Interdisciplinary Term Paper

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The interdisciplinary writing process is a complex and intricate process that critically evaluates and dissects a topic using multiple different disciplines. In this paper, I will be using Psychology, Sociology, and Engineering to evaluate my topic. Psychology is the study of human behavior and how or why we do what we do. Sociology is the study of human interaction and the extent to which we engage with one another. Engineering is the study of how objects or constructs work and the intricacies that make them tick. My paper will reference these disciplines to answer the question: What are the effects of digital technology usage on adolescents and their future?

The first discipline I will be evaluating is Psychology which is the most common one when mentioning the topic of digital technology. There are numerous conflicting views on the matter as the world has become more technologically dependent than ever and every individual has some sort of technology that is a constant in their daily lives. Whether it is for convenience or pleasure, it is commonly there for ease and availability which can create creative outlets or mental barriers. The psychological effects of digital technology, like the effects of many situations, can be concluded as neither inherently right or wrong as it has just as many possible benefits as it does deficits.

The positive effects of digital technology on adolescents would be ones that lead to social interaction, higher motivation to do things, and the ability to freely express oneself to any and all audiences. This is primarily due to the introduction and creation of social media which allows for endless and easy ways to connect and express openly to the public. According to Keveri Subrahmanyam, social media and its communication tools create a way to “reinforce existing relationships.” They then further their point by saying that, “online interactions with strangers… may have benefits, such as relieving social anxiety (Subrahmanyam 2008).” These assertions

give way to the positives that may come from digital technology use as it can help foster a new way to encounter with various people in the world giving way to relationships beyond a normal scale of a person's day to day life. One more point given by Subrahmanyam is that, "Electronic communication may also be reinforcing peer communication." This is evident in today's world as it is often seen that people will connect with peers far and wide to encourage and talk to one another which once again gives way to the positive communication aspect of digital technology usage.

Negative effects of digital technology would include reasons equivalent to decreased mental well-being and dependencies. This is primarily found in excessive use of digital media and activities such as excessive video game playing or distraction posed by social media. A study done by Jean Twenge found that "After 1 h/day of use, more hours of daily screen time were associated with lower psychological well-being." Twenge then gave details of the potential drawbacks saying that symptoms could include "less curiosity, lower self-control, more distractibility, more difficulty making friends, less emotional stability, being more difficult to care for, and inability to finish tasks." These are very detrimental drawbacks as they not only affect how, in this case the adolescent population, can produce in class and in the world as a whole. As the article continues it is concluded that four hours of use a day would lower psychological well-being (Twenge 2018). While this may seem overly critical of technology, it must be acknowledged that the article does not explicitly say what is on the screens causing the issues. For example, if an individual is just on their laptop doing an assignment, it does not automatically mean one should be concerned for their well-being.

Sociology is the second discipline that I will be evaluating as it has been the most affected by the advancements in technology. The world has seen unparalleled growth in the way

culture and social structures are created and maintained due to the emergence of technology. There are now events that are strictly run through technology and its products rather than social gathering or in-person meetings. There can be positives drawn from these advancements, however, they have paved the way for new dimensions of social communication. Then there are negatives that have seemingly put socializing in the background to other technological activities and uses.

The sociological approach to the argument and its positives can be seen as easy to revolutionize how we as humans connect and interact with one another. In a study done by Eugenia Ives, she found that a positive in the sociological aspect of technology use is how it can enhance "youth's ability to create content." They then go further to say that it "has the potential capacity to bridge the educational gap that exists between social economic demographics (Ives 2013)." This helps suggest that the sociological structure of the adolescent community is in a place that can be sustained and grown upon in an education stance to facilitate positive change. The article by Ives goes on to say that, "Digital technology is creating a new digital literacy and connects learners to content with information and media available on the Internet." With these opportunities present it delves into the world's socioeconomic structure as technology creates a common ground for all learners regardless of economic or social status.

