the Covid-19 pandemic, students' trust in the implementation of online education rose, which opened the door to chances for technical education (McClain et al., 2021). As a direct result of this, 87% of instructors are completely embracing digital instructional gadgets in the classroom to

lessen the level of technophobia caused by adopting new technology in underdeveloped nations (Manyeredzi & Mpofu, 2022). Despite this, many students and teachers are still hesitant to embrace these emerging technologies because of the potential for inappropriate content exposure.

According to studies, 70% of individuals experience anxiety as a result of the technical terminology used in computers; 52.1% of people love using computers; and twenty percent of people have unfavorable views regarding the presence of computers (Ahmad & Daud, 2011). At the same time, 87% of teachers in Nigeria do not use computer technology in the classroom due to a lack of technical ability, a lack of support from the government, and a fear of technology (Alege & Afolabi, 2011). Because of this, some internal and external elements, such as the standard of competency in utilizing technology, might give rise to anxiety in the process of adopting new technology (Pahamzah, 2020). Because technology is so often incorporated into educational settings and because its presence has been shown to have a major inhibitory effect on learning, technophobia is a serious obstacle in the field of education. Students who are uncomfortable with technology may have a difficult time studying in environments that are more widespread in schools, such as online learning platforms, virtual classrooms, and other digital tools. They may also have trouble completing projects that involve the use of technology, such as presentations or films. These kinds of tasks might be challenging for them. This might reduce the number of learning options available to them and slow down their academic advancement.

In addition, a fear of technology, an inability to read and write, an absence of relevant information, and a deficiency in computer skills have all become obstacles to expanding one's knowledge and abilities (Chaima & Kapondera, 2017). This may present itself in a multitude of ways, including but not limited to a lack of access to technology, socioeconomic disparity, racism, a lack of trained instructors, mental health, prejudice, overreliance on technology, distraction, and poor training. Because e-learning is a kind of education that is primarily dependent on technology, a fear of technology may have a big negative effect on the practice. Training in fundamental digital literacy skills, offering access to technological tools and assistance, and creating a culture of experimenting and learning in the classroom may be effective in the fight against technophobia. There are still adoption uncertainties for learners, even though modern firms are increasingly adopting IT systems to build commercial platforms to boost profitability and convenience (Zhao, 2022). In today's world, books are not the only way to get an education; electronic sources such as e-classrooms, smart courses, overhead projectors, computer CDs, laptops, and other devices are also widely used. Teachers, students, and parents of those students are all receiving various forms of training on how to make use of technology in order to facilitate the rapid acceptance and incorporation of technology into the educational system. Acquiring computer literacy and embracing technology to a significant degree requires an individual to have perseverance, trust, and self-confidence in themselves (Esterhuizen et al., 2012).

To summarize, technological advancements have transformed the educational system, yet the fear of new technologies has arisen as a key barrier. In order for students to have successful learning experiences and maintain healthy mental states, it is essential to combat technophobia. Consequently, the purpose of this research is to examine the ways in which a fear of technology (technophobia) might hinder education by contributing to elements such as stress, anxiety, and reluctance to utilize technology. In addition, we intend to provide future research recommendations on how to combat technophobia and improve the educational possibilities available to pupils.

The research on technophobia in education is valuable due to the increasing induction of technology in education and its special relevance in the context of the Covid-19 pandemic. The study has strength in terms of its rigorous systematic review; methodology; identification of research gaps and potential areas for future exploration; recognition of practical implications in the current time; incorporation of an interdisciplinary and global perspective; and an emphasis on improving the quality of life in the educational context. However, the overall impact is based on factors like the quality of the review process, research validity, rigorous data analysis process, and practicality of proposed strategies for the relevant community, which necessitate peer review and additional empirical studies

for validation and further expansion. We opted to utilize systematic reviews as a technique to fulfill the purpose of this study because we realized that furthering research and enhancing our grasp of the given subject is a difficult problem. This will assist researchers in making educated judgments and identifying areas where additional study is required, which will eventually lead to healthier outcomes and improved quality of life for both people and communities. In addition to that, this will provide a detailed and objective overview of the data that have so far been accumulated about technophobia in the education sector.

CONTEXTUAL ANALYSIS FOR SYSTEMATIC REVIEW

The term "technophobia" refers to the dread of technology. People who suffer from this syndrome may have difficulty using digital equipment such as computers, cell phones, and other digital tools, or they may choose to forego the use of technology completely. This syndrome may have an effect on a person's quality of life as well as their capacity to operate in a society that is becoming more and more dependent on technology. Since 1980, there have been several discussions on technophobia in scientific literature, with the majority of research concentrating on the incorporation of new technology (Czaja et al., 2006; Powell, 2013; Soja & Soja, 2015). Research has been conducted in a variety of fields, including health, the entertainment industry, and the financial services sector, amongst others, to investigate the effect that introducing new technologies plays in the adoption process (Campbell, 2004; Cimperman et al., 2013; Dogruel et al., 2015; Jung et al., 2010; Moore et al., 2015; Phang et al., 2006; Ryu et al., 2009; Shedletsky, 2006; Wild et al., 2012). However, only a small number of scholars have particularly focused their attention on technophobia in the educational setting (Alanezi & AlAzwani, 2020; Dhawan, 2020; Liguori & Winkler, 2020; Rajab et al., 2020). The majority of research uses measures of technophobia to evaluate computer and internet training programs, and the majority of these studies demonstrate an improvement in postoperative computer stress reduction (Campbell, 2004; Chu et al., 2009; Ellis & Allaire, 1999; Jung et al., 2010; Shedletsky, 2006; Wild et al., 2012). Others investigate their interest in mastering computer and internet abilities and discover that it is inversely connected to their level of fear of technology (Cimperman et al., 2013; Moore et al., 2015).

