

## **Technology Integration in School: A Study of Students' Perception of Edtech**

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**Abstract:** Educational Technology (EdTech) has become an integral part of the learning landscape in today's digital age. This study aims to address the significance of students' perspectives and opinions on the impact, advantages, disadvantages and potential of EdTech in schools. As edtech continues to evolve, it is crucial to gauge how students perceive its role in their education. Our research involved a survey conducted across multiple schools spanning various geographic locations. A structured questionnaire was administered to students to assess their opinions and experiences with edtech. The survey encompassed questions related to the influence of edtech on their learning, its advantages, and potential drawbacks. The findings of this study illuminate the multifaceted nature of students' perception of edtech. A significant portion of respondents acknowledged the positive impact of edtech on their learning experiences, citing increased engagement, accessibility to resources, and enhanced interactivity. However, concerns regarding distractions, overreliance on technology, and inequalities in access were also raised. Notably, a majority of students expressed a desire for a balanced integration of traditional teaching methods with edtech.

**Keywords:** Edtech, digital age, education, students, technology

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### **Introduction**

Technology has widespread use and integration and has played an important factor in contemporary society (D'Errico 2007). And as such it has also had a role in the development of education, offering new and different possibilities (Esposito, Sangrà, and Maina 2013). This integration into attention has also begun to gain significant attention worldwide (Twenty Years of Edtech, 2018). Educational Technology often referred to as EdTech, encompasses a range of tools and platforms that attempt to enhance the teaching and learning experience. Technology has been constantly used in education since the 1920s and it was in the 1980s and 1990s that computers were introduced to assist in teaching students (Cuban, 1993). Education has always been considered a dynamic field, evolving to meet the needs of the learners to suit the ever-changing world (Abdessalami, 2019). EdTech claims numerous advantages over traditional teaching methods through personalized learning experiences, increased engagement and motivation, improved collaboration and communication, access to a wealth of resources and adaptive learning pathways along with data-driven insight (Lazar, 2015), as such More recent trends have been towards personalized and adaptive "student centered" models of learning (Johnson, Adams Becker, Estrada, & Freeman, 2015) EdTech also presents challenges and considerations that need to be addressed, notably, infrastructure limitations, accessibility issues, teacher training and support, security concerns, digital literacy requirements and the need for ongoing research on best learning practices. As technology continues to advance it's important to also consider the future directions of EdTech (Lazar, 2015).

This research paper focuses on the advancement of technology and how it has revolutionized the world in the field of learning in education by going deeper into its implications on students and learning. Technology, being one of the greatest inventions by humans, continues to benefit our human lives by being more practical and a necessity to live in the modern era. Computers are one of the major success stories of new technology which has changed how we live. As technologies advanced, so did businesses and slowly adopted implementing such technology into their work processes and its lifestyle into office spaces. From technology being in sectors such as healthcare, IT sector, finance, food service, it has gradually increased to the point where things cannot operate smoothly. A country cannot develop without the need of technology.

In terms of education, traditional on-class learning has always been the most effective way for a very long time. It has proven to be the most preferred method to study. For the past few decades, education researchers have been exploring the different ways how innovation in technology could be integrated into

traditional learning so that it could enrich learning experience and effectiveness. Due to the various pedagogical and innovative technological innovations, new learning environments can be created in order to optimize students' ability to learn. Especially true in the Covid-19 era, many schools had to put a halt to traditional learning being face-to-face. During the pandemic, many school systems had to go through a revolution of teaching in person to teaching online. Similarly, the educational sector encountered many problems from schools to universities being closed and further problems faced from switching from traditional school to a new online paradigm. This shift caused half the population to be affected by education globally (UNESCO, 2020).

The situation arises to where the integration of technology in schools is important, and teachers have to update and regulate their competencies of teaching without impacting the quality of education. This resulted in changing the curriculum and their instructions. Even though teachers were familiar with softwares such as Power point and Smart Boards, their practical employability is still needed in such teaching practices (Nikolopoulou and Gialamas, 2016; Guillén-Gámez et al., 2018). In this time, it raised the period of learning basic ICT techniques and methods in order to gain competency in teaching practices.

