Chapter Six

Students psychology towards the technological changes in the education sector

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Abstract

Over the past few centuries, the emergence of modern technologies has drastically changed our world. There are transformations and changes in the means of communication, customs, culture, and even the inter-personal relationships of human beings. Education is one of the most important institutional processes that have been highly influenced by the inception of technological advancements. Although it has positively impacted humans in a great deal, there are large amounts of unfortunate consequences that are to be least considered, and mental health is one of these subjects that is highly ignored by most. We focus here on how technological advancements in education systems affect the mental health of students. The intent is to provide awareness about the neglected consequences of technology.

Keywords: Inter-personal relationship, Cognition, online learning, Technological advancements, Education sector, Psychological impacts.

Introduction

In the present scenario, our eyeballs are rolling intentionally more than the eyeballs of stock market brokers. It means that developing technology has taken over into every corner of our life unknowingly by surfing the internet, using gadgets, tablets, smartphones and computers had a great impact on our body and mind (Rowan, 2017; Cowie, 2013). Compared with fifty years ago, we capture three times more information in our daily life. Statistics highlight that people are spending an average of twelve hours in front of computers, mobile phones and others (Chou, 2005). Despite what we all know, techno tailings are bad for us mentally and physically.

Multitasking is common and normal, and however people feel like they are more competent, but the studies show it has the opposite effect. It is very difficult for multitasking personalities to filter irrelevant information when they are concentrating on one task at a time. Spending much more time with technological gadgets will reduce our life period even if you are cycling, swimming and jogging one hour per day (Haughton, 2015). The detailed experimentation confirms that the women who remained stuck to their seats over six hours a day were 37% more likely to lose their life during the time period studied than persons who sat less than three hours per day (Amichai-Hamburger, 2003). Technology permits the peoples to attach without the restrictions of geography, it makes the activities more competent and it supplements the effectiveness and intelligence of our brain. However, it's terribly vital variability of identical positive features, the public as a whole usually doesn't contemplate it conjointly has negative attributes as well. Youth are significantly prone to these probable negative effects like emotional instability, deteriorating memory, ineffective eyesight, hearing issues, joint and muscular pain and Heart problems (Kautiainen, 2005).

During this era, self-motivated youths are trying to earn much to become financially self esteemed with the guidelines and necessary certifications supplied by pinnacle organizations (Halupa, 2020). Variety of techniques and guidelines are tainted in the information superhighway to achieve the target (Mitchell, 2011). For example, ambitious youths are getting attraction from all over the world through hyperspace by showing their skills, photography, blog writing, cooking, artwork and plenty of other significant activities (Vagg, 2020). Developing technology provides a platform to serve humans leisure as a stress reliever by performing through Youtube and other social media (Mitchell, 2011). The Internet is one of the major resources wherein things go viral with the speed of light (Hammoglu, 2018). Ultimately, the focus of every budding technology is to practice it constructively and not for the negative activities. Though the lifetime is short, energetic and enthusiastic youths are attempting to learn new things as much as possible in the existence period. Prominent apps like Amazon, Zomato and Ola Caps are making our lifestyles easy. They have made our life a whole lot less difficult than earlier than it was. vocal exchange of money has become smooth among all. Developing communication devices are made easier to connect others around the world. All these technological developments are coined by young minds. Even then, they are the resource of our present and future. Significant care and continuous guidelines are needed for the young minds to overcome the opposite effects. However, our lifestyles are in a series form or alternative form, all the living things are connected to each other in the life cycle. Frequent effects have been observed when the people are wrong. This will trigger a respectable life in

the meantime if anybody acts truthfully, which stimulates others in a right way. Right utilization of technology leads the people in a correct way (Siddhpura, 2020). With the intention of moving towards a valuable and productive lifespan, technology should be utilized in an appropriate way. “One machine can do the work of fifty ordinary men. No machine can do the work of one extraordinary man. - Elbert Hubbard".

Despite the mentioned advantages, mobile conversation influences humans in a bad way in terms of being sociable and making face-to-face contact. Human relations and communication have drastically decreased in the mobile communication era. There’s much less non-public time, in which you locate which you don't have enough time for yourself because you’re continually in touch with a person. Similarly, it leads to distracting us from our regular activities. There may be additional loss of privacy, because all and sundry can discover you anywhere, at any time of the day. In the end, all these items impact how humans act today. Without technological advancements, our way of lifestyles would no longer be as complicated. Technological impacts form the way human beings act these days.