Digital technology and its negative effects on Sociology can range from limited social interaction and reliance on nonverbal or means other than in person communication. It could be extremely detrimental to usual processes like completing a discussion board or completing laundry. More importantly, it can also cause interactions between people to be rushed or missed due to procrastination. A study done by Dienlin and Johannes found that "procrastination and passive use are related to more negative effects." They then went on to state that, "social media

increase the risks of (i) bullying; (ii) neglecting face-to-face contacts; (iii) obtaining unrealistic impressions of other people's lives (Dienlin 2020)." With these reasons present one can argue that there is an obvious negative association with how technology can influence the perception of the world and its people which in turn affect social interactions and an individual's willingness to do so. The researchers concluded that "already existing problems increase maladapted technology use, which then decreases life satisfaction (Dienlin 2020)." With this in mind, it can be suggested that the world of technology can amplify negative feelings, which in turn, create less interaction or care for the outside world and the various social interactions it may present to oneself.

Engineering is the final discipline that I will be evaluating in my paper which is where digital technology and every advancement there has been stems from. The use and creation of engineering has created an infinite amount of possibilities for creation and production for the technological world as the advancements and leaps in power, precision, and efficiency grow day by day. The creation of the Internet of Things, Artificial Intelligence, and Big Data Analytics have contributed to the development of several world altering changes that have fostered new eras and ideas from all over. This constantly evolving field has caused a new emergence and lifestyle for adolescents that will be felt forever.

Within the engineering discipline, there are several benefits due to the consistently growing nature of the discipline and its seemingly new discoveries every day. One advancement in particular would be Artificial Intelligence which has taken the world by storm as it seems to have an answer to virtually anything and it completely changes the game for problem solving. An article by Bughin et al. headlines their excerpt by stating, "Artificial Intelligence has large potential to contribute to global economic activity." They then proceed to say, "Its contribution to

growth might be three or more times higher by 2030 than it is over the next five years (Bughin et al. 2018).” The sheer amount of possible production by Artificial Intelligence is unprecedented and it could create a prosperous and thriving society for the adolescents who will be able to build upon it and contribute to its growth. Buglin et al. also mentioned that “AI has the potential to deliver additional global economic activity of around $13 trillion by 2030.” This amount of economic growth is unbelievable as it can create an entirely flourishing economy compared to our present one.

In Engineering, there are quite a few negative effects it can have on adolescents and their futures. It can range from the pollution that the devices present in the environment to the addictive creations and experiences that were engineered to be as such. An article by Berthon et al. says this, “we are addicted to our digital devices—or, more precisely, the digital experiences they enable… this addiction is both akratic and engineered.” They then go on to say “Marketers are complicit in this engineering: through digital networks and big data they ubiquitously monitor and experiment on consumers (Berthon et al. 2019).” These points assert that not only are devices being engineered in a way that makes them addictive but it has gotten to so much so that we as a society and especially adolescents are aware of the effects and do not care. Due to this, the article then states, “This knowledge is used to create ever-more addictive digital experiences enabled by devices, their platforms, and their content (Berthon et al. 2019).” With this point being known, one can conclude that the engineering behind our phones, televisions, and all other technological devices was made to keep us hooked and interested. It is why we now have technology present in classrooms and cars as the convenience has seemingly over time became a reliance.

In the realm of understanding the effects of digital technology on adolescents, both sociology and psychology offer unique perspectives that complement and contrast each other. While both disciplines explore the intricate relationship between digital technology and adolescent behavior, cognition, and social interactions, they do so through distinct lenses. The first comparison is through the scope of analysis. Sociological perspectives encompass a broad examination of digital technology's impact on society, focusing on how it shapes social structures, norms, and interactions. Researchers in sociology, such as Ives, emphasize the role of digital technology in addressing social inequalities and facilitating inclusivity among adolescents from diverse backgrounds. Psychology, on the other hand, zooms in on individual psychological processes and well-being in response to digital technology. Scholars like Subrahmanyam highlight the positive aspects of digital technology, such as its ability to facilitate social interaction, motivation, and self-expression. However, research by Twenge reveals the potential negative psychological effects, including decreased well-being and difficulties in forming meaningful connections. The second comparison is going to be on emphasis. Sociology tends to emphasize the societal implications of digital technology, particularly its role in perpetuating or mitigating social disparities. Dienlin and Johannes' research, for instance, underscores the risks of excessive digital technology use, such as limited social interaction and the proliferation of unrealistic perceptions through social media. Psychology, meanwhile, underscores the psychological ramifications of digital technology on individuals. While acknowledging the positive aspects, psychologists like Twenge caution against the potential negative consequences, such as decreased psychological well-being and diminished curiosity.

