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**ADDICTION TO DIGITAL GAMES ON
LOWER SECONDARY SCHOOL PUPILS**

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DECLARATION

I hereby declare that I elaborated this bachelor thesis independently under the supervision of Mgr. Michal Mrázek, Ph.D., using only information sources referred to in the literature chapter.

Olomouc 2. 6. 2021

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Podpis

ACKNOWLEDGMENT

I would like to thank my supervisor Mgr. Michal Mrázek, Ph.D. for his professional help, patience, and valuable input. I would also like to thank my family, who supported me during my studies.

Anotace

AKRITIDU, E., Závislost na digitální hry na studenty druhého stupně, Olomouc: Pedagogická fakulta Univerzity Palackého, 2010.

Bakalářská práce je zaměřena na problematiku závislosti na digitální hry. Cílovou skupinou byly žáci druhého stupně základních škol. Práce je rozdělena do dvou hlavních částí, na část teoretickou a praktickou. Teoretická část je představena prostřednictvím zpracování poznatků z odborné literatury, pro hlubší pochopení problematiky. Praktická část se pak věnuje výzkumu, který byl proveden metodou dotazníku. Tato práce si klade za cíl sjednotit dostupné informace o problematice závislosti na počítačových hrách u žaku. Cíl bakalářské práce se neomezuje pouze na vyhodnocení výsledku dotazníkového vyšetření ale i na hodnocení jeho jednotlivých otázek.

Klíčová slova

závislost, digitální hry, základní škola, žaky, dotazník

Annotation

AKRITIDU, E., Addiction to digital games on lower secondary school students, Olomouc: Faculty of education Palacky University, 2020.

The bachelor work focuses on the issue of addiction to digital games. The target group were secondary school pupils. The work is divided into two main parts, the theoretical and practical part. The theoretical part is introduced through processing finding from professional literature, for a deeper understanding of the issue. The practical part is then devoted to research, which was carried out using the method of a questionnaire. This work pursues to unify the available information on the issue of addiction to computer games in students. The aim of the bachelor thesis is not limited to the evaluation of the result of the questionnaire examination but also the evaluation of its individual questions.

Key words

addiction, digital games, lower secondary school, pupils, questionnaire

Contents

Introduction	7
I. Theoretical part	8
1. Digital games	8
1.1 Types of digital games	9
2. Usage of digital games in lower secondary school	13
3. Addiction to digital games	16
3.1 Risks	19
3.2 Prevention	21
II. Practical part	22
4. Methodology of research	22
4.1 Research problem	22
4.2 Research	23
4.3 Questionnaire	24
5. Results and Discussion	25
5.1 Criteria	25
5.2 Results	26
6. Conclusion	33
Literature	36
List of images	39
List of tables	40

Introduction

The use of digital games in teaching is nothing new to us, yet in an educational environment, it is a tool that is not usually utilized. The usage of digital games in lower secondary schools is a relatively unexplored area that deserves more space than it is given. Playing digital games can be used as an excellent way for simultaneously learning and entertainment.

Although digital games can be used as a method of teaching, they are currently mostly used for entertainment. Nowadays, with COVID-19 in duration, playing digital games has become a great excuse for pupils to stay at home, as a recommendation from the government. Considering all the changes happening this year, the risk of forming an emotional disorder is higher. Pupils are much more likely to get addicted to digital gaming, given the factor that gaming is often used as a stress reliever. Some of the consequences of addiction to digital gaming are difficulties at school, the inability to focus or procrastination. This can cause complications in a child's life which lead to lower grades, miss out on socializing opportunities, or even lose interest in physical exercise altogether.

I chose this topic for my bachelor thesis because many of my friends have a digital gaming addiction. I was concerned about how serious this addiction can be and what are the indicators of addiction to it. Also, as a future lower secondary school teacher, I would like to reveal the seriousness of this matter and take it into consideration when teaching. Knowing the gravity of the matter I will be more adequate with using digital games in class or using it as a technic of teaching.

In this bachelor thesis, I am interested in lower secondary school pupils. Thus, I will unify information about digital games and addiction while also explaining the risks and how to prevent addiction to digital games from happening.

In the practical part of the thesis, I will be researching whether the usage of digital games in schools is a risk, by investigating the number of pupils who are addicted to them. With the help of a questionnaire, I will be able to analyse how many of the pupils tend to get addicted to digital games. While creating the questionnaire needed for the research, I will emphasise on the criteria which a digital gaming addiction questionnaire should have. In addition, I will be explaining the importance of each question I have chosen in the questionnaire while illustrating which criteria it fulfils and its results.

