



BENEFITS OF RECREATIONAL GAMING AND E-SPORTS FOR YOUNG PEOPLE

Literature review

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The Centre for Resilient and Inclusive Societies

CRIS is a Melbourne-based think tank consortium of academic, community and industry partners, which delivers research and informs policies that advance and enrich our local, national, and international community cohesion and resilience. CRIS works on issues including social polarisation and disengagement from the public sphere, the rise of social exclusivist identities based on ethnicity, religion or culture, the influence of global conflicts and tensions on local environments and actors and the social harms created when grievances and alienation translate into violent action against specific groups or society at large.

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Young and Resilient Research Centre

The Young and Resilient Research Centre is an Australian-based, international research centre that unites young people with researchers, practitioners, innovators, and policymakers to explore the role of technology in children's and young people's lives and how it can be used to improve individual and community resilience across generations.

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INTRODUCTION

About two third of the Australian population play video or digital games (Brand et al., 2019). With digital games (or simply “games”) we mean every form of gameplay that can be performed on a digital device. Among children and young people (5-24 years old) this percentage rises to more than 80 percent (ibid.). On average children (between 5 and 14 years old) spend an hour every day on games. Young people (between 15 and 24 years old) spend more than two hours per day playing. A quarter of those who play games equally spend time on game-related activities, like cosplay (costume play), game-design and esports. Having fun, relaxing, and passing time are the most commonly mentioned reasons for young people to play. In this literature review we focus on *recreational gaming*, which we define as playing digital games for a recreational purpose. We will also consider esports, as watching and participating in esports is an increasingly common leisure activity among Australians (Brand et al., 2019).

Gaming unmistakably plays an important role in the leisure time of Australians, young and old. Considerable recent scholarship has sought to understand the benefits of recreational gaming in terms of health and wellbeing, academic outcomes, and social benefits. Games and serious games are increasingly used in sectors such as education (Zhonggen, 2019), mental health (Lau et al., 2017), environmental awareness (Pollio, Magee and Salazar 2021) and in corporate settings (Larson, 2020) with positive outcomes. Noting the general absence of robust studies on direct relationships between gaming and a more general sense of wellbeing, recent work by Johannes, Vuorre and Przybylski has shown that time spent playing certain mobile games does appear to correlate with wellbeing among adults in the UK. As the authors note, this correlation does not imply causation, but does suggest that, as outlets for play, digital gaming can be part of a healthy mix of activities for young people as well as adults.

However, the growing popularity of certain types of digital games has also raised concerns. Earlier scholarship, for instance, was concerned about the influence of violence in games on young people (Anderson et al. 2010). However, many critics highlight that a causal link to real-life violence and violent games has never been established (Ferguson et al., 2017). Addiction is another common issue that has attracted both public and academic concern. While the DSM-V has stipulated diagnostic criteria for so-called *Internet Gaming Disorder (IGD)*, they have been criticised by some scholars for not being sufficiently differential (Paulus et al., 2018). Comorbidities are common in those affected by IGD as well as external factors, like personal and family issues (ibid.) The prevalence of IGD in the gaming and wider community also remains a matter of debate (Mihara & Higuchi, 2017). More recently, gambling in the form of in-game **loot boxes** has raised concerns with academics (Zendle et al., 2019).

LOOT BOXES AND IN-GAME PURCHASES

Loot boxes are randomly assigned items (or rewards) in games that can be purchased by real-life money. Loot boxes have been banned in some countries, because of its perceived relationship with gambling; they often involve a chance aspect (Zendle et al., 2019). Since in-game purchases in games have become more common with free-to-play models (Marder et al., 2019), some studies have focused on the positive effect of in-game purchases. Marder et al. (2019), for instance, found that gamers often use digital objects for social cohesive goals, like supporting the game-developer and the game community, rewarding oneself for one’s achievements, and gifting to other players. Musabirov and colleagues (2017) looked at

players' motivations behind the purchase of cosmetic items in games, which offers aesthetic pleasure that often goes beyond in-game usefulness.

The aim of this review is to look at how gaming can support young people in the domains of community building (section A), career pathways (section B) and the development of soft skills (section C). In section A we focus on how games and esports can have beneficial effects for young people and their environment, including social networks, school, and society at large. We consider mental health and wellbeing to be an integral part of healthy communities, so this will be discussed in this section as well. In section B we give an overview of the career pathways in Australia that are related to recreational games, as well as the benefits that recreational gaming might offer for employment opportunities. In section C we focus more explicitly on the soft skills that can be developed by gameplay. We discuss a selection of 21st century skills that have attracted academic interest, such as teamwork, leadership skills, self-regulation, creativity, and academic interest.