Integration of technology has always been a big issue due to a big commitment issue among various shareholders such as school managers, teachers and parents (Lim, Zhao, Tondeur, Chai, & Tsai, 2013). Further, it is important to be aware of the principles and guidelines of successfully implementing technology in classrooms. There should be an effort in improving classroom construction in order for more effectively leveraging technology for learning (Schaffhauser, 2016). Teachers should be motivated as well as engaged to develop school friendly based technology plans as it will give them an opportunity to reflect on their need of a specific need of technology, which can be used for a specific use. Important leadership roles can be given to teachers in developing a commitment to change and changing the view around technology implemented in schools. Close collaboration with the school community and other shareholders should have a clear and critical shared vision for the correct use of technology in schools. Additionally, teachers should be trained on a priority basis for developing a technology-related professional environment that is suitable for all (Lim et al., 2013).

Technology in schools aims to create new learning environments by better supporting teaching and learning activities in different subject areas at all levels of the school. It emphasizes learning flexibility, higher effectiveness, time management and more reflectiveness of work, in which formal and informal learning can happen. It is argued that technology can enhance learning through the adaptation of individual traits and preference, and with a greater form of engagement between the teacher and the student, there is going to be timely feedback and guidance and additional provision of media-rich contents.

This paper aims to explore the effectiveness of such EdTech in education, providing a comprehensive review highlighting possibilities, benefits and challenges and their impact on learning outcomes.

## **Literature Review**

### **Definitions and Scope of EdTech**

#### **What is EdTech**

Educational Technology, commonly referred to as EdTech/EduTech is the use of hardware, software and educational theory to aid in or facilitate learning (Rhonda et. al., 2015). The abbreviation Edtech is often used in the context of companies that create educational technology and their products (Mastellos et al., 2018). E-learning impacts learning in different ways depending on the implementation, the range of which it assists in or replaces other forms of learning is variable ranging from a blended learning environment to completely online learning (Miltenoff, 2004). Descriptive terms have been employed although somewhat inconsistent do categorize the level at which technology is being used in that learning environment "hybrid" and "blended" learning often being used to refer to presence of aids in the classroom such as laptops or an approach where traditional classroom time is not completely removed but replaced with a degree of online learning (Baker, 2013).

#### **Different Educational Technologies**

Audio and Video have been prevalent in teaching for ages but began to take off after the release of YouTube which jump started video learning (Twenty Years of EdTech, 2018). Computers are often mirrored to devices like projectors to relay content to a larger audience. Along with this computers, tablets and other mobile devices allow for a more collaborative learning approach while allowing for access to various websites and applications that can aid in the learning experience (Kolpashnikova & Bartolic, 2018). And in fact, computers in classrooms have been shown to increase rates of engagement in classrooms (Schindler et al., 2017). Augmented reality, although not commonly used, has also been tested in classrooms and aids in preparing for a future of more advanced tech interactions in classrooms by enabling teaching through various layers of virtual and real-world elements to interact in a real time nature (Sharples, 2013). Learning Management Systems are software that is used to track students' progress, record progress and aides in management and often enables other parties

such as parents to be able to track students' progress, common examples are Moodle, Canvas & Blackboard Inc (J. Bransford; A. Brown; R. R. Cocking, eds., 2000). Learning Content Management Systems are software solely for managing learning content, producing and publishing their own resources often hosted on their own Learning Management System. Aside from these other common forms of EdTech, there are E-Textbooks, Learning Analytics, Badging & Gamification, Augmented Reality (Wikipedia contributors, 2022).

### **Impact of EdTech**

If we consider the impact of technology on modern students, it has been revealed that the use of modern and innovative technology has increased the learning and activity of students' performance (Nagasubramani, 2018). With any involvement with technology, the students' interest has been greater than the traditional method of teaching and this is significantly applied in the education field. The gain of new knowledge has made it very convenient, effective and easy because students focus substantially increases when studying with technology. Not only has it impacted students, teachers have also seen some change while using it.

Technology can be used as a tool to establish meaningful projects in order to develop critical skills such as critical thinking and problem solving. The use of technology in classrooms has helped to redesign curriculum to better suit the students' learning. It has also produced an environment that promotes the development of higher order thinking skills (Kurt, 2010). In addition, collaboration amongst students can increase. This is an effective tool for learning as they are forced to work together either to create projects or learn from each other (Keser, Huseyin, & Ozdamli, 2011).

### **Educational Context**

In educational context, the incorporation of technology has the potential to increase access to education and improve its relevance and quality. The use of ICT in schools can help to communicate, create, store, and manage information (UNESCO, 2023). Further, an analysis of the report can be created using the information collected of the student. Thus, it boosted learning engagement as well as the ability to learn at one's own pace and work. In classrooms, the use of technology has enhanced teaching and learning. New technical developments such as projectors, computers, powerpoint presentations, 3D visualisation tools and mind training software computers have become great resources for teachers to teach. This can help students to learn and grasp the concepts being taught easily with a higher concentration (Nagasubramani, 2018). This is due to the fact that the visual representation of text aids to make learning enjoyable. As a result, it has resulted in greater participation because classrooms have become enjoyable and interesting (Nagasubramani, 2018).