The use of technology comes with a variety of advantages, including adaptability, accessibility on all levels, a high degree of convenience, the possibility to utilize many platforms for various communities, reduced delivery costs for organizing, an easier capacity to stay current with emerging trends, ease of collaboration and mutual learning, and vast scalability. Fear of technology is one of the primary impediments standing in the way of widespread acceptance of new technologies. There are a number of other hurdles as well. In terms of connection, abilities, and the advantages that are matched with them, there are three stages of technophobia (Nimrod, 2018).

The incorporation of a variety of e-services and technologies into online education paves the way for the development of accessible, useful, inclusive, and intelligent models for both instructors and students, with the goal of lowering levels of technophobia. The integration of technology in the classroom may be embedded in the instructors' enthusiasm and the technical environment of the classroom (Romero, Riquelme, & Halal, 2019). Teachers who are afraid of technology may have trouble integrating it into their lesson plans and may find it difficult to give support to students who need assistance with technology. Because of this, students' access to learning opportunities may be restricted, which may slow down their overall academic advancement. Students have the impression that they are not equipped to adapt to academic tasks that include the use of information and communication technology, but professors are more concerned with the advantages of technology, the most recent advances, and innovations related to the use of technology in education (Beckers & Schmidt, 2001; Sattar, 2017). Training programs may improve a person's sense of their ability to operate a computer and minimize the fear of using a computer. Even when educational institutions have access to computers and other information technology resources, instructors may not be able to make use of them, owing to their fear of technology and anxiety about using computers (Hervas-Gomez et al., 2016; Lam, 2000; Rosen & Weil, 1995).

The pandemic caused by Covid-19 has brought about a significant transformation in the field of

education. Numerous research studies have been conducted to study the difficulties associated with online education in higher education (Alanezi & AlAzwani, 2020; Rajab et al., 2020). The findings of a meta-analysis on the use of education technology from 2015–2020 have adequate outcomes in terms of teaching and learning (Yildiz et al., 2020). Currently, researchers have investigated the prospects, difficulties, strengths, and limits of educational technology in an effort to open up new avenues for future research and development (Dhawan, 2020; Liguori & Winkler, 2020). The didactic approach is used in the classroom, even though professors and instructors have little technological competence and know-how (Cuhadar, 2018; Tejedor-Tejedor et al., 2009). This approach makes use of visual presentations and electrical components (Area-Moreira et al., 2016). In economically developed countries, elementary and secondary schools are increasingly incorporating digital technology into their curricula (Drent & Meelissen 2008; Esterhuizen et al., 2013; González-Sanmamed et al., 2017). The function of the instructor is what ultimately determines how much technology is used in the classroom.

Precisely, having a fear of technology may have a negative effect on a person's quality of life as well as their capacity to operate in a society that is becoming increasingly dependent on technology. There are many advantages to using technology but many obstacles to its widespread acceptance, including fear of technology. The use of e-services and other technological advancements in online education may help both students and instructors overcome their fear of technology. Teachers who are afraid of technology may have trouble integrating it into their lesson plans and may find it challenging to give support to students who need assistance with technology. Researchers have investigated the potential for online learning; the strengths and limits of educational technologies; and the role of the teacher in the integration of technology into education in light of the Covid-19 pandemic, which has brought both challenges and opportunities to the education sector.

As a consequence of this, the systematic review will provide a complete summary of the available research on technophobia and the influence it has on the integration of technology into educational settings.

SYSTEMATIC REVIEW CONDUCT

Methodology

Since the purpose of this research is to examine the ways in which technophobia might hinder education, to provide recommendations about how to combat technophobia, and to improve the educational possibilities available to pupils, this review decided the most significant population would be students, teachers, and educational support staff. Several researchers are also found to support our arguments, such as Akinyemi (1986), Rosen and Weil (1995), Weil and Rosen (1995), Anthony et al. (2000), Lam (2000), Salmon and Jones (2004), (Mahmood, & Montagna, 2013), Oyelude and Oladele (2014), Wang and Chen (2015), Bolandifar and Noordin (2015), Yunus et al. (2016), Pahamzah (2020), Daruwala (2020), Mercader (2020), Rajab et al. (2020), Bardakci and Ünver (2020), Shao, Mahmood, & Han (2021) Khasawneh (2022), and Ajani and Buraimo (2022).

Therefore, for systematic review purposes, we used predefined search terms from several quality research databases, such as Scopus, Web of Science, ProQuest, ERIC, JSTOR, Wiley Online Library, and Google Scholar, to discover published works on technophobia in education. The title, keywords, and abstract were used in the search. The following terms were used to discover related publications in databases based on the purpose of this systematic review, which was to examine the present data in the literature on technophobia in education: "Technophobia and Education," "Technophobia and Students," and "Technophobia and Teachers."

Selection Criteria

To gather more insightful outcomes, the following inclusion and exclusion criteria were employed to identify the articles. The search was narrowed down using the following inclusion criteria: (1) an article in a journal; (2) articles must be published in English; (3) full-text articles must be available; (4) the technophobia within the field of education/learning should be investigated; and (5) the focus of study should be about technophobia in students, teachers, and others in the field of education. There was no time limit imposed. After studying highly referenced papers and the works of notable authors on the topic of technophobia, the inclusion and exclusion criteria were chosen

during a brainstorming session among the authors of this article.