The key contrast lies in the level of analysis and emphasis. Sociology takes a macro-level approach, focusing on societal structures and norms, while psychology adopts a micro-level

perspective, examining individual behavior and cognition. Additionally, while sociology highlights the potential for digital technology to exacerbate social inequalities, psychology delves into both the positive and negative psychological effects on adolescents.

Sociology and engineering offer unique perspectives on the effects of digital technology on adolescents. Sociology delves into the societal implications of digital technology, examining its influence on social structures, interactions, and cultural norms. This discipline explores issues such as social inequality, online communities, and the transformation of traditional social dynamics. Conversely, engineering focuses on the technological innovations driving digital technology's development and societal impact. It is primarily concerned with designing and implementing digital tools and systems to enhance connectivity, efficiency, and user experience. Both disciplines assess the impact of digital technology on adolescents, albeit from different angles. Sociology evaluates the holistic impact, considering its effects on social cohesion, identity formation, and civic participation. To explore these aspects, sociology employs qualitative and quantitative research methods such as surveys, interviews, and ethnographic studies. Meanwhile, engineering emphasizes the technical functionalities and performance of digital technology. It prioritizes aspects such as system architecture, algorithmic efficiency, and user interface design to optimize technological solutions according to user demands and market trends.

Despite their shared interest in digital technology's effects on adolescents, sociology and engineering differ in their focus of inquiry and methodological approaches. Sociology delves into broader social dynamics and cultural shifts precipitated by digital technology's proliferation among adolescents. It seeks to understand questions related to digital inequality, online behavior, and the reconfiguration of social norms in the digital age. In contrast, engineering centers on

designing and developing digital technology solutions, emphasizing technical considerations and problem-solving approaches. While sociology employs qualitative and quantitative research methods, engineering utilizes iterative design processes, prototyping, and testing to refine digital products and optimize their performance.

Digital technology's impact on adolescents is studied through the lenses of psychology and engineering. Psychology delves into cognition and emotion, examining both the positive, like increased connectivity, and negative aspects, like decreased attention span. It explores individual experiences and mental processes using various research methods. Engineering, on the other hand, concentrates on optimizing technology, considering user preferences to enhance usability. Both disciplines share an interest in understanding digital technology's effects on adolescents' behavior and well-being, although they approach the subject from different angles.

Psychology and engineering diverge in their methodologies and focus. While psychology delves into the individual experiences and psychological processes influenced by digital technology, employing experiments, surveys, and observational studies, engineering prioritizes technical aspects like system architecture and user interface design. Psychology aims to understand the nuanced psychological effects of technology, whereas engineering emphasizes the optimization of digital products to meet functional requirements and user demands. Despite these differences, both disciplines contribute valuable insights to our understanding of how digital technology shapes adolescents' lives.

Moving forward, interdisciplinary collaboration is essential for addressing these challenges and harnessing the transformative potential of digital technology for the benefit of society. Psychologists, sociologists, and engineers can work together to develop evidence-based

interventions, policies, and technologies that promote responsible digital citizenship, mitigate harmful effects, and foster inclusive, sustainable, and ethically grounded digital futures.

The effects of digital technology on adolescents and their future has so many different arguments that are against and for its emergence and future. This is why it must be self regulated and safe habits must be taught and passed down. While digital technology offers opportunities for connectivity, innovation, and empowerment, it also presents challenges related to mental health, social dynamics, privacy, equity, and sustainability.

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