### **Applications of Edtech**

Education learning can help in advancement such as assistive technologies will improve students with disabilities' opportunities. This would help in more participation in the classroom (Hitchcock, Meyer, Rose, & Jackson, 2002; Rose, 2001). Further, the use of technologies has greatly reduced the extensive paperwork of a student's portfolio, a document which accounts for a student's performance, and now electronic portfolios are now in use. This also provides educators the opportunity to share IDEA-mandated evidence of student progress with parents (Goldstein, 2003).

Connected classroom technology refers to a working system specifically designed to have interactive teaching and learning. The use of personal computers and handheld devices like tablets can help in making communication easier (Irving, 2006). The use of this technology allows opportunities to have improvement in formative assessments through questioning and gaining immediate feedback. There are benefits to using this type of technology. In a study, it is reported that there is an increase in skills such as vocabulary, spelling, and sentence structure by reading the work of their classmates (Lin & Yang, 2011). This gives teachers information to change instructions in order to suit the students' demands and needs (Black & Wiliam, 1998; Fuchs & Fuchs, 1986). Data logs can be created using student's performance and can be analysed later in teacher analysis. In the connected classroom, teachers can be adaptive towards the critical foundation of formative assessment practices. It provides the needed information to monitor student's incremental progress and keep on the right path to learn in depth and have conceptual understanding. The use of this technology gives a safe environment for students to learn and help understand their role being critical listeners and thinkers in the classroom (Artzt&Yaloz-Femia, 1999).

The accessibility of learning is becoming easier and easier due to modern technology. Students with disabilities can learn in their preferred program and feel be a part of regular society. The use of interactive whiteboards has allowed students to collaborate with teachers which has led to flipped classrooms. It aims to increase student engagement and learning. Further, it allows comments on a single surface so the entire class can

see and participate actively simultaneously. New devices such as amazon kindle specifically made education in mind so that thousands of eBooks are available online for users to read.

### **Appeal to Students**

The use of media such as pictures, videos and audio have a stronger appeal to students than the use of text. Thus, the implementation of visuals using projectors and visuals using personal computers through the use of technological devices has helped learning become more interesting and enjoyable for students. This use of modern technology has also motivated students. They have become more eager and curious as they are trying out something new and more likely to retain the information they have collected. According to Millar (2013), she said “technology is, like giving each student their own smartboard”. This shows students are able to show what they know while the teacher can become comfortable while teaching is occurring. As a result, students' ability and likeness of level of interaction with the teacher increases. The gaining interest would enhance further motivation. The use of technology allows all students the opportunity to participate, “It's hard to be honest when you have to put your hand up in front of the room”. Students feel confident in themselves while gaining knowledge and using technology as an advantage to complete tasks. Likewise, in regards to technology, the learning process becomes easier as students are able to think for themselves as they are not opposed to reading just text. Teachers in top universities and schools do not hand out papers or notes and use the software PowerPoint presentations. It is linked to an increase in attention of students during lesson time. Not only does it save paper leading to lower levels of deforestation, students' learning is enhanced as well. It has become so convenient for students as they can access notes the lecturer gave on their mobile phones. This has led to lower weight being carried in their bags as they do not need to carry their books everywhere they go and gives the ability for the student to learn at his own pace. This is because students can learn in their own free and preferred time.

### **Traditional Classrooms**

In traditional classrooms, teachers would collect student work, would evaluate it and return it back to the students a few days later. Several cases have shown students have forgotten the point of the assignments and teachers frequently experience difficulty in correcting conceptual problems after teaching the topic as they need to go ahead with the syllabus. With the pace of instructions being unchanging, students would face a tougher problem as limited understanding would lead to accumulation of doubts impairing the ability of student's achievement. Especially in science and math related subjects, delaying feedback is damaging to learning because conceptions build incrementally. The use of connected classrooms allows students to see the results shortly after submitting their individual work. By integrating technology, displays can give clues and further learning into doing, thinking, and understanding (Roschelle, Penuel, & Abrahamson, 2004). With this new information, teachers can use it to adjust instruction. A teacher can choose to view the aggregate class results to display the non-threatening and immediate private feedback in order to encourage reflections of results and classroom discourse (Abrahamson, Davidian, & Lippai, 2002; Dufresne, Gerace, Leonard, Mestre, & Wenk, 1996). Assignments assigned to students can be modified; for example, requesting to answer a specific question, writing an equation, reasoning based questions, simulations, group participations and problem solving (Stroup et al., 2002; Wilensky & Stroup, 2000, 2002).