As a result of applying the search terms, 344 research publications were retrieved. In the first step, we applied filters like document type ("Articles") and Language ("English"), and when duplications were removed, 152 articles remained. The articles were then eliminated based on their titles and abstracts. Following that, we evaluated the entire text of the remaining papers and removed irrelevant research. In the end, 18 papers remained for analysis. The screening and selection methods were carried out by two of the study's authors, and disagreements between these two authors on the inclusion or exclusion of the few studies were discussed among all authors.

The 18 studies left for analysis were published between the years 1986–2022. Six studies were carried out during the period from 2004–2016, and seven studies were carried out between 2020–2022, which included the Covid-19 pandemic. This is consistent with the claims made by Rajab et al. (2020), Daruwala (2020), and Khasawneh (2022), which state that research on the ramifications, consequences, barriers, and issues associated with the adoption of technology has expanded at an exponential rate both during and after the Covid-19 period. Twelve articles were published on emerging economies such as Indonesia, Saudi Arabia, Spain, Taiwan, Turkey, Nigeria, South Africa, and Malaysia, while six were published on established economies such as the United States of America, Canada, and the United Kingdom. Seven of these 18 articles solicited responses from educators, six of these 18 papers solicited responses from students, and five of these 18 papers solicited responses from education professionals. The summary of the chosen studies is shown in Table 1.

Findings and Analysis

Technophobia was initially proposed in 1986 to study technophobia among Nigerian primary school teachers (Akinyemi, 1986). Later, several technophobia characteristics were studied. Weil and Rosen (2015) examined the psychological impact of technophobia in schooling on technology and computer users. Technology in the classroom has been classified as technophobia and technophilia (Lam, 2000). Six studies were conducted by academics on technology in education from 2004–2016. During and after the Covid-19 pandemic, research

Table 1.
Summary of Chosen Studies

Distribution of Publications	Range of Category	Number of Publications
Yearly	1986–2003	5
	2004–2016	6
	2017–2022	7
Geographical	United States	3
	Canada	1
	United Kingdom	2
	Indonesia	1
	Saudi Arabia	1
	Spain	1
	Nigeria	3
	Taiwan	1
	Turkey	1
	Malaysia	2
	South Africa	2
Respondents	Teachers	7
	Students	6
	Educational Professionals	5

on the implications, repercussions, impediments, and problems of technology adoption has increased exponentially (Daruwala, 2020; Khasawneh, 2022; Rajab et al., 2020). This accelerated the trend in online education. The pandemic increased education technology utilization. Research advances allow for a variety of technophobia treatments. Research benefits students, instructors, and educational support professionals, like librarians.

Over time, different parts of the world have done studies on technophobia in the area of education, including the USA (Khasawneh, 2022). In this context, researchers looked at the psychological effects of technology on education, how technology and computers are used in schools, and how people accept technology for education. The United States has a very good system for technology, so there are not as many people who are afraid of it as there are in other countries. In the UK, different problems like lack of training, too much knowledge, lack of experience, and stress caused by technology were found to stop university staff and students from using technology (Daruwala, 2020; Salmon & Jones, 2004). In Canada, teachers are less afraid of technology because their schools give them and their students the necessary tools (Lam, 2000).

Emerging economies like Indonesia, Saudi Arabia, Spain, Taiwan, Turkey, and Malaysia were studied to find ways to deal with the problem (Bardakci & Ünver, 2020; Bolandifar & Noordin, 2015; Mercader, 2020; Pahamzah, 2020; Rajab et al., 2020; Wang & Chen, 2015; Yunus et al., 2016). In all areas of life, technology has made it possible and necessary for people to communicate with each other. Technology was used to teach students about online classes and tests. Due to low resources and problems with adopting technology in Nigeria and South Africa, three research works (Ajani & Burajmo, 2022; Akinyemi, 1986; Anthony et al., 2000) looked at computer anxiety, automation in education structure, and implementation problems for leadership.

Anthony et al. (2000) found that students in emerging and developing countries have more computer anxiety, technostress, and problems with getting used to computers. Teachers do not know much about new technology, so they do not want to use it in the classroom (Akinyemi, 1986). When there are not enough people with schooling and technology, planning and keeping track of time is hard. Teachers are less afraid of using technology in the classroom but want the government and other groups to set up the necessary infrastructure (Ajani & Burajmo, 2022). New techniques and improvements in libraries and web-based systems are a task for the staff that helps run the technology. Parents are also afraid of technology, even though they know that schools must use it.

It is also important to use technology in ways that all students can understand, no matter how comfortable they are with it. This can include using different kinds of technology, like interactive whiteboards, tablets, and computers, so students can choose the best tools (Bardakci & Ünver, 2020). With this, giving students chances to learn about technology hands-on can help them become more comfortable with digital tools and less afraid of them. When creating technology and services, it is also important to consider the needs of all people, including those who may be frightened by technology. Compared to younger people, older people are more afraid of technology, which is true for older men and women (Hogan, 2009). So, most parents use it as a way to stay away from gadgets. Technophobia can make it hard to advance in your career, preventing workers from getting new jobs. Many jobs now require the use of technology, and workers who are not good with it may have trouble doing their jobs or miss out on raises.

Our study on technophobia shows that it has made it harder to learn over time. In this part, 18 research papers were looked at in a structured way to make a full conceptual review that shows a deep study of the material. According to the results of 18 empirical and qualitative studies, interviewees came from schools and colleges, as well as the class of teachers, students, supporting professionals, and others. The study has gender, regional, economic, and social factors like age, class, economic well-being, and building changes. From the last 30 years to the current Covid-19 pandemic, there have been a lot of scientific advances. In the end, a study on technophobia has looked into the many things that make people afraid of technology. There are many problems with the way technology is used in schools.

