

# **Digital Dilemma: The Rise of Internet Addiction**

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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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## **I. Introduction**

Connor, a 17 year old who enjoyed playing video games in his free time, came to his mother for help one night when he realized his favorite pastime was becoming far more than just a casual hobby. After three years of consistent gaming, Connor had let himself fall into the comfort of the virtual world too much, and he started having problems in the real world: skipping school, severe loneliness, and repeatedly failing his pre-university exams. After spending so much time playing games, he no longer had the motivation to participate in the stressful and tiresome reality of being a socially active teenager, and instead chose extreme isolation, hiding out in his own home during school hours to avoid any interaction with the world outside his computer. This story, recounted in the National Post (2013) by Connor's mother, is just one of hundreds of thousands of cases across the globe of internet addiction. While a relatively novel idea, internet addiction has been linked with depression, anxiety, poor sleep, worsened student performance (Demirci et al., 2015, p. 86; Young, 2004, p. 410), and has been steadily spreading since the early 2000s. In this paper I will analyze how different social groups such as corporations and internet addicts shape the internet-based technology we use, through the Social Construction of Technology (SCOT) theory. The novelty of the internet addiction problem, the agendas of technology companies, and multiple social factors all contribute to the development of internet addiction into the issue it is today, and I will discuss how the issue can be best addressed with respect to these three tenets. Internet addiction, although not officially classified as a mental disorder, can have extremely detrimental effects on those affected by it, and in order to stop internet addiction from becoming even more widespread it is necessary for companies, individuals, and society at large to make significant changes.

## **II. The Dangers of Internet Addiction**

Despite its current lack of a formal classification as a disorder, internet addiction should be treated as a real and dangerous issue. Existing research literature regarding the plausibility of internet addiction as a distinct mental disorder is somewhat inconclusive. While internet addiction is not currently recognized in the Diagnostic and Statistical Manual for Mental Disorders (DSM) or the International Classification of Diseases (ICD), the ICD does recognize gaming disorder as a disease. The ICD-11 describes gaming disorder as a "persistent pattern of video-gaming behavior" over an extended period of time which results in "significant distress or impairment in personal, family, social, educational, occupational, or other important areas of functioning". This classification, as video games are a subset of the internet based services often linked with internet addiction, provides a clear basis for the possibility that a more inclusive disease category could be established in a similar way in the future.

An oft-cited study from 2015 studied university students' smartphone usage, while also measuring psychological states such as depression and anxiety and sleep quality. The researchers

found that high Smartphone Addiction Scores were positively correlated with depression and anxiety levels, as well as low sleep quality scores (Demirci et al., 2015, p. 86). Compulsive internet usage has also been linked to online affairs, in which users form relationships with people outside their marriage, often viewing the online relationship as a more glamorous escape from their daily life (Young, 2004, p. 406). Young also comments on negative cases of internet use at work and university. In a survey of over 200 corporations done by WebSense, 64% of those surveyed had disciplined employees for excessive internet use, and 30% had fired employees for the same reason. Specifically, pornography, online chatting, and gaming were most often the cause of disciplinary action (Young, 2004, p. 411). Young also found that 58% of students experienced poor study habits and worsened grades due to internet use. These results are corroborated by Samaha and Hawi, who found that smartphone addiction risk was negatively correlated with academic performance. Additionally, the risk was also associated with lower life satisfaction (Samaha and Hawi, 2016, section 1.2).

Because of these findings, it is clear that while internet addiction is not officially recognized as a disease or mental disorder, the consequences of compulsive and/or excessive internet and video game use are too significant to ignore. If these were mostly isolated incidents occurring only in small groups, perhaps this relationship could be brushed off as trivial. However, it's clear that the number of people affected by these symptoms is only growing, and will continue to grow. The internet is deeply ingrained within our modern day society, such that one can feasibly spend entire days in the digital world. Because of this, it can be difficult to remove yourself from the internet, as even necessities such as working, paying bills, and communicating with friends and family often require use of the internet or digital technology in some way. This reliance may make the recognition that the internet and the services that come along with it can be extremely destructive. Despite all of the findings to suggest that internet addiction is a very real issue, some academics dismiss it as too similar to a mere combination of existing mental disorders, such as Andreassan et al., who suggest that "the concept of Internet use disorder (i.e., "Internet addiction") as a unified construct is not warranted" (Andreassan et al., 2016, Abstract section). However, I believe that evaluations such as these are misleading, and frankly destructive. I believe that establishing internet addiction as a real concept, even if not as a medical disorder, is necessary to start taking steps towards solving it, as internet-based technologies are only getting more widespread.

