The Social Construction of Educational Technologies: Kids, Screens, and Social Skills

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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STS Research Paper

Modern Learning Challenges

Currently defined by rapid advancements of technology, our educational system is undergoing a profound transformation. Technologies such as artificial intelligence, virtual reality, and automation are not only reshaping how we learn but also posing new challenges overall. While these innovations can drive economic growth and address societal issues, they also introduce potential risks like ethical dilemmas, technological dependance, and environmental impacts. These issues ignite ongoing debates about their proper integration into education. Nevertheless, given that technology is an essential component for sustaining civilization, integration into education is therefore unavoidable (Ghory, 2020).

The impact of technology regarding child development seems multifaceted. On one hand, technology has opened a world of information and resources, providing children with access to a wealth of knowledge; However, ease of access might affect critical thinking and other aspects of a child's well-being and overall development. The surge of tech's usage has sparked great concerns regarding social and cognitive effects not only towards children, but also other age groups as well (Gottschalk, 2019). To fully understand the long-term effects, it is crucial to examine technology's benefits and drawbacks. Specifically, how does the rapid advancement in modern technology influence children and teen development, including their cognitive skills and the development of social skills? While diving deeper into the evidence gathered during my research, perspectives can tend to vary between the different types of technology utilized which leads to framing the research based on the STS framework SCOT, the Social Construction of Technology.

Investigating Tech's Role in Education

Regarding tech's role in education, the following research will focus on children and teen development, educational technology and their contribution to social and cognitive skills. To fully understand the long-term effects, it is crucial to evaluate both the benefits and drawbacks. The methods utilized in the following research include multiple stages of data collection, case studies and survey findings from parents, teachers, and students, analyzing their attitudes toward integration of technology into schools. The surveys consist of questions, detailed in the Appendix below, exploring parents' perspective about their children's experiences with educational technology. For example, how would they describe the impact of your youngest/oldest child's computer/laptop use on their learning experience? As a supplement, graphical representations from teacher surveys were also listed in the Appendix. Additionally, I reviewed quantitative research papers with keywords such as "online learning," "AI educational platforms" and "educational technology." Once all the information is collected, the results and discussions will be structured by each different social group influencing the educational technology, implementing the use of SCOT as the framework.

The Evolution of Technology in Education

Technological advancements play a crucial role in meeting the evolving demands of society by making life and work much easier and less time consuming; Therefore, it is seen as a cornerstone of growth within our economy. As time progresses, the application of tech in multiple sectors cannot be ignored, especially in the educational sector. Back then, the most

accepted mode of instruction to students was directly from the all-wise professor. Many believed that educators were immune from the advancements of technology, but the increased rate of advancements in technology has now threatened to burst this bubble (Molebash, 1999). Considering this unavoidable reality, it is imperative that we understand the purpose behind tech's integration. The primary goal of technology within a typical educational setting is to further enhance the speed and volume of obtained knowledge and skills by increasing efficiency and effectiveness (Graafland, 2018); However, the impacts can be both positive and negative.

During the COVID-19 pandemic, schools and universities throughout the world shifted to online learning to deliver an education to students despite health and safety risks. The drastic change affected not only students but also teachers and parents across the world (Tadesse, 2020). In regards to online formats, students tend to face obstacles including a lack of engagement and motivation, disconnect from course staff and resources, fewer opportunities to collaborate and much more. Teachers also struggle with certain areas of technology and can sometimes lack the infrastructure availability; Nevertheless, various of technological initiatives were underway to make sure study activities continue in spite of absence of face-to-face schooling (Simamora, 2020).

The crisis truly prompted a fundamental shift in the way technology is integrated into educational spaces, and it seems to have a long-lasting effect. The surge wasn't limited to just online classes. Usage of innovations like AI-powered learning assistance, virtual classrooms, and personalized learning platforms has heightened. It is crucial to explore the current situations and issues at hand with education, whether online or in person, to provide a better understanding of ways students, parents and the instructor's experience might be improved (Dumford, 2018). With the continued rise of technology integration and evolution in the educational sector, this paper

will further cross examine all the data and critical research gathered. In doing so, the research will provide deeper insights into addressing the fundamental question regarding technology's impact on young minds.

