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Insufficient Access to Technology in Educational Institutions

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Abstract

Technology is one of the key factors present today that triggers learning and steers students towards their destiny. However, uneven access to technology continues to be a serious issue that widens the learning gap, especially among disadvantaged students and minorities. This research aims to examine the impact of insufficient access to technology on the learning outcome and the future opportunities for students. It is based on a sample of 50 students at the Suan Sunandha Rajabhat University Faculty of Education in Thailand who have previously completed a teaching internship and have varying socioeconomic backgrounds and therefore represent real perceptions and experiences as far as access to digital devices, use of the internet, and issues encountered by students at school are concerned. This evidence proves that limited technology has a great influence on disadvantaged students, inhibiting their academic potential and career advancement. On the other hand, students with better access to technology experience better academic performance and greater motivation. The study further indicates that online quality increases with increasing grade levels. It recommends investment in digital infrastructure, launching staff development programs, and constructing public-private partnerships to deliver a boost to education through an inclusive and fair learning environment, providing students with what they must create and flourish similarly in the future.

Keywords: Technology in education, Digital inequality, Learning achievement, Technological access, Future opportunities

1. Introduction

Technological advancements have marked the digital age and have also played a big part in changing educational methodologies. In fact, one of the major advantages that students get from technology is the access to tools and resources that could help them learn better and at the same time get ready for the future (Tientongdee, 2023). Most schools, however, still face the problem of not being adequately equipped with technology. This is especially the case with low-income schools that are short in computers, slow internet, and limited digital resources. Such problems create an education gap, thereby preventing the students from acquiring digital skills and becoming successful in academics.

The month-long observation of the classroom indicated that the teachers utilized the technology in different forms like online attendance, computer-assisted materials, work submission through learning systems, and electronic test conduction. On the other hand, a lot of schools still have to cope with the problem of old hardware, poor internet connection, and

limited access to up-to-date software. These issues are barriers that prevent the whole school community from benefiting from technology to the fullest and call for improvement in the technological infrastructure of schools very urgently.

This research report indicates that the digital divide is still wide as the students in low-resourced schools have not been able to get even the basic digital tools (ACT, 2024). In the same vein, (Public Policy Institute of California, 2023) has disclosed that more than 30% of K–12 families in low-opportunity districts suffer from lack of stable internet access. The situation underlines the fact that technological gaps not only slow down educational progress but also create inequalities and hence the necessity of tackling them to promote educational equity and equal learning opportunities for all students. Tables and figures should be numbered and references to them must be in the text. Acceptable labeling for a table is Tab.1 and Fig. 1 for a figure.

1.1 Research Objective

This research aims to investigate the impact of insufficient access to technology in schools on students' learning outcomes and future opportunities.

Specifically, the study seeks to:

1. To identify the technological problems that occurred during your internship.
2. To explore the possible solutions for improving technology access based on students' and teachers' perspectives.

This study is guided by the following research questions:

1. What are the technological problems that occurred during your internship?
2. What are the possible solutions for improving technological access based on students' and teachers' perspectives?

2. Literature review

Technology plays the role of a feedback mechanism that enhances the conventional methods of teaching and learning. It also enables learners to have an easy way to access resources and study at their own pace (Clark & Mayer, 2016). The use of multimedia tools such as videos and interactive slides greatly supports the process of understanding and memorization of the content (Mayer, 2021). The first part consists of hardware, while the second one is software. computers, tablets, VR, etc., are the main hardware components that help provide interactive learning experiences (Wang et al., 2022), while on the other hand, LMS and AI concern flexibility and adaptability in educational practices (Anderson, 2020). Moreover, month-long observations of classes indicate that the much needed but outdated equipment has a negative impact on teaching and learning; the same conclusion reached (Anderson, 2020) who finds support in (Johnson & Smith, 2022) who state that the quality of equipment and infrastructure are key factors in the provision of education. Helping students is just one aspect of the technology; it also improves teaching by better design and delivery (Darling-Hammond et al., 2021). In some schools the teachers get sufficient training on the proper integration of technology in the class (Selwyn, 2023).

Technology, though, has dissipated a lot of education problems, some still exist, like lack of devices, the infrastructure being outdated, and teachers having low digital skills (Johnson &

Smith, 2022) . Their recommendations comprise of modern equipment acquisition, infrastructure upgrade, and teacher training (Li & Ni, 2024). So, the technology-related problems will, in a way, push further technological advancement of education.

3. Methodology

This study employed a qualitative data collection approach, facilitating observation and documentation through the deployment of open-ended questions. Data were collected from 50 participants, who were sophomore to senior students who took internships, using a questionnaire administered via Google Forms. Use the calculation method using a graph.

Used four open-ended questions and one closed-ended question as follows

- 1.What is the problem of researching technology during pre-service teaching internship?
- 2.From observing the teaching, what are the impacts of technology?
- 3.What is the impact of limited technology in education?

(It's an open-ended question to give your opinion.)

4. What do you think could help improve technological access in your school?

-Providing more computers/tablets in classrooms

-Improving internet access in school

-Training teachers to integrate technology effectively

-Allowing students to bring and use personal devices for learning

- 5.Should the school you observed during internship be considered for future visits and why?

The qualitative information collected was analyzed with a thematic approach. Responses to the open-ended questions were categorized into major themes from dominant patterns and understanding. Thematic analysis allowed the identification of common challenges, perceptions, and suggestions regarding the use of technology in schools. Further, the closed-ended question was analyzed using a graphical presentation to visualize the spread of the answers.