According to AdvancED's report (Sumedha Chauhan, 2017), students do not purposefully use classroom technology implemented even though it is well equipped. This may be due to a number of factors including teacher's preparation for classes and training in use of modern technology, effect of technology in school culture. Moreover, the concerns of availability of technology at home could increase inequalities in education as students come from various socio-economic backgrounds (Broekhuizen, 2016).

### **Negative Effects**

Even though technology is considered to be valuable in education, it too has some negative effect on education and learning in classrooms. In a study conducted by Sülzenbrück, et al. (2011) that investigated the effect of computer use on motor skills, it was discovered the use of modern and innovative technology affects changes in basic psychomotor and cognitive skills. This includes tools such as computers, electronic organisers, and navigation systems. This is a serious concern in the learning of students. It has shown that modern students are not able to carry out tasks that were done a decade ago as they have become more reliant on technology (Rajendran, 2023). Newer technology includes robots, videos, virtual classrooms which have augmented reality. Not only has it increased interest of students but also has helped in making more developed and effective practices which has fostered cooperation and intellectual curiosity amongst students. This can help teachers to gather more data and information about their student's performance.

### **Physiological Effects**

As technology in education is becoming more prominent, advancements in technology are rising and this has led to some drawbacks. Even if technology leads to increased motivation and concentration, teachers feel it is hard to gain student's attention usually as they play online or video games during lessons (Cheung & Ng, 2021). This has led to inadequate time spent on focusing on their studies at home. This is a serious concern for teachers as they worry students may become addicted resulting in a poor academic performance, extracurricular activities and sometimes in sports. Additionally, teachers need to relearn how to use such new innovative technology and how it can be incorporated in classrooms. Gressard and Loyd (1985) found their personal interest is key to such technology to have successful implementation. Some teachers do not have positive attitudes towards computers and their poor attitudes have led to a failure of the computer-based projects.

### **Physical Health Effects**

Physical health and technology are like opposite poles to each other. Researchers have questioned whether technology does or does not have a place in physical education classrooms. It is argued that technology is positively helping student's learning into physical and active lifestyles. According to Hanski (2016), the use of technology is aiding students' physical experience. It is shown that their sedentary lifestyles turn into physically active and fit lifestyles. On the other hand, it can be argued since Gard (2015) stated his concern of the use of digital technology in physical education and its marginalisation of physical education teachers' roles. As technology increases so do the health issues associated with it. Moreover, the argument for medical problems faced such as headaches, eyesight problems and back pain is laptop screen or mobile phones. While working, many people look into electric devices for hours without blinking or taking the required break in order to rest their eyes. Problems of hearing impairment can be seen through the usage of earphones for longer periods which can result in a problem in the long run.

Social skills of students have been impacted through the use of technology implemented in classrooms. Even though the internet is becoming widespread, communications have become easier and much more immediate. This is due to the fact that information access is immediate with no delay. Yet, the key skills of developing social skills from a younger age are greatly affected. Face to face interaction has become limited as networking apps such as social media has brought the entire world to replace real life communication. This has resulted in isolation and social rejection (Rajendran, 2023). In the fast developing world of digital communication, students feel a loss of confidence, sense of emotion or empathy for others, and absence of personal connection. This is due to lack of eye contact, voice tones, and facial expressions which enhances connection with others.

### **Integrating EdTech**

EdTech is as diverse as the field of technology itself. The first question often needed to be asked is what are the barriers to entry for schools into EdTech. A research done looking at 123 different reasons noted that 40% of the barriers into EdTech was the lack of resources (Hew & Brush, 2007). To put it simply, not all schools have such fees that put them in a position of being able to afford devices capable of using EdTech solutions. Even if tech is abundant, not all schools are able to have adequate teacher training and provide support for the tech being used (Higgs & Farby, 1997). In EdTech it is widely acknowledged that a 1:1 computer is best suited for learning but in most situations as it means more hands-on time with learning for each student, however in many cases the number is often only narrowed down to 1:1.7 (Bebel & Kay, 2010). Most of the benefits from EdTech come from this 1:1 interaction and without it there is minimal promise to have the transform of instructional methods that teachers are hoping for if only a few of their students are able to have access to digital devices at a time (Grey, Thomas, Lewis, 2010). Although EdTech has great promise in teaching there seems to be a lack of research done in the efficacy and ease of learning of EdTech solutions, decision makers implement technologies with minimal evidence on what is likely to work with their schools. Billions of dollars is spent of infrastructure and EdTech that is under or ineffectively used because of that lack of information (Edtech Evidence Exchange, 2020).