### **III. The Role of Companies**

The companies that create addictive products are heavily contributing to the problem of internet addiction, and have a responsibility to make their products less addictive. From the current collection of data available, I believe that the internet addiction problem can be

accurately described using the Social Construction of Technology theory (SCOT). The SCOT theory is a constructivist theory that posits that technology is developed through human behavior, not that technology determines human behavior (Pinch and Bijker, 2012, p. 22). There are various different social groups involved with the problem of internet addiction, all of whom contribute to it in different ways. Technology corporations have perhaps the most significant and direct effect on the development of internet addiction, as they create the addictive products. It is, unfortunately, directly beneficial for tech corporations to create products which are addictive to their consumers, as the more a consumer uses their product, oftentimes, the more profit is generated. Therefore, it is often in the company's best interest to maximize addictiveness. This can be ultimately reflected within the final product in many different ways.

TikTok, a relatively new social media app in which users can give short (a few minutes maximum) form video content through an endless-scrolling style custom feed, is one such example of an addictive product. An article by the New York Times describes how the app's creators explicitly value an "ultimate goal" of maximizing active daily users by optimizing user retention and time spent in the app (Smith, 2021, para. 8). This strategy has clearly worked: as of 2023, the app has over one billion monthly active users (Dean, 2023, TikTok Statistics section). In order to achieve this goal of maximizing active users, companies such as TikTok employ algorithms that offer users only the content that they are most likely to engage with, to keep them interested as long as possible; if a user stops seeing videos they like, they're bound to log off. TikTok uses multiple factors such as number of likes, number of comments, playtime, and whether or not a user has watched similar content before, in order to recommend videos (Smith, 2021, para. 12). This kind of strategy can be dangerously addictive.

Another social media platform, YouTube, a video platform which allows users to create and share longer form video content, is also known for being similarly addictive. A study from 2018 that studied frequent YouTube users (both addicted and not-addicted), found that compulsive YouTube use was oftentimes resulting from how the available content was shown to users: "The social network contribution to compulsive use of YouTube can be passive, even distant and opaque from the user: the links that appear to the right of the video currently showing, and the video that begins automatically a few seconds after one video ends, reflect shared interests across the network of YouTube videos in the current, recently viewed and linked videos" (Klobas et al., 2018, p. 278). The YouTube platform is designed to keep users watching as much as possible, and this contributes towards problematic use for people like Adam, who participated in the study, and reported that his YouTube use hurt his relationship with his parents, caused his girlfriend to break up with him, and ruined his academic performance (Klobas et al., 2018, p. 273). While we can't expect companies to entirely remove their recommendation algorithms, as they are more or less required to create an effective product, there are other ways in which these addictive services can be more tailored towards mitigating compulsive behavior. Modifying the user interface on a platform like YouTube to limit the number of suggested videos that can be viewed at a given time, removing the video autoplay feature, and providing warnings

when users have been on the platform for long periods of time can all help support healthier practices for users while maintaining the effectiveness of the platform for providing content that users enjoy. For an app like TikTok, breaking up the video feed with timed breaks, advertisements, or even forcing users to manually re-login every time they open the app, could reduce user screen time while keeping the recommendation algorithm the same.

Video game companies also represent a social group with a large impact on the internet addiction landscape. Similar to social media based tech companies like the aforementioned TikTok, video game companies are incentivized to make their games as addicting as possible, especially with the advent of free-to-play games and microtransactions. Some games, such as World of Warcraft, require active monthly subscriptions in order to even play the game: a clear incentive for companies to keep players playing. Others, such as Fortnite and League of Legends, will offer players cosmetic items or in-game advantages if users pay a specified fee, so players are motivated to spend money to improve their gaming experience. Some games will even directly implement advertisements, such as Candy Crush, which provide a form of revenue for companies which directly increases with playing time. There is a lot of money to be made in this area of gaming: Fortnite alone made \$9 billion total in 2018 and 2019, solely from in-game purchases (IGN, 2021, para. 1).