In this aspect, we will see how technological advancements in the educational sector affects the psychology of students. Psychology is defined as “the study of behavior” ‘which refers to any observable action of a body; that includes all the motor activities, affective activities, and cognitive activities. It does not just cover the overt behavior but also includes covert behavior considering an individual’s inner experiences, mental processes, subconscious, and unconsciousness.

Education and Technology

Education is a kind of process that takes part in every aspect of human life in various manners for leading a good meaningful life. It means the act of teaching or training (Rao, 2014). In the education sectors, over the past 19th century, the teacher will provide knowledge to the students through blackboard by referring to some standard textbooks. In this case, the teacher will act as an instructor, and students will become a listener, which is almost a one-way communication. Then, students feel very difficult while preparing for the exams because they don’t have a clear idea about the content to learn, and they miss out on information in their absence (Johan, 2014).

In the present 21st century, Technology plays an inevitable role in the education sector which makes the students interactive, forceful and retains concepts better. In this COVID-19 pandemic situation, the use of ICT tools by the teacher has become an essential one by PowerPoint presentation, 3D visualization tools, and computers integrated with softwares, digital cameras and digital boards. It enhances the students' learning ability, to participate more among the classroom and be more interesting (Raja, 2018). This chapter aims to focus about the psychological effects of four divisive technologies in the present scenario for the following education sectors:

- Virtual reality
- Artificial Intelligence and Machine Learning
- Social Media
- Biometrics

Virtual reality

Virtual reality (VR) is a computer-generated environment that gives a realistic experience on various subjects for the users. It creates an artificial environment that is well detailed, designed, and structured to provide a convincing naturalistic vision. VR has now entered the educational sector and has become an exciting learning method for students. Its feature of viewing things in 3-dimension has enhanced the understanding skills of the students. It also allows students to view from all angles providing a complete 360-degree view; this delivers a realistic experience.

Virtual field trips

There are many examples of VR applications in the education process. For instance, virtual field trips allow students to visit and explore various destinations such as museums, research centres, monuments, and even space virtually. It helps in improving geographical, historical, and astronomical knowledge for the learners.

Virtual labs

The virtual laboratory is a computer-based research program where learners can view experiments, interact with experimental apparatus, and conduct new research through a digital platform. This is becoming a great substitute for real-physical laboratories.

Telerobotics

Telerobotics enable learners to control a robot from any distance with virtual reality as an inclusive feature. Students can experience being wherever the robot is and can see and perceive everything live in a first-person view. In the field of education, telerobotics play an interesting role, it enables the students to witness live surgeries, visit research centres, and interact with researchers and professors.

Psychological perspective of virtual reality (VR)

With so many advantages, Virtual Reality has become a new essential innovation. Its main goal is to deeply immerse the users into a whole new world. It is designed carefully to keep the users engaged in it. In the book, Understanding Virtual Reality, Interface, Application, and Design (Sherman & Craig, 2003) has mentioned 4 key features of Virtual Reality. First, virtual reality uses an imaginary space which exists independently from the real environment, this space is made using computer graphics and visual elements. Second, when the users in the virtual space they are completely cut out from the real world on a sensory level by the usage of sounds fully immersing the users into the virtual world. Third, VR uses a sensory feedback feature that tracks the head movements of the users so that the program changes its directions accordingly giving an illusion that they are moving around in the virtual world. Lastly, VR interacts with the users using virtual elements, for example picking up an apple or pressing a button. These key features of Virtual Reality engage the students in the virtual world on an emotional level which provides a realistic experience.

Baños et al. (2006) and Riva et al. (2017) states that VR induces moods in the users. These 'moods' include positive emotions such as interest, attentiveness, and a feeling of presence and it also includes negative emotions such as anger and fear. Riva et al. (2017) found that the feeling of "presence" that is felt while in the virtual world is the main reason to make VR feel realistic. This type of engagement deeply roots the information in the students. Canli et al. (2000) experimented on 'Event-related activation in the human amygdala associated with later memory for individual emotional experience'. Their aim was to show that emotive imagery will be remembered better than those that triggered little emotion, they studied whether amygdala was sensitive to varying degrees of emotion and whether the activation of amygdala enhances the memory. As they aimed, the experiment proved that amygdala activation increases while viewing emotive imagery and that it creates a longer lasting memory. In relation to this psychological experiment, we can say that experiencing virtual reality, triggers the emotions with its vivid, well defined and realistic imagery and so it increases the activation of amygdala; therefore, enhancing the memory of the experience. From this we can conclude that using VR in education will help the students remember the information for a long period.