### **EdTech in India**

Edtech is also a solution proposed to improve the quality of teaching being provided to students, with more recent trends being towards models of teaching with are adaptive and can be personalized, being more "student centered" (Johnson, Adams Becker, Estrada, & Freeman, 2015). The field of teaching in India itself has been facing several issues such as the teacher shortage (UNESCO Office in New Delhi, 2021). Such models of adaptive learning may be able to help tackle issues such as lack of teacher training (Batra, 2005) & motivation (Ramachandran, Pal, Jain, Shekhar, & Sharma, 2005). The K-12 space in India has seen heavy investments from philanthropic organizations, startups and also private equity (University of Pennsylvania, 2016). Some notable

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examples being BUJY'S, Vedantu, Unacademy and Toppr. EdTech is being considered for adoption by some state governments in India to hopefully address such equity, access and quality concerns in schools (Government of India [GoI], 2013, 2016a; NCERT, 2006).

### **Survey Methodology and Rationale**

In our endeavor to investigate student perspectives on the integration of Educational Technology (EdTech) within educational settings, we meticulously adopted survey research methodology. The selection of this research methodology was anchored in its suitability for our research objectives, reinforced by established scholarly work, and fortified by pragmatic considerations associated with our study.

### **Survey Research**

Survey research, as characterized by Dillman, Smyth, and Christian (2014), is a systematic approach for collecting data from a pre-selected sample of individuals through the administration of standardized questions. Our research design encompasses the following critical components:

1. Google Form Questionnaire: We judiciously opted for Google Forms, an online survey platform, as the medium for our data collection. This choice emanated from several compelling rationales. Google Forms, known for its user-friendliness, has been acclaimed for its accessibility to a diverse range of respondents (Rezaei et al., 2018). Furthermore, it offers streamlined mechanisms for data management and analysis, essential requirements for our study (Williams & Vogt, 2019).

### **Reasons for Choosing the Survey Method:**

- a. Effectiveness in Capturing Opinions: Surveys have been unequivocally demonstrated to be highly effective in capturing opinions, attitudes, and perceptions (Dillman et al., 2014). Given our research goal to discern student perspectives on EdTech, the survey methodology provided a systematic and standardized means of collecting such data.
- b. Diversity of Participant Demographics: Our research mandated data collection from a broad and heterogeneous array of students, spanning diverse educational institutions and geographical locations. Empirical studies underscore the adaptability and scalability of surveys in accommodating a diverse and expansive audience (Schonlau et al., 2009).
- c. Quantitative Data Acquisition: Empirical literature asserts the capacity of surveys to yield quantitative data, facilitating subsequent statistical analyses (Dillman et al., 2014). This attribute was indispensable in garnering meaningful insights and identifying discernible trends in students' opinions concerning EdTech.
- d. Time Efficiency: Time constraints were a prominent determinant in our research project. Surveys, as substantiated by previous research, are renowned for their efficiency in data acquisition, enabling data collection from a substantial number of participants within a defined timeframe (Dillman et al., 2014; Rezaei et al., 2018).
- e. Resource Management: Given resource constraints, surveys emerge as a cost-effective alternative compared to certain other data collection methods (Williams & Vogt, 2019). This aspect permitted us to conduct our research without incurring prohibitive costs related to data collection.

### **Sampling Method**

Convenience sampling, elucidated by Etikan, Musa, and Alkassim (2016), and substantiated by various scholarly works, is a non-probability sampling technique based on the selection of participants due to their accessibility and willingness to participate in the study. Herein are the rationale and considerations underpinning our adoption of convenience sampling:

### **Reasons for Choosing Convenience Sampling:**

- a. Pragmatism: Pragmatic considerations prompted by temporal and logistical constraints rendered convenience sampling a judicious choice. It enabled us to promptly identify participants based on their availability, thus enhancing the feasibility of the research process (Etikan et al., 2016).
- b. Geographic Heterogeneity: Recognizing the absence of geographical constraints within the domain of EdTech, our research aimed to encompass the perspectives of students residing in diverse geographic regions. The combination of convenience sampling with an online survey platform facilitated engagement with students from disparate geographic locales (Etikan et al., 2016).
- c. Efficiency: The inherent efficiency of convenience sampling expedited the data collection process, a fundamental requirement for achieving our research objectives within the stipulated timeline (Etikan et al., 2016).