META-ANALYSIS

The concept of technophobia in education, which refers to the fear or anxiety associated with technology, is discussed. Technophobia has

the potential to hinder education, making it more challenging for students and educators to adapt to and utilize technology for learning and teaching. The study highlights the evolution of research on technophobia in education with a focus on psychological impacts, barriers to technology acceptance, and the role of leadership. The study found that the Covid-19 pandemic significantly accelerated the adoption of technology in education due to the shift towards online learning, leading to a surge in research on technology adoption and technophobia. In regards to technophobia, differences have been observed between emerging economies and developed countries due to the geographical variations based on access to resources and infrastructure facilities. Almost all educational stakeholders, such as teachers, students, educational professionals, and parents, are affected by technophobia to varying degrees, which can be overcome with effective strategies and interventions. Various technological barriers, which include inadequate training, lack of experience, and worries about privacy and security, are hurdles to overcome. By recommending potential solutions such as involving training programs, hands-on learning, and creating user-friendly technology, this study highlights multiple areas for future research, including understanding the causes and impacts of technophobia on learning outcomes, effective teaching methods, and strategies to resolve.

DISCUSSION

This study adds to what we know by showing how technophobia can stop technology from being used in education. From 1986 to 2000, research was conducted on how technology was slowly introduced into education, including the psychological effects and barriers to acceptance. In 2000, researchers looked at how teachers, students, and support staff could use technology and what problems they might face. In the past few decades, the study of technophobia in education has come a long way. In the first part, the role of leadership in low-developed, underdeveloped, and advanced economies was examined so that training and development programs could be implemented to help people overcome their fears of technology, computers, and the "digital menace." During and after the Covid-19 pandemic, it was found that schooling and the use of new technology are primary contributors to technophobia.

On the other hand, few studies have been conducted on how technophobia affects learning. The Covid-19 pandemic has changed every part of our lives, including education and business as we know it, by giving us more ways to learn through technology (Rajab et al., 2020). Governments told people to stay home, and schools and universities worldwide closed as a result. Because of this, online classes have become an important part of keeping up with education. To keep up with the fast growth of technology, many countries have made rules about how to teach and learn with the help of technology (Zafrani et al., 2022). For the well-being and independence of people using social assistive robotic technologies, it is important to do more research on how to help people and to lessen their fear of technology when it comes to how easy they are to use. For people to use information and communication tools, they need to have the right mindset and set of ideas. In this case, user-friendliness, user trust, ease of learning, and predicted rewards are important factors that affect acceptance behavior (Kyakulumbye & Pather, 2022).

But in many third-world countries, technology in schooling has been slow to catch on. To keep up with the fast growth of technology, many countries have made rules about teaching and learning with the help of technology. However, many third-world countries have been slow to use technology in their schools. It shows and talks about how important the right kinds of leadership styles and actions are for adapting to new technology. Kwon et al. (2019) found that teachers' self-efficacy and trust in their ability to use mobile technology are linked to their willingness to bring it into the classroom for the students' benefit and confidence to use it. Most of the time, a person's socioeconomic background is a benefit when it comes to using computers and a drawback when it comes to computer worry (Bozionelos, 2004). Moreover, only a small number of studies have been conducted on how technology affects schooling. Because of this, scholars should put more effort into getting rid of the worst effects of technophobia in education. Some of the problems caused by the pandemic were communication, grading students, using technology, being online, worrying or being stressed about the pandemic, managing time, and being afraid of technology.

The 18 studies on technophobia in education taught us that fear of technology makes learning hard—this is one of the most important inputs. The research study was based only on what was already known about the subject. Human factors, innate values, the learning process, and external factors are some of the main types of barriers to technology adoption (Schulz et al., 2015). Other barriers include a lack of technical help, a negative attitude toward technology, and difficulty adopting new technology. During the Covid-19 era, a lot of research on technophobia was found. There has been a big change in how things are going. Other important study areas were also found based on past research and what people wanted. Because of this, more research needs to be done on how to get rid of technophobia in education so that technology can be used more. Even though there has been a lot of study on technophobia, no one has discovered its role in education. The current study also substantiates that students value the professional skills they need and learn in school because they can see how these skills can help them get jobs and internships. Because of this, users may be difficult to measure and separate from other factors, because they may be a part of them. Based on what we have discussed so far, it seems that technophobia has always been a way to avoid accepting technology. However, with the right resources and support, students can overcome this problem by accepting technology, with online class preferences and students' learning styles acting as moderators (Khasawneh, 2022). People can overcome their fear of technology and other barriers to adopting it if an educational school holds classes on professional ethics and how to use new technologies (Oyelude & Oladele, 2014).

CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH INSIGHTS

In conclusion, the research on technophobia in education has shown how fear of technology might impede the acceptance and use of technology in educational environments. Research has been conducted throughout the years on the psychological impacts of technology on education, how technology is employed in schools, and how people feel about the use of technology for educational purposes. The widespread reach of the Covid-19 pandemic has hastened the trend toward online education (e.g., Zoom, Microsoft Teams, Skype, Google Hangouts, and other educational technologies are growing globally), which has led to a surge in studies on the ramifications, consequences, barriers, and challenges associated with the use of technology. Studies on the topic of technophobia in education have been conducted in several regions of the globe, and a range of potential remedies, including providing students with opportunities for experiential learning and taking into account the requirements of all individuals, have been recommended. It is possible that future studies may center on the investigation of novel approaches to the treatment of technophobia, such as the creation of efficient interventions for students, teachers, and educational support professionals. Therefore, based on the entire discussion, future research on technophobia in the education business could look into the following:

1. To deal with technophobia in the education field successfully, it is important to know why people have this fear or dislike of technology. Research could look at things like bad experiences with technology in the past, not knowing how to use it, and worries about privacy and security.
2. Technophobia can have a big effect on how well students do in education, from making it harder for them to do their homework to narrowing their future job options. Future studies could look at the specific ways that fear of technology affects how students do in school and how teachers can help.
3. Teachers are very important in helping students figure out how to use technology, but they may also be afraid of it. Researchers might investigate how successfully teacher education programs assist those fearful of technology and make it simpler to utilize technology in the classroom.
4. Some teaching methods may make students more fearful of technology, while others may make them feel more comfortable with it. In the future, researchers could look at how different ways of teaching, such as project-based learning or open classes, affect students' fear of technology.
5. There is not a single way to deal with technophobia in the education business. The

goal of research could be to find effective ways to deal with technophobia, like adding more hands-on tasks or giving students who have trouble with technology more help.

By focusing on these areas of study, we can better understand and deal with the problems caused by technophobia in the education field. This will help ensure that all students have a chance to do well in a world driven by technology. Nonetheless, certain limitations of this research should be considered. In the first place, this review is focused on how technology is used in education and how it can lead to mental distractions. Health and farming studies could be important to plan in the education field. So, to eliminate technophobia, the effects should be looked at from a wide angle using quantitative analyses to determine how students, teachers, and parents feel about using technology (Buchanan et al., 2013). Besides Scopus, Web of Science, ProQuest, ERIC, JSTOR, Wiley Online Library, Google Scholar, more sources should be used to look into the study.

References

Ahmad, J. I., & Daud, M. S. (2011). Technophobia phenomenon in a higher educational institution: A case study. 2011 IEEE Colloquium on Humanities, Science and Engineering, pp. 111–116. IEEE. https://doi.org/10.1109/CHUSER.2011.6163697

Ajani, F. O., & Buraimo, O. (2022). Perceived impact of automation on university library services by library personnel in South West, Nigeria. Information Development, 38(2), 179–191. https://doi.org/10.1177/0266666921992089

Akinyemi, K. (1986). A study of technophobia among primary school teachers in Nigeria. PLET: Programmed Learning & Educational Technology, 23(3), 263–269. https://doi.org/10.1080/0033039860230312

Alanezi, Y. H., & AlAzwani, N. S. (2020). Future of mobile learning during and after global (Covid-19) pandemic: College of basic education as case. Future, 11(17). https://doi.org/10.7176/JEP/11-17-01

Alege, B., & Afolabi, S. (2011). Survey of teachers' use of computer/internet in secondary schools in Southwest Nigeria. Proceedings of the European Conference on e-Learning 2011.

Anthony, L. M., Clarke, M. C., & Anderson, S. J. (2000). Technophobia and personality subtypes in a sample of South African university students. Computers in Human Behavior, 16(1), 31–44. https://doi.org/10.1016/S0747-5632(99)00050-3

Area-Moreira, M., Hernández-Rivero, V., & Sosa-Alonso, J. J. (2016). Models of educational integration of ICTs in the classroom. Comunicar: Media Education Research Journal, 24(1). https://doi.org/10.3916/C47-2016-08

Arigbabu, A. A. (2009). Examining psychometric characteristics of the computer anxiety scale.

Computers in Human Behavior, 25, 229–232

Bardakci, S., & Ünver, T. K. (2020). Teachers and interactive white boards: A qualitative investigation in the margin of technophobia. Australian Educational Computing, 35(1).

Beckers, J. J., & Schmidt, H. G. (2001). The structure of computer anxiety: A six-factor model. Computers in Human Behavior, 17(1), 35–49. https://doi.org/10.1016/S0747-5632(00)00036-4

Bolandifar, S., & Noordin, N. (2015). Computer anxiety and attitudes toward using internet in English language classes among Iranian postgraduate student teachers. Pertanika Journal of Social Sciences & Humanities, 23(2).

Bozionelos, N. (2004). Socio-economic background and computer use: The role of computer anxiety and computer experience in their relationship. International Journal of Human-Computer Studies, 61(5), 725–746. https://doi.org/10.1016/j.ijhcs.2004.07.001

Brosnan, M. J., & Thorpe, S. J. (2006). An evaluation of two clinically derived treatments for technophobia. Computers in Human Behavior, 22(6), 1080–1095. https://doi.org/10.1016/j.chb.2006.02.001

Buchanan, T., Sainter, P., & Saunders, G. (2013). Factors affecting faculty use of learning technologies: Implications for models of technology adoption. Journal of Computing in Higher Education, 25(1), 1–11. https://doi.org/10.1007/s12528-013-9066-6

Campbell, R. J. (2004). Older women and the internet. Journal of Women & Aging, 16(1-2), 161–174. https://doi.org/10.1300/J074v16n01_11

Chaima, M., & Kapondera, S. K. (2017, May). The usage of Khudze multipurpose community telecentre in Mwanza District, Malawi. 2017 IST-Africa Week Conference (IST-Africa), pp. 1–10). IEEE. https://doi.org/10.23919/ISTAFRICA.2017.8102399

Chu, A., Huber, J., Mastel-Smith, B., & Cesario, S. (2009). "Partnering with seniors for better health": Computer use and internet health information retrieval among older adults in a low socio-economic community. Journal of the Medical Library Association: JMLA, 97(1), 12. https://doi.org/10.3163/1536-5050.97.1.003