A. COMMUNITY ENHANCING EFFECTS OF DIGITAL GAMEPLAY

Wellbeing and Stress Relief

The pleasure and enjoyment aspects of digital gameplay have been widely discussed and theorised upon by game scholars (Sweetser et al., 2005). Here we will focus on the more instrumental role that playing digital games may play in the management of wellbeing, for instance through stress relief or as a coping mechanism for adverse emotional affect. Recent research has shown how serious games have shown to be effective in therapeutic settings, for instance, in relation to mental and physical disability (Concepcion, 2017) or pain relief (Fairclough et al., 2020). Our focus here will be on recreational play and esports and its positive effects on children's psychological wellbeing.

There is an extensive body of research about the negative aspects of gaming on children's wellbeing. Issues like addiction (Paulus et al., 2018), violence (Ferguson et al., 2017) and depression (Lobel et al., 2017) are among the topics that have been heavily debated by scholars. However, the evidence-base is contradictory. For example, contrary to popular perceptions, a recent study of European school-aged children has demonstrated that high video game usage (more than five hours per week) was correlated with a lower prevalence of mental health issues compared to low usage (Kovess-Masfety, 2016). Johannes, Vuorre & Przybylski (2021) found a small but significant correlation between game time and affective dimensions of well-being (rather than cognitive one). Careful not to draw any conclusions, the authors suggest that an average of a 3.5 hours increase in play time (on a two-week basis) is associated with increased well-being. Other studies, however, have found a link between gaming frequency and depression (internalising problems) in children (e.g., Lobel et al., 2017).

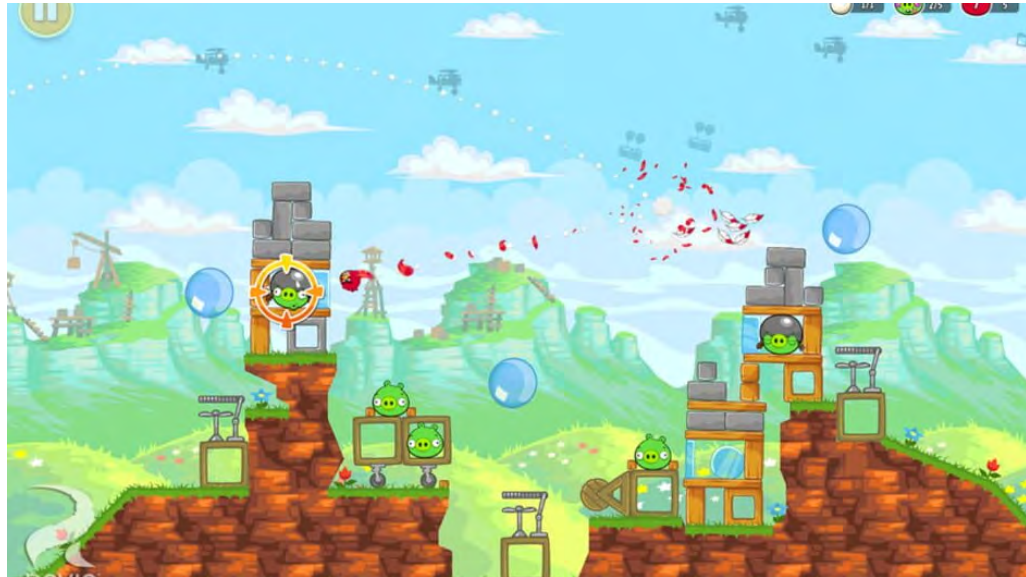
On online forums, gamers often report that their gaming can be a cathartic experience - especially engagement when more violent games are concerned - and that gaming offers a way of stress-relief by temporarily escaping from the demands of the outside world (Bourgonjon et al., 2016). Research suggests that, especially for those with lower confidence, gaming can function "as a distraction from difficulties and a means of regulating emotions to feel a sense of achievement." (Caro and Popovac, 2020). Iacovides & Mekler, 2019 found that some people use games as a coping mechanism for difficult life situations. Games can provide respite, connection, and a way of dealing with feelings according to the participants who participated in this study. However, some studies

have found that those who play games for escapist motives are often more at risk of mental health issues, such as shyness, loneliness, and low self-esteem, compared to those who play for social motives (Von der Heiden et al., 2019).

Just as motives for playing might affect mental health outcomes, so might the kind of games that are being played. Action games, for instance, have the greatest correlation between both positive and negative affect while playing, suggesting that they are both a source for relaxation and frustration (Von der Heiden et al., 2019). Other studies have reported that playing **casual games** has a positive effect in reducing psycho-somatic stress symptoms (like heart rate and blood tension) compared to relaxation exercises (Pine et al. 2020). Rupp et al. (2017) found that playing casual games in between a cognitive task, decreased negative affect and worry while increasing positive affect and task engagement, compared to meditation and a passive break. Another study found that mindfulness was a more effective way of stress-reduction, but a casual game proved similarly effective in reducing stress symptoms (both physical and self-reported) (Desai et al. 2021).

CASUAL GAMES

Casual games are defined by Juul (2010) as games that require relatively little effort to learn and that can be played in a relatively short amount of time. They often have rich and attractive colour schemes and frequently are based around a funny or light-hearted theme. An old school version of a casual game is *Tetris* (1984). Some more recent popular casual games include *Bejewelled* (2001), *Angry Birds* (2009) and *Among Us* (2018). Today, with the prevalence of mobile devices, casual games are the most popular form of games, according to US data (Entertainment Software Association, 2019).