While it's clear that companies have reasons to keep players as engaged as possible, what mechanisms are they using to do so? According to an organization dedicated to the addictive effects of video games, Game Quitters, game companies use a variety of techniques including variable reward rates, loot boxes, and daily rewards to maximize play time. Studies have shown that rewarding players inconsistently results in the most effective mode of reinforcement, so games will only give players rewards at seemingly random intervals instead of after every game won, for example (Game Quitters, n.d., Changing the Rate of Reinforcement section), which keeps them playing in search of the next reward. They will also use loot boxes, which are virtual items that contain random loot items of varying scarcity, and cost real money. Loot boxes are often seen as forms as gambling, and encourage players to spend large amounts of money to improve their in-game status (Game Quitters, n.d., Loot Boxes section). Daily rewards are also used, which are rewards given to users who play a game daily over a significant period of time, where the best rewards can only be acquired with a long streak of daily log-ins (Game Quitters, n.d., Streaks and Daily Rewards section). These techniques are all unregulated, and although they may not be intended as explicitly harmful to consumers, they all help contribute to a player base which compulsively plays games to improve their online social status, get a bigger dopamine hit (Walia, et al., 2022, p. 2), or hit it big with a rare item from a loot box. To help mitigate the impact that video game company monetary interests have on addiction in their customers, limits should be placed on the reward techniques that are to be implemented within games. Warning gamers or limiting some of the more extreme systems in place that keep gamers coming back could provide those with addictive tendencies a better chance at a healthy relationship with games. For example, providing disclaimers on loot boxes about their similarity

to gambling, as is common in sports betting apps; limiting the number of loot boxes a player can purchase; or requiring that games provide warnings after long periods of playing time could be effective methods for mitigating compulsive behavior.

#### **IV. Changes at the Individual Level**

Along with changes stemming from the corporations that create addictive products, efforts to curb internet addiction on a more individual level are also necessary to mitigate the problem at large. Factors such as implicit societal pressure to use social media and other addicting technology, a lack of education on internet addiction, and a lack of resources for those seeking individual help result in a higher likelihood for individuals to get and stay addicted.

One societal cause for high technology use (leading to addiction) is peer pressure to use social media and other internet-based services. A 2023 study that researched the effects of peer pressure on social media use in adolescents found that peer pressure significantly predicted social media addiction, and that increased self esteem resulted in weakened peer pressure and therefore lower rates of addiction (Xu et al., 2023, p. 5). On top of this, a survey conducted by the Pew Research Center, a nonpartisan think tank, showed that 67% of social media users cited staying connected with *current* friends as a major reason for their social media use, with 24% citing it as a minor reason (Smith, 2011, para. 1). Simply put, one of the main reasons compelling us to use one of the more addicting forms of internet-use, social media, is just because our friends are doing it too. To help mitigate this, encouraging frequent internet users, especially teenagers and young adults, to take advantage of mental health counseling to increase their self esteem, or to use more barebones ways of communicating with their peers such as texting, can help improve reliance on and possible addiction to the internet.

Another contributing social factor for internet addiction is a lack of education on the subject. Contrary to more established addictions such as alcoholism and drug addiction, due to the novelty of internet addiction as a concept, it is not often taught to those most susceptible to it in a formal education setting. Programs such as D.A.R.E or Drug Abuse Resistance Education, have been prolific throughout American elementary schools since the 1980s, and teach students about the dangers of drug use, gang involvement, and violence. While it's important to recognize the limitations of a program like D.A.R.E, as it has been shown to be somewhat ineffective due to its heavy emphasis on abstinence from drugs entirely as opposed to safe drug use practices (Gaines & Cohen, 2023, The "The 'just say no' messaging of the past didn't work" section), D.A.R.E is still standing on a good basic principle: that we should be instilling in children the dangers of things which can harm them through a formal system. Implementing a system like D.A.R.E for internet addiction, with the caveat that it not fall into the pitfall of encouraging zero internet use, and instead encourages healthy internet use in moderation, could help students and children understand the downsides of high internet use before addiction develops while presenting them with methods for curtailing any impulsive behavior that does form.