Evaluating Social Shaping and Tech Utilization

When it comes to the research question, there are several factors that contribute to the problem at hand and understanding their aspects and their utilization of technology will be key to the investigation. To dive deeper into this approach, the use of SCOT, The Social Construction of Technology, is utilized to explore these different social interactions. SCOT helps examine how social, political, and economic contexts shape the development and use of technologies. Not only does the framework emphasize that technology is not just a product of progress, but also that social and cultural practices influence the way it is interacted with. While a great approach for understanding the innovation of artifacts, it can also be used as a starting point for exploring longer term technological issues by identifying meta-categories of relevant social groups (Humphreys, 2005). This perspective will be a valuable tool to utilize as it will help view technology as a socially influenced force, not an independent one.

Utilizing SCOT highlights that the different social groups involved have different interpretations and uses of technology. This is crucial as the relevant social groups are easily identified and investigated, leading to the groups being parents, children and teachers. SCOT will also emphasize the importance of social shaping of tech, allowing for the analysis of these different social groups and how they influence one another and how they are influenced by technical advancements. Understanding these diverse perspectives will paint the picture for the

rest of the research, helping understand how children adapt, resist, or innovate in response to new technologies, affecting their social and cognitive skills.

While SCOT analysis can be helpful with analysis, there are still critiques out there with the framework in the context of analyzing technology. The main issue with SCOT that other authors agree with is that SCOT tends to focus more on the social construction aspects and may understate the properties of technologies themselves. Specifically, limitation will rise when examining specifics of tech which directly impacts cognitive and social development. For example, in Prell's paper, she discusses her research on an information system called Connected kids. A case study guided by SCOT and the various social interactions that surround and influence technology design. Their story illustrates SCOT's concepts, but while reflecting, she noticed a flaw in the analysis. Providing a detailed SCOT description, she pointed out that SCOT analysis can also lead to cloaking the strongest influences in a technology's design (Prell, 2009). Instead of only the many SCOT insights, there were other resources that were critical that collectively shaped the success of Connected kids. While SCOT offers valuable insights into the social contexts of tech, the authors also agree that working with other frameworks will help provide a more comprehensive understanding of your research.

Insights into Social Groups' Tech Interactions

Rapid technological advancements impact children and teen development, influencing their cognitive and social development overall. As technology further integrates into education, the benefits offers such as enhancing critical thinking through interactive and adaptive learning platforms. By catering to individual learning experiences, these tools help foster problem-solving

capabilities and subject specific knowledge as well. SCOT throughout the research reveals that educational technology's effectiveness depends on the interactions among children, parents, and teachers so the effectiveness of technology in a child's development is influenced by these three key social groups. Limited exposure to new technology among these groups can hinder children and teens from fully benefiting from technological advancements. Overall, the use of educational technology does benefit children in the long term according to the data collection and survey findings!

According to SCOT, these open-ended questions and responses provided a narrative for us to understand how different groups can perceive and interact with educational technology. They allowed the researchers to provide qualitative data that aligns with the SCOT's focus of the social shaping in technology. By relating all these gathered experiences, the critical questions about the increased usage in classrooms, technology's effect on children and their environment, and the impact on all educational stakeholders will be answered.

Children

As technology is on the rise, as well as the usage throughout all age groups. Globally, children and teens are more connected than ever, whether be using the internet for gaming, social networking, or engaging in entertainment content. The rapid adoption of online technology in schools, colleges, and universities has the goal to provide new learning opportunities that'll surpass traditional methods. The framework SCOT, the Social Construction of Technology will help explore how these advancements impact cognitive development and social skills in young people, considering both positive and negative effects.