Cimperman, M., Brenčič, M. M., Trkman, P., & Stanonik, M. D. L. (2013). Older adults' perceptions of home telehealth services. Telemedicine and e-Health, 19(10), 786–790. https://doi.org/10.1089/tmj.2012.0272

Cuhadar, C. (2018). Investigation of pre-service teachers' levels of readiness to technology integration in education. Contemporary Educational Technology, 9(1), 61–75. https://doi.org/10.30935/cedtech/6211

Czaja, S. J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S. N., Rogers, W. A., & Sharit, J. (2006). Factors predicting the use of technology: Findings from the Center for Research and Education on Aging and Technology Enhancement (CREATE). Psychology and aging, 21(2), 333. https://doi.org/10.4017/gt.2005.03.04.090.00

Daruwala, N. A. (2020). Generation lockdown: Exploring possible predictors of technology phobia during the Coronavirus self-isolation period. Aloma: Revista de Psicologia, Ciències de l'Educació de l'Esport, 38(1), 15–19. https://doi.org/10.51698/aloma.2020.38.1.15-19

Dhawan, S. (2020). Online learning: A panacea in the time of Covid-19 crisis. Journal of Educational Technology Systems, 49(1), 5–22. https://doi.org/10.1177/0047239520934018

Dogruel, L., Joeckel, S., & Bowman, N. D. (2015). The use and acceptance of new media entertainment technology by elderly users: Development of an expanded technology acceptance model. Behaviour & Information Technology, 34(11), 1052–

1063. https://doi.org/10.1080/0144929X.2015.1077890

Drent, M., & Meelissen, M. (2008). Which factors obstruct or stimulate teacher educators to use ICT innovatively? Computers & Education, 51(1), 187–199. https://doi.org/10.1016/j.compedu.2007.05.001

Ellis, R. D., & Allaire, J. C. (1999). Modeling computer interest in older adults: The role of age, education, computer knowledge, and computer anxiety. Human Factors, 41(3), 345–355. https://doi.org/10.1518/001872099779610996

Esterhuizen, H. D., Blignaut, S., & Ellis, S. M. (2012). ODL students' perceived computer literacy competencies, expectations of support intention to use and perseverance. Turkish Online Journal of Distance Education, 13(4).

Esterhuizen, H. D., Blignaut, S., & Ellis, S. (2013). Looking out and looking in: Exploring a case of faculty perceptions during e-learning staff development. International Review of Research in Open and Distributed Learning, 14(3), 59–80. https://doi.org/10.19173/irrodl.v14i3.1358

González-Sanmamed, M., Sangrà, A., & Muñoz-Carril, P. -C. (2017). We can, we know how. But do we want to? Teaching attitudes towards ICT based on the level of technology integration in schools. Technology, Pedagogy, and Education, 26(5), 633–647. https://doi.org/10.1080/1475939X.2017.1313775

Hervas-Gomez, C., Lopez Mata, E., Real Plehan, S., & Fernandez Marquez, E. (2016). Technophobia: Skills, attitudes, and training of students of the degree in primary education. Ijeri-International Journal of Educational Research and Innovation, (6), 83–94.

Hogan, M. (2009). Age differences in technophobia: An Irish study. Information Systems Development, pp. 117–130. Springer: Boston, Massachusetts. https://doi.org/10.1007/978-0-387-68772-8_10

Jung, Y., Peng, W., Moran, M., Jin, S. -A. A., McLaughlin, M., Cody, M., Jordan-Marsh, M., Albright, J., & Silverstein, M. (2010). Low-income minority seniors' enrollment in a cybercafé: Psychological barriers to crossing the digital divide. Educational Gerontology, 36(3), 193–212. http://dx.doi.org/10.1080/03601270903183313

Khasawneh, O. Y. (2022). Technophobia: How students' technophobia impacts their technology acceptance in an online class. International Journal of Human–Computer Interaction, 1–10. https://doi.org/10.1080/10447318.2022.2085398

Kwon, K., Ottenbreit-Leftwich, A. T., Sari, A. R., Khlaif, Z., Zhu, M., Nadir, H., & Gok, F. (2019). Teachers' self-efficacy matters: Exploring the integration of mobile computing device in middle schools. TechTrends, 63(6), 682–692. https://doi.org/10.1007/s11528-019-00402-5

Kyakulumbye, S., & Pather, S. (2022). Understanding ICT adoption amongst SMEs in Uganda: Towards a participatory design model to enhance technology diffusion. African Journal of Science, Technology, Innovation, and Development, 14(1), 49–60. https://doi.org/10.1080/20421338.2020.1802843

Lam, Y. (2000). Technophilia vs. technophobia: A preliminary look at why second-language teachers do or do not use technology in their classrooms. Canadian Modern Language Review, 56(3), 389–420. https://doi.org/10.3138/cmlr.56.3.389

Liguori, E., & Winkler, C. (2020). From offline to online: Challenges and opportunities for entrepreneurship education following the Covid-19 pandemic. Entrepreneurship Education and Pedagogy, 3(4), 346–351. https://doi.org/10.1177/2515127420916738

Mahmood, A. and Montagna, F (2013). Making Lean Smart by Using System-of-Systems' Approach, IEEE Systems Journal, 7(4), 537-548, doi: 10.1109/JSYST.2013.2244801

Manyeredzi, T., & Mpofu, V. (2022). Smartphones as digital instructional interface devices: The teacher's perspective. Research in Learning Technology, 30. https://doi.org/10.25304/rlt.v30.2639