- d. Cost-Effectiveness: Confronted with financial constraints, the adoption of convenience sampling served as a pragmatic means to mitigate the intricacies and fiscal encumbrances associated with more intricate sampling methodologies, including stratified or random sampling (Etikan et al., 2016).

We chose Google Forms as our primary data collection tool due to its notable advantages including enhanced accuracy, streamlined data entry and data categorization. Along with this the platform also allows for immediate feedback on survey results, eliminating the need for manual data collection and processing. The main advantage of forms is that it enabled us to access several schools across various locations and analyze the data with more efficiency. (Topp & Pawloski; 2002)

Potential drawbacks of online forms were considered. One often notable disadvantage of an online platform is that it has the prerequisite of needing to know how to interact with and utilize online platforms efficiently. However, it is worth noting that our target platform primarily consisted of educational institutions (schools) that actively integrate edtech into their routines; thus, the impact of this concern is minimal. (Kongsved, Basanov, Holm-Christensen, & Hjollund; 2007)

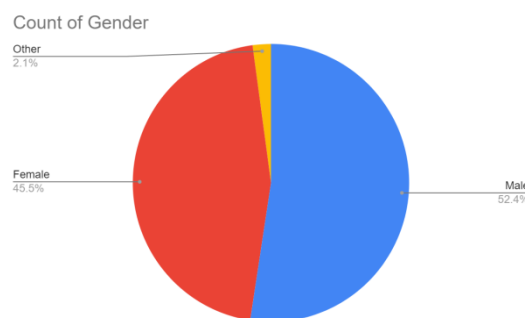
### Quantitative

We choose quantitative questions because they are designed to elicit objective responses. Participants are presented with predetermined response options or asked to provide numerical ratings, reducing the potential for ambiguity or subjective interpretation. This objectivity enhances the reliability of the data.

Closed-ended questions are those in which the responder must select one of a predetermined number of answers. Closed-ended questions are useful when you want to get precise data, confirm existing knowledge, or make decisions based on facts. (Shukla M, 2023)

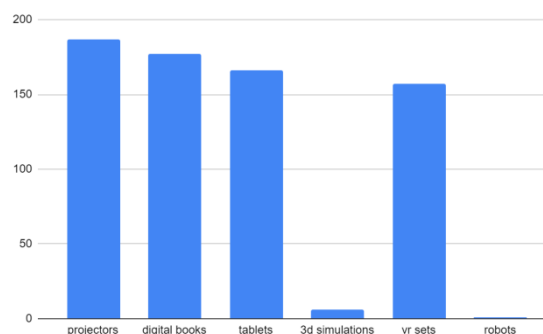
### Gender

This question enables profiling demographics to categorize survey respondents into different groups and allows us to understand gender differences better.



### What kind of edtech is being used?

One of the primary objectives is to quantify the extent to which different forms of edtech are utilized in teaching. By asking respondents to specify the types of edtech in use, researchers can obtain a clear and structured breakdown of the technologies being employed. This quantification is valuable for understanding the prevalence and distribution of various edtech tools within the educational context.



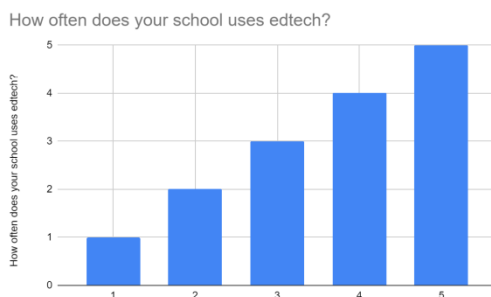
Projectors were the most used edtech, likely due to their versatility and cost-effectiveness. They are easy to set up, compatible with various devices and teaching methods, and enhance engagement by displaying visual content. Teachers often find them valuable alongside traditional teaching methods.

Digital books are the second most common tech due to how they can easily be accessed on any computing device from laptops, pcs tablets and phones and allow for a more cost-effective distribution of materials.

Tablets were ranked 3rd implemented likely due to the ease of portability and how they can enable access to many forms of digital content like books and videos

### How often does your school use edtech

By employing a numerical scale to gauge the frequency of edtech usage, researchers can quantitatively measure the extent to which technology is integrated into classroom activities. This quantification is crucial for understanding the prevalence and depth of edtech integration in educational settings.