In Angry Birds (2009), the player has to launch a bird to destroy fortresses in which pigs are incarcerated (Image: Rovio Entertainment).

SUMMARY

- Both young and old people play games to relieve stress and relax
- While some studies have found a relation between gaming frequency and mental health issues in children other studies have found a positive relationship between children's mental health and frequent gaming (more than 5 hours per week)
- Games offer opportunities for people to cope with difficult life situations
- Social reasons are a healthier motive for playing games than escapist motives, escapist players being more at risk of mental health issues.
- Casual games have been shown to relieve physical signs of stress (e.g., lower heart rate and blood tension)

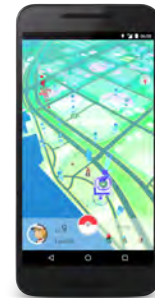
Social Connections and Inclusiveness

The social dimensions of many multiplayer's games would suggest that games also have social benefits. These social benefits can have positive individual as well as community outcomes. An Irish study among school-going children found a correlation between prosocial gameplay and prosocial behaviour, as well as empathy (Harrington & O'Connell, 2016). A Chinese study found that both violent games and neutral games were related to pro-social behaviour as long as they were cooperative in nature (multiplayer) (Jin & Li, 2017). In fact, a recent longitudinal study from The Netherlands found that children who play competitive games show a decrease in behavioural problems and an improvement in peer relationships (Lobel et al., 2019).

Games can also be a way to make new friends. A small study among Japanese gamers found that online gaming can result in online acquaintances, online friends and in some cases even offline friendships (Lai & Fung, 2020). Qualitative research among young people with ASD (Autism Spectrum Disorders) found that people on the spectrum value gameplay for the social connections, something that is notoriously difficult for people in this group. However, most studies stress that those who are playing games just to find new friends are more prone to loneliness and a decreased sense of life satisfaction than those who play to maintain friendships (Yang, C. C., & Liu, D., 2017). Maintaining friendships as a motive to play Pokémon Go was positively correlated with life satisfaction (ibid). In fact, several studies have shown that games can foster already existing social networks. Osmanovic, S., & Pecchioni, L. (2016), for instance, have shown through interviews with both younger and older participants that games can positively affect intergenerational bonds. Some research participants expressed the feeling of staying connected to their parents after they left the home.

POKÉMON GO

Pokémon Go (2016) is a so-called Augmented Reality Game (ARG) in which gameplay is integrated with the user environment through mobile location devices. The player can catch and collect creatures in real-life worlds through the mediation of a smartphone. Consequently, players can battle against other players with the creatures they have captured. (Image: Nintendo)



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Increasing isolation, due to worldwide lockdowns imposed to limit the spread of COVID-19, has increased the need for social bonding at a distance. A recent German-Austrian study found that gaming with a social motive (instead of an escapist one) decreased the sense of perceived loneliness (Nebel, S., & Ninaus, M., 2020). Additionally, increased gaming during the pandemic was not correlated with loneliness. A study into the MMORPG *World of Warcraft* (2004), found that players experienced less loneliness and anxiety in the game than in the real world (Martoncik & Loksa, 2016). Replicating previous studies (e.g., Yang & Liu, 2017) playing with known people was more beneficial to reducing loneliness than playing with unknown people. Similarly, another study found that those players who had a 'richer' social online life were less at risk from gaming disorder (Carras et al., 2017).

MMORPG

Stands for Massive Multiplayer Online Role-Playing Game. These games involve vast virtual worlds, usually with a fantasy theme, in which a large number of players can play together (Sourmelis, 2016). Players often have one or more characters (role-play) that they can develop through the game. *World of Warcraft* (2004) is an example of a MMORPG that has been on the market for a while and is still being developed and updated. (Image: Blizzard)



SUMMARY

- Some recent studies have shown that the children who play games with others are less prone to behavioural issues and show more prosocial behaviour.
- Playing online multiplayer games, like World of Warcraft, can reduce feelings of loneliness. Especially those who have difficulties with social connections, such as people with ASD
- Playing games to foster existing friendships have shown to increase life satisfaction
- Some people develop friendships through recreational gaming
- Intergenerational gaming can enhance bonds between different generations

Community Building & Civic Engagement

Gee (2003) argues that games are an example of “affinity spaces”. These spaces are marked by “goals, desires, feeling, and values that insiders in that domain recognize as sorts of that domain” (Gee, 2003, p. 97). In this section we will discuss some recent examples from the academic literature in which the community nature of games extends to real life communities and helps to create civic engagement.