It is very essential to know both the positive and negative sides of Virtual reality, it is stated that using VR can cause some physiological problems such as nausea or dizziness (Regan 1995; Akiduki et al., 2003) and eye fatigue (Cao et al., 2019). However, there is little information about the negative psychological effects of VR. Slater et al. (2006) states that VR has an ability to evoke negative emotions as it can stimulate emotional arousals that are close to reality. Since VR is very much identical to real life, any negative emotion caused during a virtual reality program will be intensified. It is also reported that VR reduces cognitive performance. Virtual laboratories for example, interact with the students by allowing them to control the computer program. Even though VR is close to reality, it is not real.So, it is less likely for the students to understand how the concepts can be applied in real life. It can be easy to watch an experiment virtually but doing an experiment in person is the real task. When students start to learn a concept using VR by just watching computerized programs, it will reduce their performance skills, thinking skills and problem-solving skills on that particular concept. In the case of Virtual field trips, students are fully immersed into the virtual world being manipulated by its key features that (Sherman & Craig, 2003) mentioned. This might be an interesting way to learn but it sometimes leads to stress, anxiety and physiological effects such as fatigue and headache.

Artificial intelligence

Artificial intelligence (AI), is a machine programmed which has an artificially programmed human intelligence. This can be a robot, an app, a software, or a device. The first AI program was developed in 1955 and from then it has been a very successful invention. Today, AI is being used in various fields and is still being upgraded in many innovative ways bringing up excellent new inventions. These include many mind-blowing inventions that are very much useful in the field of education such as robotics and mobile apps.

Robotics

Robotics is a small branch of technology that studies how a robot is designed, programmed, and engineered. A robot is basically a machine (mostly a human-like figure) that is developed to perform particular tasks. Robotics combined with AI makes the AI robots which are designed in a way that it can react on its own, it senses a specific stimulus and gives an appropriate response to it. In simple words, it is a machine with intelligence. In the field of education, robotics is bringing advanced changes. Robots are being created to teach, respond, and to have effective communication with students. One day these teaching-robots may replace all human teachers.

Mobile apps

Mobile apps are software programs on a mobile device, these include communication apps, gaming apps, search engines, and social media. One category in mobile apps are educational apps, these apps consist of various courses to study, such as Udemy and Coursera. It provides enough study materials that are required for a student to understand the content. It also conducts quizzes and tests to expertise the learner in that subject. Some of these study apps (Example: Duolingo- language learning app) uses AI to understand the learner's level of skills by their input and it trains them accordingly, i.e, it can be personalized appropriate to the student's level of understanding.

Gamification

Gamification is the app that is made with tools to create a game-like program that encourages the user's engagement, learning apps also come in a "gamified" form to increase the involvement of learners (for example, the app Duolingo uses gamification techniques to help and train the learners to remember new words or phrases of a language).

Psychological perspective - Artificial intelligence (AI)

AI robot teachers can be an interesting mode of teaching for the students. They can have very effective communication with students like a normal human. However, these robots don't have human feelings, they acquire only the programmed skills. Therefore, they have limitations, a human teacher can have a personal connection with the students, they can understand the students' emotions, and can change their way of teaching in various methods. Even though AI provides personalized teaching, a robot cannot think or understand why a student is making a mistake and what problem they are facing, but a human teacher can communicate these problems to the students and resolve them. In short, if human teachers are replaced by bots, students will lack the human touch and emotional connection with the teacher. A teacher plays an essential role in a person's development, especially during the developmental stage 'early childhood' (2-6 years). Fenech (2007) states that a teacher has to fulfill two goals of a child during their early childhood. First, they must prepare the child academically, socially, physically, and emotionally for their age. Second, the teacher must foster, care, and provide security for the child in the absence of parents. Teachers do not just educate a child, they play

an important role in the child's social development and a teacher's role determines the future potential of a person. These humane roles cannot be fulfilled by a robot, so the students taught by a robot may not be well socially developed. Mobile apps on the other hand have become a comfortable mode of learning. Gamification method has made educational apps much more interesting. This makes learning easier and various subjects are just at the finger-tip. Here, there is a possibility that the students might develop a dependency on the mobile apps. This has contributed to the increase in home-schooling in the past few years. Home-schooling can be great for many students, but this may not help them develop their social personality. In some cases, it could be a cause of Antisocial personality disorder.