I. Theoretical part

1. Digital games

Digital games can be characterized by numerous definitions. A digital game is a particular type of software, which is built to interact with its user. These games are designed for entertainment and enjoyment, they must have an established goal, which has to be achieved at the end of the game. Digital games are played using digital technology for instance on consoles and computers. Due to the existence of multiple digital media designed for gaming the definition of digital games has become a synonym to a range of terms, for example, computer games, electronic games, and video games.

A game can be defined as digital, based on six characteristics leading to the gamer's involvement (Prensky, 2001). These are the following characteristics:

- The rules of the game,
- the aims of the game,
- the result and its feedback,
- the element of conflict/competition/challenge/rivalry,
- the element of interaction,
- the representation of a story or plot.

Digital games have preset rules and limitations that guide the player toward a specific goal, which is often described as a challenge. Such games' features engage with the player frequently, offering feedback either by scoring or by improvements to the game's environment, allowing players to keep track of their progress and improve their skills while overcoming various obstacles while gaming.

Digital games are also a great instrument that can be used on lower secondary school pupils. They are useful tools for learning specific strategies and gaining knowledge; they also encourage the type of learning that is characteristic of the information society's culture, and this learning is likely to have long-term impacts. Digital games can be used to teach a particular subject, but they can also leave an impression on the pupils as well. (Gros, 2007)

1.1 Types of digital games

Digital games can be sorted out into various categories. The categories, which are going to be mentioned, can also have subcategories. All categories are connected in one or more ways. By broaching the subject of types of digital games we can improve our understanding of how the different categories are connected with each other.

The first categorization of digital games is by the number of players playing the game. If the game is played by one player then it's called singleplayer. If more than one player is playing, then the game is classified as multiplayer. (Basler, Mrázek 2018) (Translated by the author)

Digital games can be categorized by the type of settings the game is played. A game could be played in an academic setting, where the aim is on learning. Social settings aim at the ability of teamwork. Contrarily solitary setting focus on strategy.

Digital games can be sorted by what device the game is played on. In this category, we can find the following devices: (LENHART, 2008)

- Computer (PC, notebook).
- Gaming console (PlayStation, Xbox, Wii).
- Cellphone.
- Handheld gaming devices (PSP, Nintendo DS systems).

Digital games are also divided into online digital games, which demand an internet connection, and offline digital games, which do not require internet access. (Basler, Mrázek 2018) (Translated by the author)

Genres of digital games according to Arsenault (2009) have remained under-theorized through the years due to their unproblematic nature. We can come across various genres of digital games, but Rehbein et al. (2016), made one of the most detailed and understandable genre table of digital games, where they explain the genres and their subgenres with examples for each one. The model is illustrated in table 1.

Digital Game Genres		
Genre	Subgenre	Example
Cognitive - skill	Card games	<i>Solitaire</i>
	Puzzle games	<i>Tetris</i>
	Digital board games	<i>Scrabble</i>
	Quiz games	<i>Quizduell</i>
	Skill games	<i>Fruit Ninja</i>
	Fitness games	<i>Wii Cardio Workout</i>
	Music games	<i>Guitar Hero</i>
	Party games	<i>Mario Party</i>
	Hidden object games	<i>Mystery Estate</i>
Sports	Sports games	<i>FIFA</i>
Driving	Driving games	<i>Need for Speed</i>
Simulation	Simulation and construction	<i>The Settlers</i>
	Life simulation	<i>The Sims</i>
	Business simulation	<i>Sim City</i>
	Sandbox	<i>Minecraft</i>
	Flying simulation	<i>World of Warplanes</i>
Action and adventure	Action adventure	<i>Assassin's Creed</i>
	Jump'n'Run	<i>Super Mario</i>
	Adventure	<i>Professor Layton</i>
	Action games	<i>Trine</i>
	Survival Horror	<i>The Last of Us</i>
	Arcade	<i>Pacman</i>
	Beat'em up	<i>Naruto Ultimate Ninja Storm</i>
Shooting	First-person shooter	<i>Call of Duty</i>
	Third-person shooter	<i>Lost Planet</i>
	Shoot 'em up	<i>Moorhuhn</i>
Strategy	Strategy games	<i>Plants vs. Zombies</i>
	Real time strategy	<i>Starcraft</i>

RPG	RPG	<i>Final Fantasy</i>
	Action RPG	<i>Secret of Evermore</i>
	MMORPG	<i>World of Warcraft</i>

Table 1: Model of game genres (freely modified from Rehbein et al., 2016)

Cognitive – skill

A cognitive game is a genre of digital games in which players privately select information structures and then play an arbitrary, normal or extensive form game under the resulting information structures (Tirole 2015). Skill games’ outcome is determined by mental or physical skill rather than a chance for instance chess.