Games are micro-communities in themselves, with members creating strong feelings of attachment to the game and the ‘game world’, that includes activities ‘outside’ of the game, like online forums or fan art (e.g., Alavesa & Xu, 2020). The Stardew Valley forum on Reddit, for instance, can be characterised by community building and self-improvement, in the way members share positive imagery about the game (Santiago, 2016). In-game communities are common in online multiplayer games like World of Warcraft (Rapp, 2018).

STARDEW VALLEY

Stardew Valley (2006) is a popular independently produced simulation role-playing game with a simple graphic lay-out in which a player has to manage a farm by planting and harvesting crops and taking care of live cattle (Santiago, 2016). (Image: ConcernedApe).



A Korean Study found that especially strategy games and role-playing games enhance game-related community participation and gaming identity (Jung, 2020b). Indeed, online role-playing games offer rich and diverse communities with their own rules and customs (Nardi, 2010). These communities often overlap with real world politics. An example of this is how the Proudmoore server became the unofficial home for LGBTQI gamers guilds in World of Warcraft, providing a safe space for a community that often faces abuse in online (or in game) spaces (Skardzius, 2018).

SERVERS AND GUILDS

MMORPGs (also called: *MMOG*) often operate on different servers. Game companies limit the number of players that can be active on a specific server so reduce traffic and ensure smooth gameplay. In MMORPGs players can choose to be organised in guilds. Guilds are often extensive social networks with set hierarchy structures to which players share intimate connections (Nardi, 2010).

Gaming can also be a jumping board for more concrete political action. Jung (2020a) found that community involvement in the game community and sense of belonging was related to political participation for Korean gamers of Roleplaying Games and Augmented Reality games. The political action was not restricted to game matters (e.g., cut-off times in Korea) but participants were surveyed on activities such as attending

rallies or protests and signing petitions. Similarly, a study of LoL players in the US found that players of this game are more civically engaged than the previous generation, when it comes to peaceful protest (Stokes & Williams, 2018). The authors argue that games have similar expressive qualities. Although this expressive form or protest might be more of a generational conflict, the fear that playing games reduces civic participation is dispelled by this study.

SUMMARY

- Games are communities in themselves that people can identify with
- People use game environments to provide safe spaces for marginalised groups
- There is some evidence that people who play more community-minded games are more involved in civic participation, but this might be culturally defined.

E-sports in school to improve school climate

Given recent insights that games may function as a playground to improve children's social skills and wellbeing (see above), e-sports programs in schools could be useful in supporting student relationships. While the benefits of having an esports program in school is still a largely unexplored territory, esports in school might foster opportunities for students to increase students' fitness, let them discover new roles, improve their cognitive skills, and let them experience a sense of belonging (Shum, H. L., Lee, C. H., & Cheung, J. C. S., 2021).

A mixed-method study into a high school with an esports program found that those students who were involved in the program engaged in both game and non-game related activities with other students in the program during lunch and recess (Fiskaali, Lieberoth & Spindler, 2020). No significant differences were found between esportsers and regular students (including gamers) for variables such as wellbeing, self-efficacy, and loneliness. Observations indicated that students who were in the program also seemed to bond inside and outside of school. In another study, teachers supervising the esports program, found that participants improved in domains like "self-management, social awareness, relationship skills, and responsible decision making" (Cho et al. 2019).

Universities, especially in the US, are increasingly setting up scholarships for new gaming talent (Keiper et al., 2017). This may offer future opportunities for those students who don't qualify for traditional sporting scholarships. In the US, for instance, students of Asian descent might benefit from more game scholarship programs, as they are now underrepresented in academic sport leagues.

SUMMARY

- Teachers have reported that esports in school improves students' social skills
- There is no evidence that esports programs in school is detrimental to students' wellbeing
- Esports programs can create a sense of belonging in school and help to create social bonds within schools
- There are increasing opportunities for scholarships (mostly in the US) for students who excel at certain games

B. CAREER PROSPECTS FOR RECREATIONAL GAMERS

Gaming can offer opportunities for young people to find fulfilling and lucrative careers. Below we will discuss three main branches of career development that are directly related to recreational gaming: e-sports, streaming and game production. While we will focus on the Australian context, studies from other countries (both Western and Eastern) are used to offer a deeper understanding of this global industry.

E-sports Careers

While esports is still in its infancy, potential employment opportunities for young people related to this new form of entertainment are rapidly increasing, especially in the United States (Anderson et al. 2018), China (Yu, 2018) and South-Korea (Dal-Jong, 2020) with global revenues prediction to surpass the one billion US Dollar mark this year (Soto Reyes, 2021). In Australia the esports industry can be said to be still in its infancy, with an annual revenue of 5 million Australian Dollars in 2019, making it comparable to other 'midsize' players, like Brazil and Spain (PwC, 2020). Australia's remote geographical location has been cited as a disadvantage regarding internet latency (Carter et al. 2017). On the other hand, in 2016, 1.5 million Australians are estimated to be esports fans (NBN, 2017) and some AFL teams have acquired e-sport teams, indicating a professionalisation of the field (Gibbs et al. 2018). The COVID19 pandemic has also created new branding opportunities for sports clubs with athletes shifting from physical sports to online game tournaments (Goldman and Hedlund, 2020; Ke & Wagner, 2020). Scholars investigating e-sport expect that the market of esports will continue to increase in the future (Kim et al., 2020).