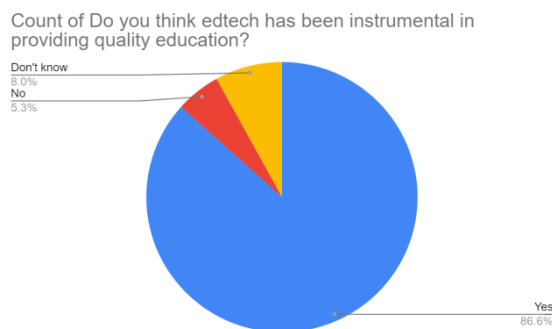


Most responses rated the use of edtech in classrooms as 5 meaning that a majority of their time is spent using tech in classes.

There were a decreasing number of responses for each lower rating, suggesting that private schools that have implemented edtech also prefer to use them in classrooms as often as possible

### Do you think edtech has been instrumental in providing quality education

Using a simple binary response format (yes/no) makes it easy to quantify students' opinions without the need for extensive qualitative data analysis. This allows for a quick overview of the general sentiment regarding edtech among the surveyed students.



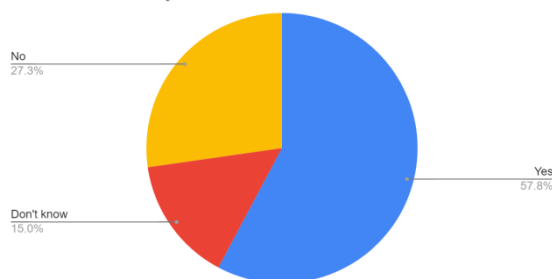
Most students believe that tech is a vital part of education in contemporary society with 86.6% respondents agreeing, our qualitative data analysis on the same question goes into more depth about what improvements students have found with the implementation of edtech. (*How do you think edtech has impacted schools?*)

### Do you think edtech can help in creating access for education for everyone

The question aims to gauge how individuals view edtech as a means to expand access to education. It assesses whether respondents believe that technology can serve as a tool for making education more accessible to a wider range of learners.



Count of Do you think edtech can help in creating access for education for every child in India?



Majority of students (57.8%) seem to believe that edtech is helpful in creating opportunities for all children regardless of income background. However a fair bit of students (27.3%) feel that it is not helpful for every child.

### Do you think edtech is the future of education?

Respondents are given the ability to respond in their own way without being limited by predetermined answer possibilities when given an open-ended inquiry. Open-ended questions are useful when you want to explore new ideas, gain deeper insight, or generate hypotheses for further research.(Shukla M, 2023)

Thematic content analysis was employed in this study, with a focus on descriptive coding for data analysis. During the coding process, responses were systematically examined to identify recurring patterns, and these patterns were used to develop themes and categories that directly aligned with the research objectives (Creswell, 2012). Subsequently, units of meaning in the form of specific words and phrases were singled out. Following the initial round of coding, a higher level of abstraction was achieved by identifying overarching themes that encompassed common elements across the data.

Our coded data was also member checked by 5 randomly selected respondents that verified that it was reflective of their opinions.

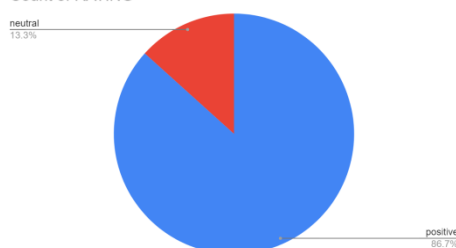
### How do you think edtech has impacted schools?

This question seeks to understand how people perceive the influence of edtech on schools. It aims to gauge whether individuals have had a positive or negative impact. Using a qualitative method also allows us to gain insight into the specific ways that students believe schools have been impacted.

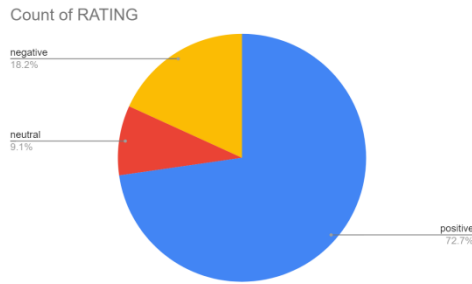
Students may have unique experiences with edtech. This question allows individuals to share their personal experiences and observations, shedding light on how technology affects teaching, learning, and overall school dynamics. Along with helping our understanding the perceived impact of edtech helps educators and institutions anticipate future needs, whether in terms of infrastructure, professional development, or policy adjustments.

Responses can be coded as positive, neutral or negative by using keywords that show the overarching opinion of the student responses. These positive and negative responses can then be classified into specific impacts that were mentioned such as “improved learning outcome”, and “improved access to resources”.