Sports

A sports game is a digital game genre that simulates the practice of sports. The games focus on a realistic recreation of sports, which is simplified in order to be more controllable for the player for example *FIFA*.

Driving

The basic principle of these digital games is to get to the finish line first. The vehicle in the game is usually controlled using a keyboard depending on the device used for playing the game (steering wheel, gamepad, cellphone, joystick). The player has to control it correctly enough, to finish the line before the other opponents, for instance in *Need for Speed*. (Basler, Mrázek 2018) (Translated by the author)

Simulation

A simulation game is a genre of games that are designed to attempt to copy real-life scenarios and activities. One of the simulation games subgenres is Sandbox or also known as open–world, which is a style of game in where the player has minimal limitations and the game emphasizes on letting the player roam and select tasks, for example, *Minecraft*. Flying simulation is a virtual reality game capable of simulating the environment of a flying machine (Techopedia 2015). A life simulation game is also considered a subgenre of simulation digital games. These games focus on individuals and relationships or on simulating an ecosystem.

Action and adventure

Action games are very popular digital games, where the basic principle is to neutralize the enemy. This genre emphasizes physical challenges, such as hand-eye coordination and reaction time. The player character usually navigates a level, collects objects, avoids obstacles, and battles enemies while using their natural skills as well as tools, which the player has at his disposal. Arcade games are easily recognizable by the short levels, which rapidly increase in difficulty with simple and intuitive controls (Techopedia 2011b).

Adventure games are a genre that emphasizes on unravelling stories and exploring worlds. Adventure games also focus on puzzle solving within a narrative framework. Survival horror is a subgenre of digital games in which a protagonist has to escape and survive a horrific and violent environment. These games aim is to create an atmosphere similar to that of a horror film. (Lexico 2021)

Strategy

The basic requirement for these digital games is critical thinking. The player has certain virtual inputs for instance the territory he is given, which he must take care of and develop. There are usually opponents on the game map and the player with the best development strategy wins the game (Basler, Mrázek 2018) (Translated by the author). Strategy games have a subgenre named RTS, which stands for real-time strategy. These games are time-based and centre around using resources to build units and defeat an opponent. (Techopedia 2011a)

Shooting

Shooting games are divided into three subgenres. FPS (first person shooter) is a game that is played from the point of view of the protagonist. Third person shooter is a game in which the player character is visible on-screen during play. Shoot'em up is a subgenre game in which the protagonist shoots at a large number of enemies while he dodges their fire.

RPG (Role-playing game)

A role-playing game is a genre of digital game where the player controls the hero (main fictional character/s), who moves in an imaginary virtual world. The main goal is for the fictional character to undertake quests and successfully fulfil them while gaining new skills. In the RPG

genre, there are also included subgenres namely action RPG, which mainly focus on the combat aspects. The gamer usually controls a single character rather than a party for instance *Diablo*, *Zelda*. Another subgenre is MMORPG, which stands for Massively multiplayer online role-playing game. These are multiplayer games where large amounts of real-time players interact with each other in a shared virtual world for example *World of Warcraft*. (Techopedia 2011a)

2. Usage of digital games in lower secondary school

Traditional teaching's didactic model can be considered ineffective since it does not guarantee great learning outcomes. The current generation of students seems to be lacking in motivation and acceptable learning outcomes, as seen in the traditional educational system.

„Digital educational games create a new perspective in learning culture, which go hand in hand with the interests of the pupils. Digital educational games are an innovation in primary education that can enhance children learning and acquiring skills. The integration of digital educational games in the school environment of primary education could effectively contribute to reforming the educational system. Early childhood education and primary education teachers can play a crucial role in supporting children's digital game-based learning.“ (Manesis 2020)

Digital educational games are software programs that incorporate the features of both video games and computer-based games. They want to create enticing learning environments that are tailored to unique learning goals and outcomes. Digital educational games also take into consideration the desire and enthusiasm of students toward playing, while heartening the development of logical thinking and the addition of knowledge, abilities, and skills. They can awaken the interest of even the most demanding students by incorporating them into the learning process through practices that are different from the traditional didactic practices used in most schools.

Digital educational games are thought to be appealing because of their entertaining features, as well as their pleasant atmosphere and aesthetic value, (graphics, effects, music), the existence of a structured framework, their learning goals, as well as the presence of a game factor. Digital educational games are reckoned as contemporary learning tools and modern mediums of learning by bringing education to a new dimension. Digital games are an increasingly growing field nowadays since they are the most common technology in children's entertainment. At the same

time, digital games can be used as learning resources to enhance the efficiency of the learning process at all levels of education when properly developed and used in a pedagogically acceptable manner (Manesis 2020).