For academic success, activities which promote higher-order thinking, reflective learning, and interactions through connected/collaborative learning and engagement are essential. Advanced educational technology offers many benefits, such as access to vast information and facilitated self-directed learning. This ease of access allows children and teens to broaden their knowledge base. Still, overreliance on technology for answers can also impede the development of critical thinking and problem-solving skills. Teachers are responsible for integrating technology in their teachings, so their role is crucial in ensuring that the technology does not hinder their future regarding their overreliance in technology.

According to the data, long term cognitive effects for children include improved cognitive skills and academic performance; However, long-term dependency can reduce focus on deeper learning experiences. Socially, continued engagement with educational technology will foster a sense of community, increasing social awareness; And yet, reliance on digital communication like Zoom and Skype platforms can lower interpersonal skills and lead to social isolation. To avoid this, parents need to be more involved and mediators in their children's interaction with technology. Guiding them through these digital tools and platforms will help foster critical thinking and responsible usage.

Teachers

Teachers are the backbone of education and set the foundations of learning by providing insight on different subjects and overall knowledge, hence nurturing the social and mental intelligence of our children. Understanding their perspective and influence on educational technology is crucial. According to an EdWeek Research Center survey conducted, most educators believe the recent investments in educational technology are increasing academic success, with over half stating that one-to-one computing helps address individual academic

needs (EdWeek, 2022); However, nearly the other half feels overwhelmed by the enhanced tech use. The Social Construction of Technology framework, which helps emphasize that technology is shaped by the social contexts and groups interacting, will be effective in analyzing educational technology's integration. Teachers are part of the three key groups whose interactions influence technology use, especially regarding children.

Teachers struggling to adapt heavily impacts the effectiveness of their teachings. If educators are not comfortable or proficient with these new technologies, it can lead to several proven issues such as the reduced quality of instruction, the limited ability to cater to individual needs, increased stress and burnout, missed social skill development activities and communication among student, as well as widening the digital divide. This interaction with educational technology can hinder children and parents since the teachers are the creators of the curriculum, proving that teacher's acceptance and attitudes towards educational technology significantly shapes implementation in classrooms. Thus, if teachers become more proficient and positive about the integration of these rapid technologies, the result will drive further children's development and refinement of these tools.

Schools need to do better in providing support to attack these challenges head on, leading to questions being asked about challenges their educators faced while using technology for teaching purposes on a public-school survey conducted by the National Center for Education Statistics (NCES). Twenty-two percent said that outdated computers or software was a moderate challenge. Other twelve percent said that was a large challenge. Twenty-six percent of schools said that lack of support on how to use technology for teaching was a moderate challenge and other eight percent said it was a large challenge (Gray, 2021). By equipping educators throughout the globe and all economic classes with the necessary training, support systems and

resources, they can ensure that technology will be used effectively to positively influence both cognitive and social development in children.

Parents

Parents, influenced by their egos and the opinions of other parents, teachers and public figures, play a crucial role in their children's learning process. A survey was completed by forty-six hundred parents from 19 different countries during the pandemic lockdown in 2020, filled with questions that identified factors that'll contribute to parental acceptance and the use of technology in support of their children's learning (Osorio-Saez, 2021). According to the results, parents were more eager to engage in their children's learning when well-structured technological tools were either provided or suggested by schools. More importantly, they were less engaged when they encountered challenges utilizing technological tools beyond their understanding. The statistics are very alarming because parental engagement is essential for improving educational outcomes, their behaviors and attitude towards learning heavily impacts their child's learning processes. The SCOT framework is useful for analyzing these dynamics, highlighting parents as a social group which influences educational technology.

For example, as parents took on the roles of teachers during the pandemic, children and teens' learning needs increased and differed from child-to-child Parents who struggled to adapt to these rapid advancements in tech, especially during those times where parental engagement was now more needed than ever, noticed what their problems were. A common struggle identified was their technical skills, helping their children navigate the educational technologies. Another big struggle was resource limitations. Access to devices, reliable internet, and other resources are seen as a big barrier for many families, limiting their ability to help support their child's digital learning. Out of all the struggles parents tend to run across, a big one is their

digital literacy. Many of these new tools, apps and educational platforms were created recently with the new AI boom, and some of the tools most parents are familiar with are very outdated.