The last social factor I will cover is the lack of resources for individuals seeking remediation. Similar to the other factors covered above, this stems from the recency of the addiction as an established issue. Other, more established addictions usually have many, extensive support systems for those suffering from said addiction, oftentimes in different forms depending on what would be most effective for the individual. For example, Narcotics Anonymous groups, rehab centers, and therapy have all been used, successfully, to treat those suffering from drug addiction. While there are some current ways in which internet addicts can receive treatment, they are still somewhat limited. Groups such as Internet and Technology Addicts (ITAA) and Reboot & Recover serve as one such example. ITAA does this through narcotics-anonymous style group sessions, and has grown significantly in popularity since its inception. During its first year of operation only a few members were involved; however, now there are “over 100 weekly online meetings and a dozen face-to-face meetings around the world”, with members “[that] hail from over 80 countries” (ITAA, 2023, About page); this shows that there is clearly demand for internet addiction rehabilitation. Reboot & Recover uses traditional one-on-one therapy as its main form of treatment, as well as an interesting social-media based challenge to encourage lower screen time. The “#ScreenTimeChallenge” was created by R&R and involves the participant sharing their screen time online to create a sort of social accountability. Another, more alternative approach, is HealthyGamerGG. HealthyGamerGG is a website founded by a Harvard-trained psychiatrist and recovered addict with associated YouTube and Twitch channels, who provides resources through a medium which many addicts are familiar with (video-streaming platforms). Popular videos include topics on compulsive video game use, how the internet affects love and relationships, and interviews/unofficial therapy sessions with popular video game streamers discussing their addictions and possible remediation strategies. These familiar formats of YouTube and Twitch can help lower the barrier to addicts seeing help; the YouTube channel alone has around 260 million total views and almost 2 million subscribers. While these are positive steps towards creating more developed systems for internet addiction remediation, they are still somewhat limited compared to what is available for more traditional addictions. Further expanding upon these current solutions and developing even more will greatly increase the potential for reduction of internet addiction at the individual level.

## **VI. Conclusion**

As studies have clearly demonstrated that internet addiction is a growing and severe issue in the US, it is therefore necessary that steps be taken to ensure individuals have access to effective addiction prevention/recovery resources, and that the necessary societal and corporation-level changes be enacted to help encourage individual success in avoiding addiction. Technology will only become a more dominant part of our lives as we continue to innovate, and with technological advancements such as virtual reality and augmented reality becoming more prevalent by the year, the ability for individuals to escape into virtual spaces will only become

more appealing. If addiction is already a serious issue in the modern technological sphere, the arrival of virtual and augmented reality should serve as a warning sign for the potential harm that comes with rapid innovation without addressing the pitfalls of our current situation; it may be beneficial to slow down and evaluate, or in other words: just because we can build it doesn't necessarily mean we should. There is still lots of room for research regarding internet addiction, and I hope more work is done to learn about medical solutions to internet addiction, internet addiction's psychological similarity to existing conditions, and more ethical ways for companies to create engaging and enjoyable products without encouraging addictive practices.

## V. References

Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The Relationship Between Addictive Use of Social Media and Video Games and Symptoms of Psychiatric Disorders: A Large-Scale Cross-Sectional Study. *PSYCHOLOGY OF ADDICTIVE BEHAVIORS*, 30(2), 252–262.