It has to be noted that, like any other professional sport career, esports careers are only reserved for those with the required talent and dedication and they have a generally short-life span (Jonhson & Woodstock, 2019). Pursuing an e-sport career, however, can have its advantages as esportsers, even on amateur level, acquire much looked-after skills, such as communication, teamwork, and problem-solving (Rothwel and Schaffer, 2019). According to Anderson and colleagues (2018) esports can be a gateway to Stem

Entrepreneurship that can function as a preparation for stem-oriented careers in data science, software development, marketing, and communication.

STEM ENTREPRENEURSHIP

“This STEM Entrepreneurship is a body of knowledge and skills that connect to high tech sector jobs not only in the games industry but also in data science, software and web development, social media marketing, and event organizing. The fandom community also contributes significant intellectual and production work that ties to academic standards and actual futures in the high-tech workforce.”

- Anderson et al. (2018)

Furthermore, the esports sector itself offers a rich diversity of job opportunities, not restricted to those who compete professionally. Jobs can be categorized in four domains: content creation, strategy, organisation, and entrepreneurial activities (Anderson et al. 2018). Content creation covers a diverse group of functions from streamers (see section below) to shoutcasters and journalists. On the organisational spectrum there are roles for team managers, event organisers and IT support. Strategists can be found in coaches and analysts. Lastly, there are several entrepreneurial activities around esports, ranging from web development to corporate sponsorship.

SUMMARY

- Like any other branch of professional sport, professional esports careers are only accessible to the top of the pyramid and they are usually short-lived
- There are many jobs around esports (paid and unpaid) available to gamers, such as shoutcaster, journalist or streamer
- Being involved in esports can stimulate young people to be involved in STEM-related career pathways, such as data science and software development
- People who are active in esports, albeit on amateur level, will develop soft skills

Streaming Careers

Considering price money and sponsorship deals are only for those who are on the top of the pyramid (Jonhson & Woodstock, 2021). Twitch can provide a lucrative platform for streamers and sometimes even leads into fulfilling full-time careers, but competition is tough (e.g., long hours, competition, but own boss) (Johnson & Woodstock, 2019b). In the aforementioned study, the following routes into streaming were identified among professional streamers (those making part of all their living through streaming): (1) some have a background in esports, e.g., shoutcaster (2) some find their way through other platforms (e.g., YouTube and Reddit) and (3) some started with other game-related activities (e.g., blogging or modding).

MODDING

Modding stems from 'modification'. Players sometimes deliberately change elements of the game software and make these modifications available to other players; something which is tolerated and sometimes actively supported by the game developers (Ito & Bittanti, 2010). Examples of mods include changing aesthetical elements of the game or creating *add-ons* that keep track of the player's performance. In *World of Warcraft* (2004), for instance, an add-on monitors how much damage each player has afflicted upon an enemy.

Streamers are entrepreneurs and need to find effective ways to monetize their labour: they don't only receive income from subscriptions, but also from donations, advertisement (e.g., tie-ins), sponsorship and gamification (Johnson and Woodstock, 2019a). While the gaming community (and streaming in its wake) have not always been inclusive of women (Madden et al., 2021) and other minorities (Fletcher, 2020), Twitch can offer economic inclusivity and empowerment for people with chronic health conditions who normally do not have equal access to the labour market (Johnson, 2019).

SUMMARY

- There is considerable competition among streamers. Aspiring streamers have to be resourceful in order to make streaming into a full-time career.
- Streaming can offer career pathways for people with unequal access to the labour market, like people with disabilities

Game Industry Careers

Australia has a relatively small gaming industry even compared to other small countries (Kerr, 2017: p. 100). Most mid-sized companies disappeared due to the GFC in 2008, leaving a sector of largely small independent firms where sociality and informality is the norm (Keogh, 2021). In the 2021 budget the Federal Government has included a 30 percent tax offset for game developers in a bid to boost Australia's gaming industry (Commonwealth of Australia, 2021). On a local level, there are several initiatives. The South Australian government, for instance, offers a 10 percent tax rebate for projects over 250,000 dollars (Southern Australian Film Corporation). Currently Victoria is still the largest player in the field: almost half of the jobs in the industry are concentrated in this state (IGEA, 2021).

With a relatively small gaming sector of around 1,250 employees (IGEA, 2021) job opportunities are scarce. That does not mean that game design does not create opportunities for children and young people. For instance, game design in school promotes inclusiveness, as it offers an acceptable pathway for girls into IT

careers (Wong & Kemp, 2018). Moreover, game design in schools fosters 21st century skills (An, 2016) as well as computational skills (Leonard et al., 2016).