By addressing these struggles, parents will mitigate these challenges and become more supportive in their children's education. Parents' perspectives and support plays a critical role in how children use technology at home and in school. Their involvement definitely enhances or will hinder the benefits of educational technology.

Limitations

More research is necessary to fully understand the benefits and limitations of rapid technological advancements in education and their effects on children's cognitive and social skills. While surveys, case studies and interviews provided valuable insight, the integration of AI educational tools and digital platforms since 2020 has introduced new dynamics which requires more research. Long-term research will be needed to provide more insights into the long-term effects of technology's use on children's development. For example, tracking a cohort of students over several years could help reveal their interactions with evolving educational technologies and how their prolonged use of these technologies influences the students' academic abilities over their school years.

Another suggestion for future research is examining multiple groups with different levels of technical skills, assessing their variation in cognitive development. For example, selecting groups with higher levels of technology integration into their education versus groups with more traditional, low tech educational settings. In doing so, this approach will help researchers evaluate the difference in student participation, collaboration, and view their learning outcomes

and their social/emotional well-being. Overall, this will lead to a more informed approach and provide more data to interpret the results in context to the final research question.

Future Directions in Ed-Tech Learning

These advancements in technology have a significant impact on children and teens' cognitive and social development. The effective involvement of teachers and parents, supported by schools, proper training and resources are necessary to maximize the benefits all while mitigating challenges faced by this drastic shift. The support and guidance can and will ensure that technological advancements can contribute positively to this change, ensuring that all students have access to these tools and help bridge this educational gap some social groups face, promoting equality. Exploring both the positive and negative aspects based on research and my findings places an emphasis on the crucial role that teachers and parents play a part in the technological integration process for children and teens. Recognizing and addressing these aspects thoroughly provided a deeper understanding on how to effectively harness the benefits of rapid advancements in tech and foster cognitive and social growth for future generations. Future research still needs to be done, both long and short term. Further addressing the evolving impact of technology on education and ultimately prepare our young ones for a future where digital literacy and social skills are equally valued is a must.

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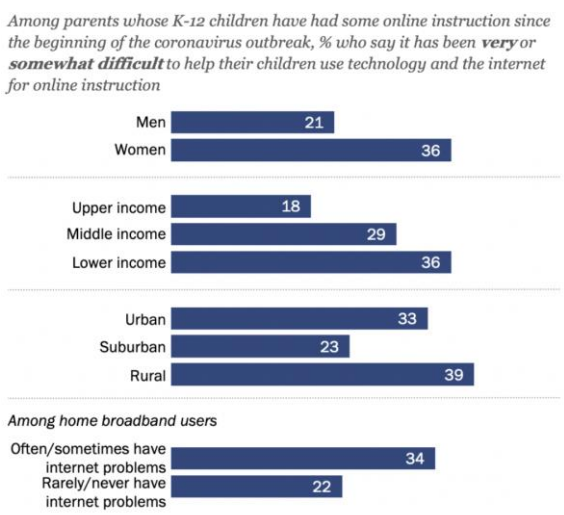
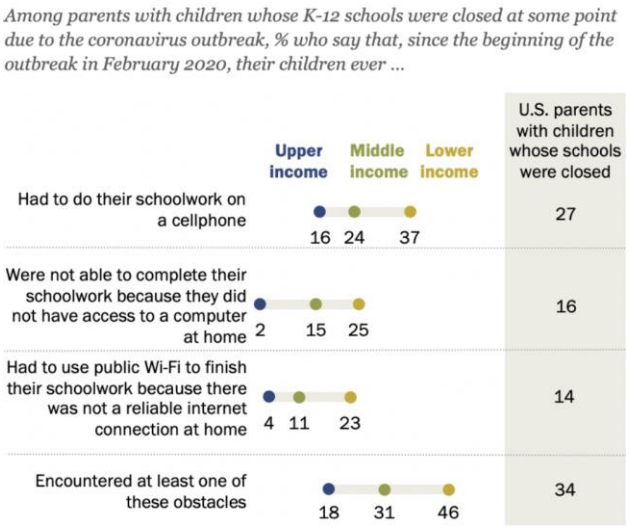
Appendix