Didactic computer games support active learning. Didactic computer games can improve comprehension during learning while encouraging collaboration between students (Fenggen, 2008).

According to Ibrahim and Yamaya (2008) a good didactic computer game integrates up to 16 learning principles:

- Introduction: Pupils need virtual characters to complete a task, through which they play certain roles. That means the player should be represented as a character in the virtual world.
- Interaction: Optimal communication must be ensured so that it is possible to interact with the virtual environment, preferably also interaction with other players to fully develop the learning process.
- Production: The actions performed by the pupils must be following the story of the didactic computer game, which is a learning process.
- Risks: Games must encourage students to make decisions and prepare them to take risks.
- Specialization (adaptation): Games must be playable on different levels of difficulty so that students of different cognitive levels can play according to their abilities.
- Agent: Pupils should be able to empathize with the role they have chosen and control it to meet the requirements set by the didactic computer game.
- The proper solution of game problems: Problems that arise in the game should be solved by students properly.
- Challenges and reinforcements: A good didactic computer game offers several challenges and problems and allows students to solve them. At school, the problems often solved are too complicated for weaker students, while for good students they are trivial and cannot develop in this way, which we do not encounter this problem in didactic computer games due to specialization.

- Reasonable time and requirements: Textbooks are not always satisfactory, and some students may be averse to them. On the other hand, while playing didactic computer games are available if needed adequate information at a time that the student regulates himself.
- Meaningful situation: Didactic computer games should provide meaningful situations in terms of action, image, and dialogue.
- Losing: It is often difficult for students to overcome a loss, but failure in the form of a loss supports the improvement of abilities and skills that allow the student to return to the game and repeat their efforts.
- Thinking system: Games should encourage students to think about the relationships between facts, events, and skills.
- Exploration, lateral thinking and goal-oriented thinking: Through games, players should be encouraged to explore their choices, free themselves from ordinary thinking, and use lateral thinking to achieve a goal.
- Smart tools and knowledge dissemination: Tools used in computer games are considered smart devices, such as an avatar, that is intelligently programmed for moves and actions.
- Cooperation: Cooperative computer games are based on the performance of tasks by the joint efforts of individual teammates. The goal of didactic computer games is to support teamwork and the ability to solve problems between team members. Each player brings a specific benefit to the game based on his playing abilities and skills, in the context of the chosen specialization of the virtual character. However, the player should also be competent in the game to achieve goals regardless of the abilities of his teammates.
- Success for everyone: The game should use intelligent tools to allow every player to feel successful, even if they are rather low in the field.

According to the educational activity in individual subjects of teaching, teaching computer games can be divided according to the educational activity into the following fields (entertainment and didactic computer games are included): foreign languages (eg Lingua.Ly, Duolingo); Czech language (computer games with Czech localization); history (eg History Quiz, American Civil

War: Gettysburg, Total War Series, Assassin's Creed Series); geography (eg Geography Quiz); mathematics and physics (eg Portal, Adventures in Math, DragonBox, Physicus); social sciences (eg Europe 2045, SimCity, Tropico, Do I Have a Right? Executive Command, Counties Work); informatics (eg Hacker Evolution, Uplink, Lightbot, CodeMonkey, CodeCombat, CodinGame, CheckIO, Empire Of Code, Code Kingdoms, TIS-100, Screeps, Code Warriors); chemistry (eg Chemicus); biology (eg Spore); art and music (eg Sketch Guru, Guitar Hero, Rocksmith) (Basler, Mrázek, Chrbjác, 2018).

3. Addiction to digital games

„The present study showed that gaming addiction goes beyond mere high game exposure and some gamers may display personality patterns that are usually associated with substance addiction. Thus, while some game players can indeed be diagnosed as addicted in terms of pathological behavior, researchers need to be careful in whom are classified as addicted.“
(Marloes Spekman et al. 2013)

The general definition of addiction according to Nespov (2011) is of a group of physiological, behavioural, and cognitive phenomena in which the use of some substances or classes of substances have a much greater preference for an individual than others conduct that he once valued more. But it is clear that computer addiction peas are not a substance, but most of the symptoms are the same. Nespov further claims that there is no medical addiction to computer games. He states that the groups of substances that can cause addiction are precisely listed in the International Classification of Diseases. These include alcohol, opioids, cannabis, sedatives, cocaine, other stimulants, hallucinogens, tobacco, organic solvents, and other addictive substances. There are no computers or the Internet in the classification list. (Translated by the author)

Although we are not talking about substance abuse in digital games, we can notice that the manifestations of addiction are very similar.