SUMMARY

- The gaming industry in Australia is relatively small, but federal and local governments have dressed up incentives to stimulate its growth
- Game-design in school curricula should not only be seen as promoting careers in the game industry but also as a way to develop 21st century and computational skills

C. SOFT SKILLS FOSTERED BY RECREATIONAL GAMING

Games have attracted the interest of educators for decades (e.g., Kraus, 1981). The use of commercial games in educational curricula have been widely studied (e.g., Peterson, 2012; Beavis et al., 2017). At the same time recreational gaming is said to enhance cognitive skills including spatial awareness and processing speed (Pallavicini et al., 2018). More recently serious games have shown to be helpful in creating awareness of world issues, like climate change (Pollio et al., 2021). In this section we will focus on the research of the soft skills that are fostered by recreational gaming and esports.

21st Century Skills

21st Century skills are defined differently depending on the framework, but mostly include skills that allow students to be ready for the globalised and digital world, such as collaboration, digital literacy, social skills, and citizenship (Voogt & Roblin, 2010). Young adults (14-19) have self-reported that they have acquired skills like entrepreneurship, creativity, time and money management, critical thinking, teamwork and cooperation, persistence, motor skills and mental concentration (Matijević & Topolovčan, 2019). Kahila et al. (2020) analysed children's opinions on what they learn from games specifically in the light of 21st century skills. They categorised their answers in the following domains: strategic learning and self-regulatory skills, creativity, problem-solving and decision-making skills, concentration skills and social skills. Based on the current body of research we will focus below on the following skills: teamwork, leadership, planning, persistence, creativity, self-regulation, communication skills and academic interest.

Teamwork

Unmistakingly multiplayer games require some form of teamwork. However, evidence of how collaborative skills might transfer into other domains is rare. Recently, games have captured the interest of corporate managers to increase teamwork. An experiment with a collaborative geolocation task showed that participants who played a collaborative video game in between the two tasks increased their performance the second time, while there was no significant result for the control group and traditional goal training (Keith et al. 2018). Furthermore, the video game also increased self-reported goal commitment and team cohesion. Another phenomenon in the corporate world is "stealth assessment" (Simons et al., 2020): using games to measure

competences such as teamwork and leadership skills. A study from the University of Melbourne showed how purposefully designed games can be used to measure collaboration (Scoular et al., 2017).

The way how a game is played might influence teamwork skills gained from it. In an experiment middle school students were asked to play the First-Person Shooter Call of Duty: Modern Warfare 3 (2011) for two hours, before being subjected to the Prisoner's Dilemma game (Badatala et al. 2016). Those who played the game in competitive mode were less likely to perform well on the task, whereas those who played in collaborative mode performed significantly better than the control group.

FIRST PERSON SHOOTER (CALL OF DUTY)

A First-Person Shooter (or *FPS*) is a game in which a player controls an avatar in a war setting. FPS try to simulate real-life combat situations by giving the player the impression that they are in the middle of the action. One of the more popular FPS is the *Call of Duty* series (2003) that often involves historic combat situations. (Image: Activision)



Leadership skills

Like teamwork, studies about the transferability of leadership skills from games are rare. However, large online multiplayer games, in which players are often organised in guilds, require some necessary leadership skills from those who have leading positions in those guilds (Milik, 2017). In a 2014 study, Lu et al. (2014) found a correlation between people's social circles and activities in an MMOG and their role in voluntary organisations. A similar correlation with corporate positions couldn't be found. In a more recent study, game achievement and character identification in MMORPGs were a mediating factor for self-reported offline leadership "experience" (Lee et al., 2019). This includes skills or abilities like emotional intelligence, trusted influence and systems thinking.

Creativity and problem-solving

Some games may require more creativity from its players than others. Sand-box games, like Minecraft are often cited to stimulate creativity. Indeed, Blanco-Herrera et al. (2019), found that playing Minecraft without direction increased creativity on three commonly used creativity indexes. Another study found that puzzle games are significantly correlated with creative thinking, compared to shooter games and sandbox-games (Moffat et al., 2017). While Moffat and colleagues hypothesised that action games would not be beneficial to creativity, their results indicate that they do influence flexibility as one of the three components of creativity.

SANDBOX GAMES (*MINECRAFT*)

Sandbox games are characterised by their open structure and apparent lack of explicit rules (Gee, 2003). They allow players to explore and be creative, for instance by building structures. Minecraft is a sandbox game that has proved to be very popular today with children and young people and has been found useful in educational settings (Nebel et al., 2016). Minecraft has a deliberately defunct aesthetic feel, in which pixels are clearly visible.



Some see problem-solving as an integral part of creativity (Hall et al. 2020). Hollis et al. (2016) let their participants play a First-Person Shooter and a strategic game. Both increased problem-solving capacities on the post-test, along with an increase in working memory and visuo-spatial skills. MMORPGs have also shown to rely on players' problem-solving skills. In an ethnographic study, Jamaludin and Hung (2017) describe the problem-solving trajectory of a 14-year-old World of Warcraft player as he has to navigate the game-mechanics and social conflicts that he encounters on his journey to level up his character.