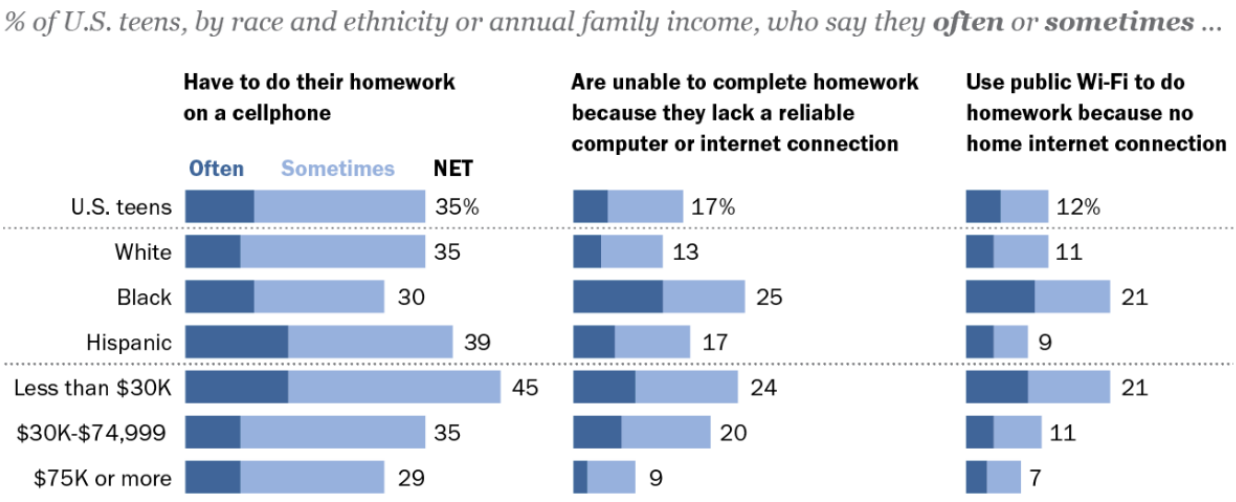
Survey Questions

1) How would you describe the impact of your youngest/oldest child's computer/laptop use on their learning experience?
2) How would you describe the impact of your youngest/oldest child's technology use on their social emotional development?
3) When it comes to how much time your youngest/oldest child spends using technology generally? Too much, About Right or Too Little?
4) How many of your children, if any, are taking at least one gifted, advanced, or honors class at her/his school?
5) When thinking about the future, please select which of these words best describes how you feel right now? Hopeful, Sense of Purpose, Happy, Satisfied, Optimistic, Enjoyment, Enthusiasm, I feel in control.
6) Do you feel things in K-12 Education are generally going in the right direction, or do you feel things have generally gotten off on the wrong track?
7) To your knowledge, does your child's school provide mental health services to students who need it?
8) Would you like for your child's school to offer mental health services to students who need it?