Social media

Social media initiates addition among the people with invariable age limits. It would become an unhealthy habit to endlessly search the data feeds of exclusive social media websites. Experts believe that inside the brain, a few roles such as 'likes' and 'shares' set off the praise center. Unknowingly, our moods are often influenced by these functions. This might be the way in which young people are more attracted towards the digital network than adults. We love our friends and relation; both are influencing how we think of ourselves as social beings. Our day today activities are fully dependent on which is based around social media, this drives a lot of our actions. Young minds attracted towards digital networks literally end up with killing of productive time by posting pictures, digital information shared and watching digital media in the websites as they track day by day. Other tasks, such as learning, regular school activities, sports, and other positive activities, conflict with this addiction.

Online classes:

As a result of COVID-19 pandemic, schools, colleges are locked up all over the world. More than 1.2 billion students are not allowed to enter the school and college premises. Education departments are urging to implement an emerging e-learning technique to overcome this issue. Teaching is carried out remotely on digital platforms to impart knowledge to the students. By means of this unexpected shift away from the regular classrooms in several regions of the earth, few people have thought that the implementation of e-learning will continue post-pandemic and what will be the impact of this shift on the global education market. The online classes are conducted in various platforms like Google meet, Microsoft teams, Zoom Meeting, Kahoot, Photomath and prezi. The acceptance of online platform study for the student's acceptance ratio lies in the range of 60-70 % for our subject as shown in Figure 1.

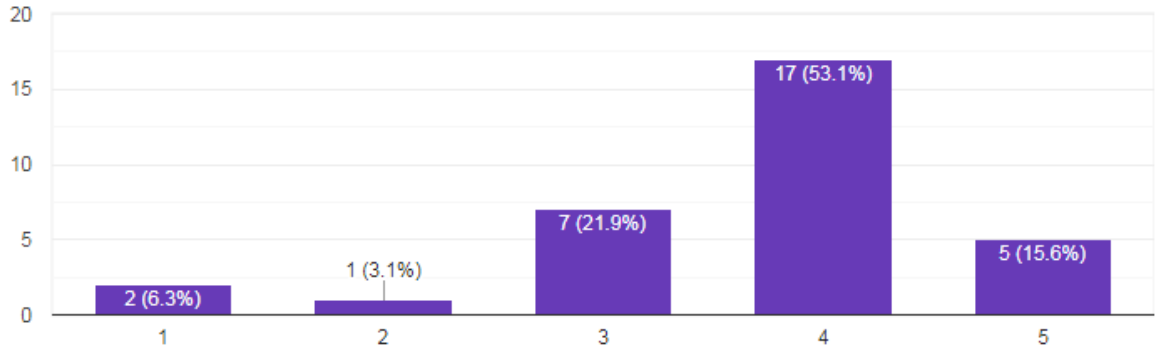

Figure 1: Students acceptance in relation to online classes

Social networking apps

The communication occurs more rapidly between two known individuals, two unknown individuals and groups of people through various social networking apps like WhatsApp, Facebook, Linkedin, Twitter, YouTube, Contentcal, Telegram and Instagram. Due to these apps the relationship among family members has an adverse effect in comparison to previous generations.