STRATEGY GAMES (*CIVILIZATION*)

In strategy games the player often has a “God perspective” over the game and the control over many in-game elements, from construction to the movement of game characters. The strategy element relates to the planning and preparation that is required to advance in the game, for instance by managing resources. In the *Civilization* (1991) series, players can pick an historic civilisation and expand its empire by building cities, colonising land, and engaging in diplomacy with other nations. (Image: Firaxis Games)



Persistence and failure

Game scholar Jesper Juul has extensively studied the paradox of failure that he sees represented in games: failure can cause unpleasant feelings, but we actively choose to have these feelings of failing when we are playing video games (Juul, 2013). Failure in games matters less, because they are not embedded in the real world, although they can cause equally strong emotions. This raises the question if games can help us to train persistence. A recent study did not find any significant correlation between playing video games and mastery orientation, or the will to succeed (Anderson et al. 2019). However, those who considered the aspect of challenge to be important in games, did show higher levels of mastery orientation.

Self-regulation and planning

While games are often blamed for tricking gamers into losing sense of self-control (Zendle, 2019), they can effectively be helpful in fostering self-regulation. One study found that playing strategy games was positively correlated with real life self-regulation (Gabbadini and Greitemeyer, 2017). Self-regulation here refers to concepts such as goal setting and dedication. For other genres, such as puzzle games and action games, no correlation was found. Similarly, a master thesis found that players of MOBA games reported higher measures of self-regulation compared to the control group (McMahan, 2019). Emotion self-

regulation is also one of the reported benefits among professional esports players (Carbonie, A., Guo, Z., & Cahalane, M., 2018).

MOBA (LEAGUE OF LEGENDS)

Stands for Multiplayer Online Battle Arena. These games center around short matches that can be played on a predefined map. Players play in a small team against another team. Before each match they can choose a specific character and by doing so they have to take into account the character qualities in relation to their teammates and their enemies (Stokes & Williams, 2015). *League of Legends* (2009) is one of the most popular MOBAs: players compete on professional level in an esports league (Johnson & Woodstock, 2021). (Image: Riot Games)



Besides self-regulation, planning has been linked to playing (strategic) games. Simons et al. (2021) investigated how the game Civilization could be used to assess potential job applicants' leadership skills. In the study achievement in the game correlated with participants' performances on role-playing assessment for two variables: (1) planning and organisation and (2) problem-solving.

Communication skills

Especially multiplayer games require communication skills. That's why they have been the extensive focus on their influence on foreign language learning (e.g., Rama et al., 2012). A more recent study focused on the stress reducing incentives that games might offer while speaking English as a Second Language (ESL) (Soyoo & Mclay, 2019). The Iranian high school students who participated in this study benefited from less anxiety compared to the control group, by playing Grand Theft Auto: Chinatown Wars (2009), a single player game, and then discussing it in a chat group. Replicating previous studies, Horowitz (2019) found that playing MMORPGs was directly related to Spanish Speakers willingness to communicate in English.

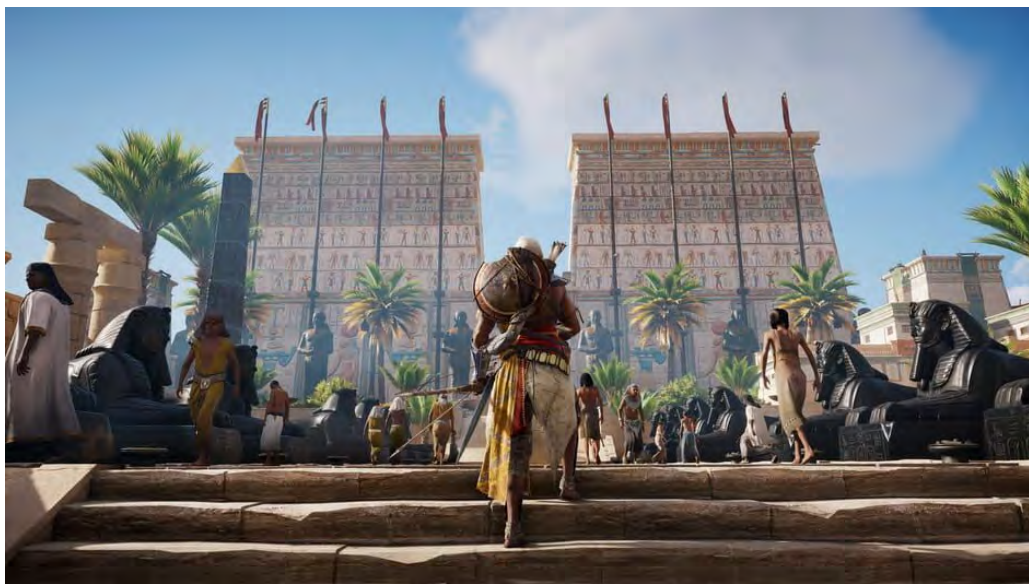
Improving the willingness to communicate in English for foreign language speakers is especially relevant for multicultural societies such as Australia, but gameplay and esports could also improve communicative skills for native speakers (Anderson et al., 2018). Barr (2017) studied the communication skills of undergrad students after collaborative gameplay for 8 weeks. Self-reported communicative adaptability (“being able to perceive” and “being able to adapt”) improved significantly on the post-test compared to the control group.