<https://doi.org/10.1037/adb0000160>

Demirci, K., Akgonul, M., & Akpinar, A. (2015). Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. *JOURNAL OF BEHAVIORAL ADDICTIONS*, 4(2), 85–92. <https://doi.org/10.1556/2006.4.2015.010>

Geisel, O., Lipinski, A., & Kaess, M. (2021). Non-Substance Addiction in Childhood and Adolescence: The Internet, Computer Games and Social Media. *Deutsches Ärzteblatt International*, 118(1/2), 14–21. <https://doi.org/10.3238/arztebl.m2021.0002>

*ICD-11 for Mortality and Morbidity Statistics*. (n.d.). Retrieved February 7, 2024, from

<https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/1448597234>



Klobas, J. E., McGill, T. J., Moghavvemi, S., & Paramanathan, T. (2018). Problematic and extensive YouTube use: First hand reports. *Online Information Review*, 43(2), 265–282.

<https://doi.org/10.1108/OIR-01-2018-0032>

Li, Y.-Y., Sun, Y., Meng, S.-Q., Bao, Y.-P., Cheng, J.-L., Chang, X.-W., Ran, M.-S., Sun, Y.-K., Kosten, T., Strang, J., Lu, L., & Shi, J. (2021). Internet Addiction Increases in the General Population During COVID-19: Evidence From China. *The American Journal on Addictions*, 30(4), 389–397. <https://doi.org/10.1111/ajad.13156>

Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *COMPUTERS IN HUMAN BEHAVIOR*, 57, 321–325. <https://doi.org/10.1016/j.chb.2015.12.045>

Smith, B. (2021, December 6). How TikTok Reads Your Mind. *The New York Times*.

<https://www.nytimes.com/2021/12/05/business/media/tiktok-algorithm.html>

*TikTok Statistics You Need to Know in 2024*. (2023, December 11). Backlinko.

<https://backlinko.com/tiktok-users>

*What is the Definition of Addiction?* (n.d.). Retrieved February 7, 2024, from

<https://www.asam.org/quality-care/definition-of-addiction>

Young, K. S. (2004). Internet Addiction: A New Clinical Phenomenon and Its Consequences. *American Behavioral Scientist*, 48(4), 402–415.

<https://doi.org/10.1177/0002764204270278>

Quitters, G. (2019, May 24). *Are Video Games Designed to Be Addictive?* Game Quitters.  
<https://gamequitters.com/are-video-games-addictive/>

Valentine, R. (2021, May 3). *Fortnite Made \$9 Billion in Two Years, While Epic Games Store Has Yet to Turn a Profit.* IGN.  
<https://www.ign.com/articles/fortnite-made-9-billion-in-two-years-while-epic-games-store-has-yet-to-turn-a-profit>

Smith, A. (2011, November 15). Why Americans use social media. *Pew Research Center: Internet, Science & Tech.*  
<https://www.pewresearch.org/internet/2011/11/15/why-americans-use-social-media/>

“My son was addicted to the Internet”: A mother’s story of the battle to save her teenager’s life from online gaming. (n.d.). Nationalpost. Retrieved March 20, 2024, from  
<https://nationalpost.com/health/my-son-was-addicted-to-the-internet-a-mothers-story-of-the-battle-to-save-her-teens-life-from-online-gaming>

*Mental Health for the Internet | Healthy Gamer.* (n.d.). Retrieved March 21, 2024, from  
<https://www.healthygamer.gg/>

*Internet and Technology Addicts Anonymous | Receive Free Help & Support.* (n.d.). Internet and Technology Addicts Anonymous. Retrieved March 21, 2024, from  
<https://internetaddictsanonymous.org/>

*Reboot and Recover.* (n.d.). Reboot & Recover. Retrieved March 21, 2024, from  
<https://rebootandrecover.org/>

Gaines, L. V. (2023, November 9). “Just say no” didn’t actually protect students from drugs. *Here’s what could*. NPR.

<https://www.npr.org/2023/11/09/1211217460/fentanyl-drug-education-dare>

Douglas, D. G. (2012). *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (W. E. Bijker, T. P. Hughes, & T. Pinch, Eds.). The MIT Press. <http://www.jstor.org/stable/j.ctt5vjrsq>

Xu, X., Han, W., & Liu, Q. (2023). Peer pressure and adolescent mobile social media addiction: Moderation analysis of self-esteem and self-concept clarity. *Frontiers in Public Health, 11*, 1115661. <https://doi.org/10.3389/fpubh.2023.1115661>