

Summary of Research Findings

The challenge we are tackling in our project is the misuse and overuse of technology regarding education and some possible solutions to overcoming these challenges. This is important because technology is used in almost every facet of life today, so it is only logical that technology should be used in schools as well. Technology can allow benefits like instant feedback, personalized learning, student self-efficiency, educational support, and diversity in learning. While technology can be beneficial to both teachers and students, it does have its disadvantages. Challenges like cheating, access constraints, inadequate training, and teacher and student attitudes can make it difficult to successfully implement technology in the classroom. Technology must be used properly and positively in the classroom, otherwise, it can harm student learning, problem-solving, engagement, and self-efficacy.

Through Braeden's research, the majority of his findings point to the idea that while technology—specifically AI—has made doing tasks much easier and faster, (brainstorming was highlighted as being an area that chatbots are a great tool for streamlining, although there are still caveats), this can and has sort of led to a bit of an over-reliance on technology like Chat-GPT within and outside of the classroom. Particularly in the classroom, this over-reliance has led to a decrease, or at the very least, a hindrance, in students' development in areas like creative thinking, problem-solving, critical analysis, and evaluation, among others. Studies also found that there can be issues like a transference of bias or stereotypes from the chat software to the user, which if left unchecked, can lead to further circulation of those negative or faulty mindsets. All of that being said, there are positive elements to AI and tech use, such as brainstorming,

simplifying or paraphrasing language for Multilingual Language Learners, rewording your language to better fit your audience, etc. The key, which was what Braeden really wanted to look into, was that we need to teach concepts of digital literacy in order to combat the negative effects of tech use. Digital literacy is an important skill for every citizen, not just those using AI regularly; these skills help students interpret and evaluate the information they are presented with online and in digital spaces, and improve not only students' ability to critically think about whatever output AI is giving them, but also improves their competence and self-awareness on the internet in general. We also should be teaching our students *how* to responsibly use AI; there are frameworks and methodologies that make sense, but students really need to understand how to use the tool correctly.

This research informs our problem because it helps us to understand how an over-reliance on technology is affecting the development of our students (although this over-reliance is not necessarily relegated to students only; adults can easily fall into this trap as well). This research helps us build a better big picture about the positives and negatives, and also informs us as to some of the ways to mitigate those negatives and navigate those challenges, especially as the use of AI and other technology within and without the classroom is only going to go up.

One solution that we would propose from this research is to construct digital literacy and ethical AI-use classes, or at least units of study, that every student (and faculty member) should have to at least be presented with. Digital literacy is an incredibly important skill in our increasingly technologically-dependent world, and there is very little we will be able to do to deter students from using AI. We need to develop their critical thinking and evaluative skills both independent from and in conjunction with AI use, but we also as educators need to both possess

these skills and be able to teach them to our students, which will most likely require professional development opportunities.

Through Makenzie's research, we learned more about the benefits of technology and how we can use it to improve the educational experience of students. Before we are able to use technology positively, however, we need to ensure that students and teachers have consistent access to a device (and a way to charge them), internet connection, and support. Without these basic items, teachers cannot seamlessly integrate technology into their classrooms. Once we solve the issues of devices, internet connection, and technology support, we must then tackle the attitudes and beliefs of technology from teachers.

Many teachers report that they are not confident in the use of technology and do not have enough time to find or test the effectiveness of technology. Johnson, A. M. et al. describe the notion of "double innovation" due to the nature of the additional layer of preparation that technology requires. This was true in Makenzie's survey, as it took time to prepare each question, and made Makenzie realize that even after all the time she took to construct it, Makenzie still did not think of every possibility that could come from it. The same journal article suggests allowing teachers to give feedback on the technology used can help with teacher's attitudes and confidence. Schools should also implement a better organization of technology that is available to teachers and provide professional development that is specific to the technology for the best outcome of teacher learning.