Psychological perspective – Social media

Social media has become the new sector of education now. The COVID-19 pandemic has toppled the system of education, it is completely technology based now. Students socialise a lot in schools and colleges, meeting new people and having a human touch is a very essential part of life. Online classes have cut down that opportunity and socialisation has also been vastly digitalised. This promotes sedentary behaviour rather than encouraging the students to live a physically active life. Apart from the physiological problems that come with this style of life, it also causes too many psychological problems. It is reported that physically active children have a greater body satisfaction, self-esteem, and physical self-perceptions than the ones living a sedentary life (Health Education Authority, 1998). Likewise, a positive relationship between amount of exercise and both physical and mental quality of life measures has been observed in healthy adults (Martin et al., 2009). Online classes have led to the increase in social media usage. Instagram, Facebook, Snap chat and Twitter are the main social networking apps that are most commonly used as a communication medium by the young generation today. Posts, stories, tweets and snaps can be useful to update your daily activities to friends, share your thoughts and keep in touch with everyone. Meanwhile, there is also a darker side of it. Likes and comments a feature plays a huge role in affecting mental health. The one that gets a lot of likes, views and positive comments feel positive about themselves, whereas, the one that gets least likes start to feel insecure and low about themselves. Social media has also contributed to a new psychological fear FOMO (fear of missing out).

All this elevates anxiety, stress and causes depression. It was found that forty five percent of British adults feel restlessness when they are not able to access their social networking sites (Anxiety, 2012). The Hearty Soul (2016) states that the longer you spend on social media the more depressed you are, further it also reports that social networking apps are less helpful to students in remaining more focused and less stressed. Kaur and Bashir (2015) researched both positive and negative effects of social media on mental health of adolescents, positive effects include socialization, enhanced communication, learning opportunities and access to health information. While negative aspects include depression, fatigue, stress, suppression of emotion and decline of intellectual ability. In severe cases, it might lead to disorders. Distress and anxiety caused by social media can cause Social media anxiety disorder. Lack of real-life socialization due to digitalisation might cause Anti-social personality disorder. It has also increased the number of cases of Anorexia Nervosa, this is caused by the influence of media in "beauty roles", victims of anorexia starve themselves to lose weight hoping to look beautiful. It is predicted that depression caused by social media and online classes can promote suicidal thoughts. India Today (2020) and Nath (2020) has mentioned that the rates of suicide has

increased during the COVID-19 pandemic and the major causes of the suicide of young students is stress and depression created by long screen-time during online classes. Humans are social animals; they require socialisation in order to survive a normal healthy life. Umberson and Montez (2010) believes that quality and quantity of social relationships affect behavior, physical health, mental health and mortality risk. The longer a person spends their time on gadgets the less socialised they become. Depression is associated with negative social interactions and social isolation (Schuster et al., 1990; Chou et al., 2011) and suicide (Holmaetal., 2010). It is evident that this causes a decline of proper mental health.

Biometrics

The word ‘‘biometrics’’ derives from the Greek words Bio (life) and metron (measure). It is basically a security-based application that authenticates using biological data like fingerprint, iris, and face. Nowadays this biometrics system is used in educational sectors to enhance the security and to count the attendance of a student. These sectors often use fingerprint or Identity Card data authentication, when a student enters the building by authentication, their attendance is also automatically calculated.

Psychological perspective

As biometrics is a technological advancement in educational sectors, it might create an ambience of being a “high-tech” environment. It provokes a feeling of being in a formal artificial setting. Hence, the faculty there may be considered as a higher authoritarian person than in other educational sectors. Milgram (1963) in his study of ‘Obedience’ found that people are more obedient to an authoritarian person and that obedience could even harm a person. Now, in relation to this study, we can predict that students tend to be more obedient in a formal setting especially while being in a highly secure environment. This obedience could result in active participation and increased attendance of a student.

Table 1: Technology vs Psychological effects

Technology	**Psychological effects**
Virtual reality	● Amygdala activation Increases which creates long lasting memory. ● It creates interest and attentiveness ● Anger and fear
Artificial Intelligence	● Lack of live interaction with real teachers. ● Home schooling increases that leads to loneliness.

Social media	• Promotes sedentary behaviour • FOMO (Fear of missing out) • Emotionalism • Depression ,stress, Loneliness and anxiety • Social media anxiety disorder. • Anti -social personality disorder. • Anorexia nervosa • Increase in suicide rates. • Decline in mental health
Biometrics	• Relation to obedience.

Conclusion

The four divisive technologies in the education sectors concerning the psychological effects are summarized in relation to the current research. Technology always provides better value to the education; in addition to it the better teaching material, teacher student interpersonal relationship, free from social media addiction will enhance the learner's experience. The education sector, particularly institutions should increase the level of learning and to bridge the gap between the institution and industry which is to be considered in relation to industry 4.0.

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