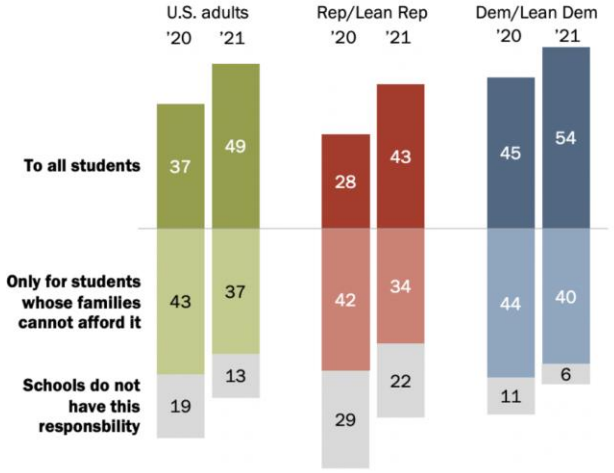
Graphical Representation



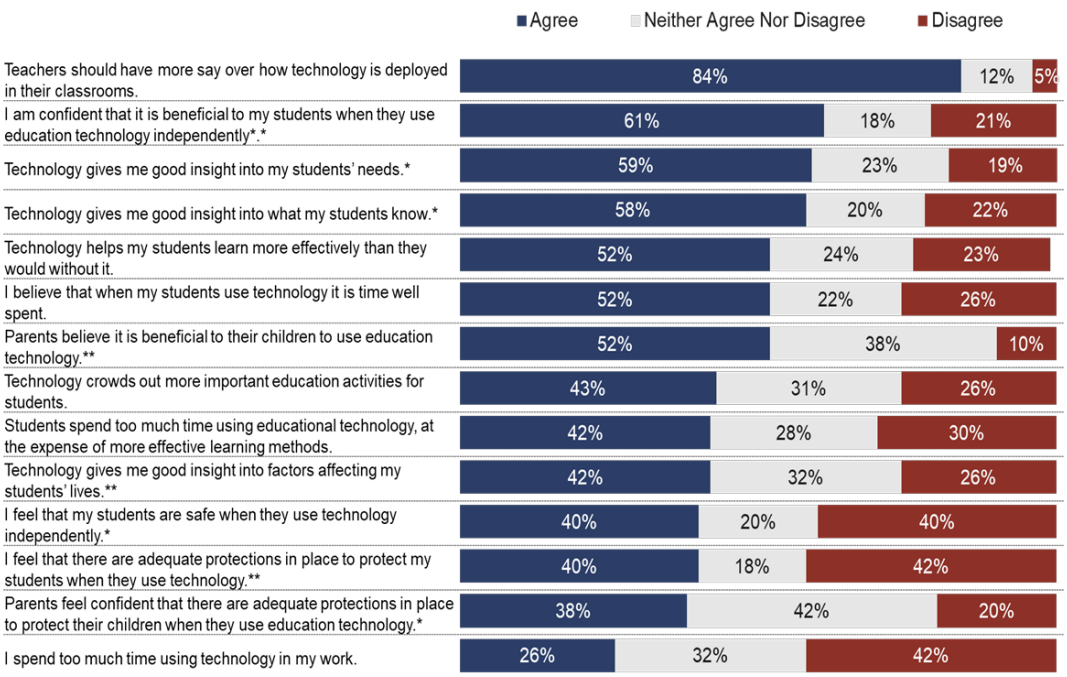




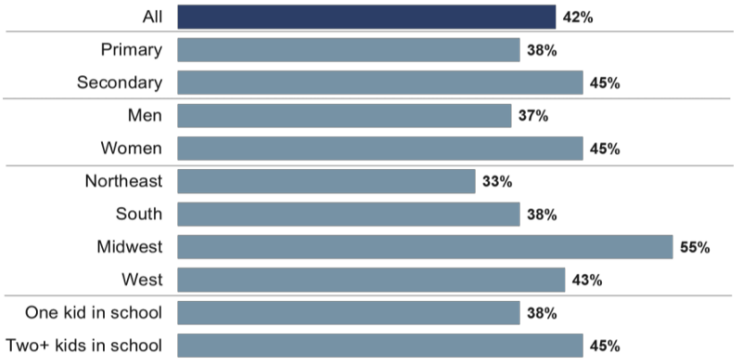
% of U.S. adults who think K-12 schools have a responsibility to provide laptop or tablet computers ___ to help them complete schoolwork at home during the coronavirus outbreak



Teachers' Attitudes toward Educational Technology



Percent of Parents who Feel They Have Little/No Control Over Use of Education Technology in Their Child's School



Percent of Parents Reporting their Child Uses A.I. Tools Occasionally/Daily