To ensure accuracy and reliability, the answers were read and coded in a stepwise fashion. A content analysis was conducted to understand the level of technology limitations within schools, how they affected instruction and learning, and likely approaches to further strengthen them. To collect feedback and results.

4. Results

The internship feedback outlined a lot of technological problems. The most notable one was equipment and media shortages, which was indicated by 26% of the schools. The shortage of basic tools like computers, television, and projectors was among the major reasons for the poor educational experience. Access to sufficient technological resources is a must in learning (UNESCO, 2020).

Besides that, the connectivity problems (20%), the slow or unstable network made it hard to prepare lessons, and online learning was disrupted. Such hardships are prevalent in lesser-funded schools (World Economic Forum, 2021). It was a concern when the teachers could

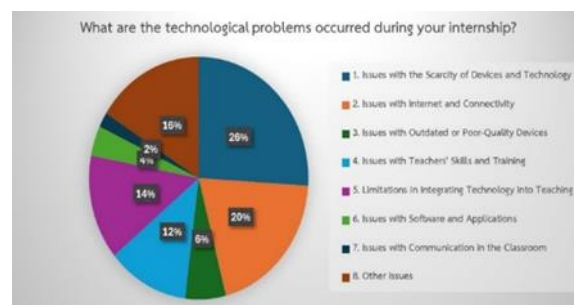
barely use technology to its full extent due to old equipment (6%) since modern tools are important for effective learning (EdTech Magazine, 2022).

Teachers' skills and training (12%) would also function as the roadblocks to the evolution of technology in schools, while some teachers just do not have the right skillset or the will to use them. Though, training is a significant part of teacher education because the successful integration of technology relies on it (Educational Technology & Society, 2022).

Teachers' discomfort with technology in the classroom (14%) could be attributed in part to problems with the assessment process, lack of standardization, and resistance from both teachers and students. Such matters plainly reflect the necessity for much more planning and support with regard to the use of technology (Hennessy et al., 2021).

There were also reports on application failures and systems crashing, which were not supportive of the use of the programs, along with communication issues between instructors and students being less deep because of technology (4% and 2%) (World Economic Forum, 2021; UNESCO, 2020). A lot of other problems (16%) were environment-related, for instance, limited air conditioning, lack of tools, and absence of advanced training on technology integration in teaching (UNESCO, 2020).

Figure 1: The pie chart illustrates the technological problems Encountered during the internship.



The respondents mostly scored (31%) in the aspect focusing on improving internet access. Improved and high-speed internet is essential, especially in today's online learning, access to educational resources, and interactive classroom activities. Various studies have suggested that reliable internet connectivity is the foundation of modern education (OECD, 2020).

Then, in line with the suggestions, bringing more computers/tablets in classrooms is the second most responded to by 30% of respondents. Having more access to devices can enable learning that is personalized and support development in digital skills and improved student engagement with multimedia resources (Van Dijk, 2021).

Moreover, (22%) priority was to train teachers to integrate technology. The ability of teachers to effectively use technology affects the learning outcome of a student, which agrees with research that states well-trained teachers are better equipped in fostering the use of technologies for enhancing teaching (Hennessy et al., 2020).

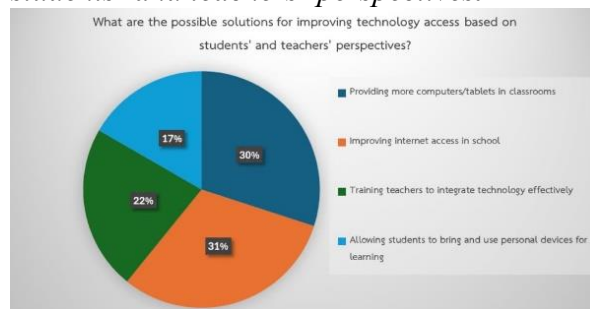
Finally, allowing students to come and employ their devices to learn in school was tagged as a viable solution (17%). Student solutions are then scanned and the ornaments' honor

compared skipping through the student's records using their own devices, though this solution raises walls of equity and compatibility of devices.

Improving internet access, increasing device availability, and adding training such as that for teachers are considered major areas of intervention for enhancing technology access and integration in schools.

Figure 2:

The pie chart presents the possible solutions for improving technology access based on students' and teachers' perspectives.



5. Conclusion

The research indicates that lack of technology access is a significant factor in determining the quality of learning, students' interest and their participation in class activities. A total of 26% of the people who were questioned stated there was a lack of tablets or computers in the classes and laboratories while 20% pointed to poor internet connection as the most important barrier. The absence of technology not only causes learning gaps but also drains students' motivation. Besides this, 16% pointed to insufficient teacher training and 14% said that the limited use of technology had a negative impact on the quality of education.

Moreover, 12% of the participants were in favor of the Bring Your Own Device (BYOD) initiative which permits students to bring and use their personal gadgets in the place of scarce resources. 6% have mentioned software or technical problems in accessing online materials as their complaint. The shortage of technology puts a stop to students' gaining of the important digital skills that are necessary for both academic and career success.

In order to overcome these challenges, schools could try out the options of lending mobile hotspot devices, sharing of devices in a structured way and providing content that can be accessed offline. Teacher technology training significantly boosts learning as well. The transitional solutions may be of help but investing in durable long-term technological infrastructure is a must in order to provide equal access and prepare students for the future.

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