McClain, C., Vogels, E. A., Perrin, A., Sechopoulos, S., & Rainie, L. (2021). The internet and the pandemic. Pew Research Center. Retrieved from https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic

Mercader, C. (2020). Explanatory model of barriers to integration of digital technologies in higher education institutions. Education and Information Technologies, 25(6), 5133–5147. https://doi.org/10.1007/s10639-020-10222-3

Moore, A. N., Rothpletz, A. M., & Preminger, J. E. (2015). The effect of chronological age on the acceptance of internet-based hearing health care. American Journal of Audiology, 24(3), 280–283. https://doi.org/10.1044/2015_AJA-14-0082

Nimrod, G. (2018). Technophobia among older internet users. Educational Gerontology, 44(2-3), 148–162. https://doi.org/10.1080/03601277.2018.1428145

Oyelude, A. A., & Oladele, B. A. (2014). The leadership dimension in information and communication technology adoption in African libraries. Sage Open, 4(1), 2158244014522071. https://doi.org/10.1177/2158244014522071

Pahamzah, J. (2020). Technophobia in CALL teacher education: What language teachers can do to be professionals. Asian EFL Journal Research Articles, 27(5), 206–213.

Phang, C. W., Sutanto, J., Kankanhalli, A., Li, Y., Tan, B. C., & Teo, H. -H. (2006). Senior citizens' acceptance of information systems: A study in the context of e-government services. IEEE Transactions on Engineering Management, 53(4), 555–569. https://doi.org/10.1109/TEM.2006.883710

Powell, A. L. (2013). Computer anxiety: Comparison of research from the 1990s and 2000s. Computers in Human Behavior, 29(6), 2337–2381. https://doi.org/10.1016/j.chb.2013.05.012

Rahman, M. M., Suhaimi, A., & Shah, A. (2018, November). A model of factors influencing cloud computing adoption among faculty members and students of higher educational institutions of Bangladesh. 2018 IEEE 5th International Conference on Engineering Technologies and Applied Sciences (ICETAS), pp. 1–5. IEEE. https://doi.org/10.1109/ICETAS.2018.8629132

Rajab, M. H., Gazal, A. M., & Alkattan, K. (2020). Challenges to online medical education during the Covid-19 pandemic. Cureus, 12(7), e8966.

Romero, R., Riquelme, I., & Halal, C. (2019). Barriers in teacher perception about the use of technology for evaluation in higher education. Digital Education Review, 35, 170–185.

Rosen, L. D., & Weil, M. M. (1995). Computer availability, computer experience, and technophobia among public school teachers. Computers in Human Behavior, 11(1), 9–31. https://doi.org/10.1016/0747-5632(94)00018-D

Ryu, M. H., Seongcheol, K., & Lee, E. (2009). Understanding the factors affecting online elderly user's participation in video UCC services. Computers in Human Behavior, 25(3), 619–632. https://doi.org/10.1016/j.chb.2008.08.013

Salmon, D., & Mathew, J. (2004). Higher education staff experiences of using web-based learning technologies. Journal of Educational Technology & Society, 7(1), 107–114.

Schulz, R., Isabwe, G. M. N., & Reichert, F. (2015, September). Investigating teachers' motivation to use ICT tools in higher education. 2015 Internet Technologies and Applications (ITA), pp. 62–67. IEEE. https://doi.org/10.1109/ITechA.2015.7317371

Shao J, Mahmood A, Han H (2021). Unleashing the Potential Role of CSR and Altruistic Values to Foster Pro-Environmental Behavior by Hotel Employees. International Journal of Environmental Research and Public Health. 18(24):13327. https://doi.org/10.3390/ijerph182413327

Shedletsky, L. J. (2006). Internet training for older adult learners: An intergenerational mentoring approach. LLI Review, 1.

Soja, E., & Soja, P. (2015). Overcoming difficulties in ICT use by the elderly. Challenges and development trends of modern economy, finance and information technology, 413–422.

Tejedor-Tejedor, F. J., García-Valcárcel-Muñoz-Repiso, A., & Prada-San-Segundo, S. (2009). A scale for the measurement of university teachers' attitudes towards the integration of ICT. Communicate: Scientific Journal of Communication and Education, 17(33), 115–124. https://doi.org/10.3916/c33-2009-03-002

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision Sciences, 39(2), 273–315. https://doi.org/10.1111/j.1540-5915.2008.00192.x

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science, 46(2), 186–204. https://doi.org/10.1287/MNSC.46.2.186.11926

Wang, C. -C., & Chen, J. -J. (2015). Overcoming technophobia in poorly-educated elderly: The HELPS-seniors service learning program. International Journal of Automation and Smart Technology, 5(3), 173–182. https://doi.org/10.5875/ausmt.v5i3.980

Weil, M. M., & Rosen, L. D. (1995). The psychological impact of technology from a global perspective: A study of technological sophistication and technophobia in university students from twenty-three countries. Computers in Human Behavior, 11(1), 95–133. https://doi.org/10.1016/0747-5632(94)00026-E

Wild, K. V., Mattek, N. C., Maxwell, S. A., Dodge, H. H., Jimison, H. B., & Kaye, J. A. (2012). Computer-related self-efficacy and anxiety in older adults with and without mild cognitive impairment. Alzheimer's & Dementia, 8(6), 544–552. https://doi.org/10.1016/j.jalz.2011.12.008

Yildiz, E. P., Çengel, M., & Alkan, A. (2020). Current trends in education technologies research worldwide: Meta-analysis of studies between 2015–2020. World Journal on Educational Technology: Current Issues, 12(3), 192–206. https://doi.org/10.18844/wjet.v12i3.5000