Academic interest

Games can trigger an interest in academic subjects. Famous examples include Kurt Squire’s studies into his use of Civilization in the history classroom (Squire, 2004). Indeed history, being a popular subject of many games, is often cited to be a trigger for students developing historical interest and awareness. More recent studies have shown that students feel a sense of “immediate access to history” when playing the game Assassin’s Creed (Gilbert, 2019). Indeed, some educators have found it useful to use games with a historic theme in the history classroom (McCall, 2016).

ASSASSIN’S CREED

The *Assassin’s Creed* (2007) series are single role-playing games set against an historic backdrop, often involving real historical cities, in which the player has to move around carefully in order not to be detected by enemies. (Image: Ubisoft)



Another study found that games could spark people’s interest in learning foreign languages (Chik, 2014). One of Chik’s Hong Kong-based participants took an interest in the Japanese language after being initiated to Japanese games by her brother. An Iranian study found that games increased Iranian student’s motivation to learn English (Ebrahimzadeh and Sepideh Alavi, 2019).

STEM is another subject that is often cited as being related to digital games. A recent study found that game experience predicted students’ attitudes towards STEM through the mediating variable of “computer self-efficacy” (Ball et al. 2020). Anderson et al. (2018) argued that esports might

invoke interest in STEM and help students develop a sense of “STEM entrepreneurship”. Lee et al. (2020) designed a STEM-curriculum around an esport program in school.

SUMMARY

- Young people and children have reported gaining 21st century skills from gaming
- Games can be used effectively to promote teamwork in companies
- Social networks in MMORPGs are correlated with people’s status in non-profit organisation
- Stealth assessment through games can be used to effectively predict planning and problem-solving skills
- First Person Shooters, strategy games and MMORPGS involve problem-solving skills that can be transferred to real life situation
- Sandbox games like Minecraft foster creativity
- Strategy games can foster self-regulation
- Games can improve communicative adaptability
- Games can increase the willingness to communicate in foreign languages (mostly English as a Second Language)
- Games can evoke interest in academic subjects, such as STEM, history, and foreign languages

SCOPE AND LIMITATIONS

In this literature review we have focused on the most recent academic literature (publications from 2016 and onwards). In doing so, we want to highlight the latest thoughts and directions in the academic literature concerning the benefits of recreational games and esports. We have also included some older studies as they were necessary to show development of a certain field or topic of study; or if a more recent source couldn’t be found. An effort has been made to include studies undertaken in an Australian context, but most studies come from a variety of countries, with US-based studies taking the largest share. When it comes to job opportunities, we have selected the most recent publications by Australian institutions and organisations, like the Interactive Games and Entertainment Association, PWC and NBN. Occasionally we have selected a PhD or a Master-thesis, if they could shed more light on a topic that has up to now attracted very little attention from scholars.

It has to be noted that a literature review such as this one is never exhaustive. Literature has been selected based on its focus on benefits and the link to recreational gaming and esports. Especially the esports literature is still in its infancy, which accounts for a limited account of its benefits. Other perceived benefits related to gaming, like problem-solving skills, have been widely theorised but less extensively studied (Adachi & Willoughby, 2013). Scholars have also shifted their interest from commercial games to other domains, such as serious games and gamification (Baptista & Oliveira, 2019) which makes the evidence-base of the last five year relatively small.

Another limitation to this review, is that not all studies have focused explicitly on young people and children. Where this is the case, we have explicitly mentioned it. That is not to say that benefits encountered by the adult population cannot equally apply to young people.

CONCLUSION

While games have been chastised for their alleged dangers, such as addiction violence and depression, players have reported gaining benefits from games with regards to wellbeing, social networks, community building and soft skills. Soft skills that were related to the games investigated in the studies reviewed above include teamwork, leadership, creativity, problem-solving, persistence, self-regulation, planning and communication skills. Some of these skills are highly valued by potential employers. Furthermore, the gaming industry, although small in Australia, offers satisfactory career pathways for those who are interested in digital games. But also, academically students might benefit from games. Commercial games have been successfully used in education to motivate students, but some games may also motivate students to take up subjects such as foreign languages, history, and STEM.

Esports is increasingly popular in Australia, both on amateur and professional level. Esport programs in school can offer extracurricular activities to those who are not normally involved in school life. Esport creates opportunities for friendship and bonding. It may also offer connections to, in particular, the STEM curriculum. There are also career opportunities for young people interested in esports, from professional gamer to streamer or shoutcaster. More government investment is needed, however, to legitimise gaming as a sporting practise comparable to football to engage children and young people in this new branch of sport (Kim et al. 2020).

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