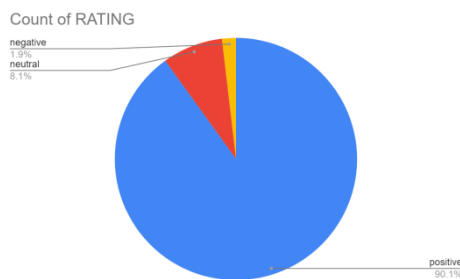
Count of RATING



86.7% of people who responded don't know to the impact were coded for saying positive things about the implementation of edtech While 13.3% was neutral which is way larger from other demographics



Surprisingly a majority of people who said that they though edtech did not have an impact in schools responded positively in their qualitative responses, while there still a larger number of negative responses. However, this data could be skewed due to the few number of respondents saying no to the quantitative question.

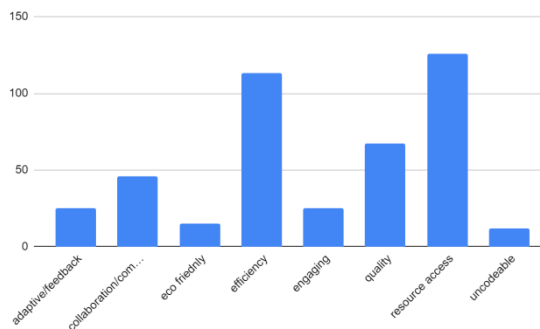


With people who responded with yes about the impact of edtech in schools, 90.1% of them had positive qualitative responses with the rest being neutral, only 1.9% had any negative opinions.

**What are the few advantages of edtech?**

This question aims to identify and emphasize the primary benefits of using edtech in education and allows students to elaborate on all the changes that they have found useful.

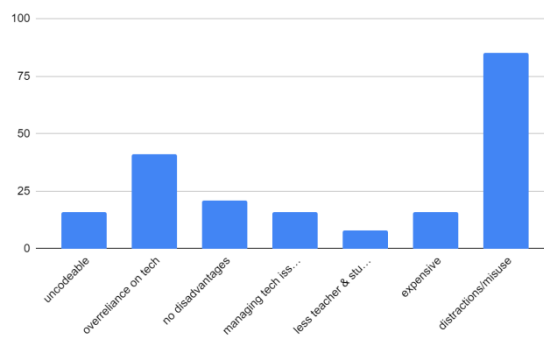
Responses can be coded into general areas of learning which have been improved such as “learning speed”, “resources access”, “learning quality”



Majority of students responded with feeling that tech helped improve the ‘efficiency’ of lessons and enabled them to have better ‘resource access’ to supplement their learning within the classroom and even in their own time. Most other benefits had similar weighting with a notable peak in the improvement of quality of education with tech.

**What are the few disadvantages of edtech?**

This question enables us to better understand the limitations and specific negative impacts regardless of whether students believed that edtech had an overall positive impact or not. It allows for a comprehensive assessment of the overall effectiveness of edtech.



Students identified distractions as the primary drawback of edtech, followed by overreliance, albeit with a significant disparity in concern levels. Additionally, the study revealed that students generally lacked sufficient information about the effects of edtech on their health and overall well-being.

### Conclusion

In conclusion, the study employed a combination of quantitative and qualitative data collection methods to gain a comprehensive understanding of students' perceptions regarding educational technology (edtech). We chose quantitative questions to ensure objectivity in responses, allowing for precise data collection and reliable results. Closed-ended questions, particularly those related to demographics like gender and school type, helped categorize respondents into different groups for analysis.

We found that private schools were more prevalent in our sample, potentially due to their greater access to resources and ability to support edtech implementation. Among the various edtech tools, projectors were the most commonly used, likely because of their versatility and cost-effectiveness. Digital books and tablets also found significant use due to their accessibility and ability to distribute content efficiently.

The frequency of edtech use in schools varied, with a majority of respondents indicating a high level of integration in their classrooms. Students generally believed that edtech played a vital role in providing quality education and expanding access to learning opportunities. However, a notable percentage expressed concerns about its effectiveness for every child.

Qualitative data analysis allowed us to delve deeper into students' opinions about the impact, advantages, and disadvantages of edtech. It revealed that distractions were the primary drawback of edtech, with overreliance being a secondary concern. Moreover, students appeared to lack information about the effects of edtech on their health.

In summary, the study provided valuable insights into how students perceive edtech, its advantages, disadvantages, and overall impact on education. These findings can inform educators, institutions, and policymakers in making informed decisions regarding the integration and use of technology in educational settings.

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