Yunus, K., Wahid, W., Omar, S. S., & Ab Rashid, R. (2016). Computer phobia among adult university students. International Journal of Applied Linguistics and English Literature, 5(6), 209–213. https://doi.org/10.7575/aiac.ijalel.v.5n.6p.209

Zafrani, O., Nimrod, G., & Edan, Y. (2022). Between fear and trust: Older adults' evaluation of socially assistive robots. International Journal of Human-Computer Studies, 102981. https://doi.org/10.48550/arXiv.2207.05387

Zhao, B. (2022). The role of classroom contexts on learners' grit and foreign language anxiety: Online vs. traditional learning environment. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.869186

APPENDIX 1. SUMMARY OF SELECTED RESEARCH PAPERS

Author(s) and Year	Research Purpose	Research Methodology	Findings	Citations
Akinyemi (1986)	To study technophobia among primary teachers in Nigeria.	Study collected data from 48 Nigerian primary school teachers using a three-part questionnaire.	Teachers avoid equipment due to lack of tech knowledge.	19
Rosen and Weil (1995)	To study technophobia among public school teachers in an urban district of Southern California.	The study used a convenience sample of 587 school teachers from 60 schools across five urban school districts in Southern California.	Teachers' technophobia inhibits technology use in education. Experience is not the only cause.	656
Weil and Rosen (1995)	To investigate the level of technophobia among first year university students in different countries.	Longitudinal, cross-cultural study, sampling 3,392 first-year university students from 38 universities in 23 countries.	Public attitudes, culture, and technology access influence technophobia among first-year university students.	296
Anthony et al. (2000)	To examine the level of technophobia in South African university students.	Convenience sampling of 176 undergraduate students in psychology, computer science, and end-user computing using MTI and NEO-FFI instruments.	Technophobia hinders technology use; intervention is necessary.	160
Lam (2000)	To investigate technophobia and technophilia in education institutions.	Study explored L2 teachers' tech choices. Sample of 10 participants drawn from colleagues teaching English, Spanish, and French.	Teachers need training/ support to use technology effectively in education.	598
Salmon and Mathew (2004)	To examine staff's experience with WBL technologies in education.	Qualitative process evaluation used recorded face-to-face interviews, telephone interviews, and semi-structured questionnaires with project staff.	Technological illiteracy and technophobia hinder WBL implementation.	44
Arigbabu (2006)	To investigate the prevalence of computer anxiety among Nigerian undergraduate students.	The study used a questionnaire survey to collect data from 162 undergraduates in a Nigerian college.	A high prevalence of computer anxiety was observed among the participants.	10
Oyelude and Oladele (2014)	To investigate the leadership dimension in ICT adoption of librarians in Africa.	Mixed methods (personal communication, survey, observation, literature search). Population: librarians in Sub-Saharan Africa.	Older librarians' technophobia hinders young professionals; proper training is needed.	17
Bolandifar and Noordin (2015)	To measure the level of computer anxiety among Iranian teachers and explore their attitudes toward internet use.	The study used a survey questionnaire to collect data from 200 English language teachers in Iran.	Moderate computer anxiety and ambivalent attitudes toward internet in language class was observed.	12
Wang and Chen (2015)	To develop an effective program to help elderly people overcome technophobia and adopt e-health tools.	The study recruited 26 assisted-living seniors with no technology experience, using pre- and post-program questionnaires, and a modified 4-week service-learning program to teach technology-assisted self-care.	HELPS-seniors reduces technophobia and promotes technology use in the elderly.	16
Yunus et al. (2016)	To investigate the level of computer technophobia among adult undergraduates using e-learning tools.	Descriptive study with purposive sampling of adult students aged 27–50 who underwent UBI 3012 English course at UniSZA.	Moderate anxiety; female students were more technophobic than males.	11
Rajab et al. (2020)	To study the challenges of online medical education during the Covid-19 pandemic.	Cross-sectional study at Alfaisal University in Saudi Arabia using an online questionnaire for faculty and student demographics.	Online medical education faces challenges, including technophobia, but boosts confidence.	521
Bardakci and Ünver (2020)	To study how technophobia affects IWB integration in Turkey.	Qualitative approach; 80 teachers from different disciplines and regions of Turkey.	Technophobia inhibits effective technology integration in teaching practices.	01

Author(s) and Year	Research Purpose	Research Methodology	Findings	Citations
Daruwala (2020)	To examine the potential psychological consequences of using ICT during Covid-19 lockdown.	This was based on quantitative survey of 208 students and faculty members	Online communication in lockdown may cause technology phobia and data surveillance.	15
Pahamzah (2020)	To investigate technophobia in language teachers' professional development technology competence.	The methodology used is library research to investigate technophobia in language teaching using theories from scholars.	Language teachers face technophobia and lack competence in tech-based professional development.	00
Mercader (2020)	To identify barriers to digital technology integration into university teaching.	The study employed a sequential mixed methodology, using a questionnaire and semi-structured interviews, conducted in four universities.	Technophobia is among the main barriers to university technology use.	28
Khasawneh (2022)	Examine the impact of technophobia on technology acceptance in online classes.	Online course for undergraduate students with technical skills training on Microsoft Access and Excel, conducted via asynchronous material and virtual office hours. The survey collected data from 211 students at the end of the semester.	Technophobia can enhance ease-of-use with proper support.	02
Ajani and Buraimo (2022)	To examine the impact of library systems automation on librarians in Nigeria.	Descriptive survey research. Target population: 32 universities' library personnel in Southwest Nigeria.	Library automation positively impacts services, but technophobia and lack of support present challenges.	15