In addition to teacher attitudes toward technology, teachers need to remember that while students may be "digital natives," (born into a world with technology) students do not all have the same technological knowledge. One great example of this is the article "Students struggle with Tech, too" by Victoria Thompson. Thompson mentions an observation where high school

students were asked to create a 15-minute video for a project. Because students used platforms like YouTube and TikTok to *watch* videos, the teacher assumed students would know *how* to make a video. It is important to remember that just because students use technology does not mean that they know *how* to use the technology. Teachers still need to provide proper scaffolding to students to successfully implement it for assignments and activities.

Besides improving all of the challenges with technology, we can look at how we can use technology to improve student learning in the classroom. The article from eSchool News is a great resource on possible technologies to enhance student learning. The article lists 10 examples including items like online science simulations, online collaborative writing tools, digital portfolios, and possibilities with virtual (VR) and augmented reality (AR). While AR and VR are not yet a widespread implementation in schools, it is an interesting look into the possible future of education and how we can use these tools to support student engagement and learning.

Through Nicole's research, we first learned that there may be correlations between students' performance level and their ability to concentrate when using technology. The majority of students said that they are sometimes to very often distracted by non-educational technology during schoolwork, and there was also found to be a relationship between lower grades and more frequent escape into technology during schoolwork. A proposed solution for combatting this specific portion of the research includes schools gaining insight in how their different performance groups engage and disengage with technology, so that disadvantaged students do not remain disadvantaged. In this regard, it is crucial that schools and educators approach engagement along with disengagement. We must recognize that students engage differently with technology. It is crucial for schools to pay attention to the diversity of learning styles for the purpose of allowing teachers to create technological learning experiences tailored to each

student. Technology should be used in a way that allows students the opportunity to feel more involved in and responsible for their learning.

From Nicole's field research, over half of the students reported that they feel their teachers over rely on technology in the classroom. 71.4% of surveyed students said that they have felt that technology used in school made them less motivated/more apathetic toward learning, and the factor that contributed most to this was over-reliance on technology and boring or repetitive tasks. The proposed solution to combatting over-reliance on technology, and boredom due to repetitive tasks, comes down to schools and educators continuously assessing the technology's impact on student learning. After all, one of the benefits of technology is that it allows learning to become student-centered, but instructors take an integral role in making sure that plays out. Before introducing new technology, it must be considered whether its features masks the desired task outcomes. The technology must be easy for both the student AND teacher to engage with. When using technology, teachers are faced with the challenge of not only delivering content, but teaching digital competencies to students. Studies show that there is not adequate time to do both of these things in class. A focus on increasing digital competencies for both student and teacher, outside of specific content areas, would reduce boundaries in delivering content via multiple types of technology.

The demands of student learning are constantly changing and growing, and the way technology is used must mimic that. Technology offers many excellent opportunities to increase student's interest and willingness to learn, but it must be used in the appropriate way. As said in the research of Chloe D'Angelo, "when students perceive that the attributes of a given technology are engaging and beneficial to their learning, they are likely to adopt that technology and use it to enhance their understanding of course content". Chloe D'Angelo's research also

looked at specific research which makes technology more appealing to students, and those included flexibility, accessibility, overall engagement, and ease of use. This aligns with Nicole's data collected from the field, where students agreed that the part of technology that made it the most engaging was its accessibility. To increase student engagement, teachers are recommended to provide continuous feedback to students while using technology. Another proposal is that more research should be done pertaining to methods of implementing technology in the classroom, as a lot has shifted in this regard, even in the last few years.

While technology can be used to improve education, there are still many challenges that need to be faced to get there efficiently and with little error. It is clear that technology is here to stay, so we must find ways to improve student's skills, attitudes, and experiences with tech within our classrooms. Using technology as a way to improve engagement and interaction in lessons as well as using the opportunities to teach digital literacy are two main ways to tackle many of the challenges that come with technology. Improving internet connection in schools and giving all students devices is step one in successfully integrating technology into schools.