Signs of addiction (freely modified from Nespov, 2011) (Translated by the author)

- strong desire (for playing digital games)
- difficulty controlling yourself (a lot of time spent on digital devices, weak will, loss of control, and not realizing one's own emotions)
- loss of social contact (with family, friends)

- gradual neglect of interests and hobbies (e.g. in favour of longer time spent on the digital, neglect of sports activities)
- an attempt to stop playing despite conscious problems becomes impossible in most cases (the individual continues to play)
- withdrawal symptoms (when the individual is not playing is nervous, irritable, with frequent mood swings)

At the same time, it states that if the following symptoms occur, the problem becomes serious.

Parents should be more careful if a child has:

- great fatigue
- problems with school and school
- loss of all interests
- isolation
- frequent irritation and aggression

If multiple symptoms appear at the same time, parents need to be careful and seek professional help.

Experts agreed on the fact that basically, every addiction consists of six basic symptoms (Vacek 2010) (Translated by the author). The first symptom is prominence when digital games become a very important point in an individual's life. Games gradually begin to affect his thinking (thinking about playing when we're not playing), feelings (desire to play) and behaviour (neglecting responsibilities). Another symptom is mood swings. When the desire is satisfied, the individual's mood changes (mostly positive). As addiction progresses, more and more tolerance for digital games increases, so the individual needs to spend more and more time satisfying the desire, which is, playing digital games. Withdrawal symptoms occur with every addiction when restlessness, stress, nervousness, or anger appear after the end of a satisfying activity. The penultimate symptom is a conflict (Klinika adiktologie, 2010) (Translated by the author), which can be of two types. Interpersonal conflict leads to neglect of duties and loved ones (quarrels with parents, loss of friends). Internal conflict leads to the division of the individual, who has difficulty deciding between playing digital games and other activities (he cannot decide whether to play a game or prepare for school or a partner). The last symptom is relapse, where the addict tends to

repeat his previous addictive behaviour with which he does not agree. He returns to playing digital games after a certain phase of rest. An individual is addicted if he has all the symptoms mentioned. From the list of symptoms, it is clear that addiction has a negative impact on an individual's life.

According to the American Psychiatric Association APA (2013), which published the Diagnostic and Statistical Manual of Mental Addictions DSM-5, the field of digital gaming is classified as an addiction to online digital games (Internet Gaming Disorder) in the Conditions for Further Study section. Therefore, according to DSM-5, it is still not classified as officially recognized dependencies. It is a permanent, repetitive playing of online digital games, often with other players. This area also includes offline digital games that do not require an internet connection.

According to APA (2013), there is a clinically proven dependence if an individual meets five or more of the following symptoms within one year:

- Engaged in digital games (thinking about previous or future gaming; playing digital games is becoming the dominant activity of life).
- Withdrawal symptoms when the individual does not have access to play (typical symptoms are irritability, anxiety, stress, or sadness, but there are no physical symptoms of addiction).
- Tolerance when it needs to meet the need to play digital games the individual more and more time.
- Repeated unsuccessful attempts to control or interrupt gameplay.
- Loss of past interests, hobbies and spending free time playing digital games.
- Continuing to play digital games despite knowledge of psychosocial problems.
- Lying to those around him (family, friends) about the level of playing digital games.
- Using digital gaming as a means of escaping problems or getting rid of negative feelings (feelings of helplessness, guilt, anxiety, or depression).
- Endangering or losing close relationships, employment, education, or career opportunities due to digital gaming.

As reported in the same document by APA, we have three degrees of dependence: mild, moderate, or severe, which are based on the degree of disruption to normal activities. Individuals with a mild degree of addiction may have fewer symptoms and fewer negative effects on their

lives. Conversely, individuals with severe addiction will play much more often and will experience all the negative effects of addiction in their daily lives. Individuals who are addicted typically spend 8-10 hours (or more) per day and at least 30 hours per week on a digital device. As we can see, this is a large amount of time, which is why the correct daily cycle is often disrupted, and individuals often neglect sleep and eating due to computer gaming. There is also often a lack of personal hygiene.

As stated by Wood (2008) game addiction is often perceived as similar to gambling addiction. Wood also proclaims that gambling addiction and its negative outcomes are closely connected to losing or winning money while the use of digital games not usually involve the threat of losing a large amount of money and ensuing problems that loss may precipitate. Wood criticised the use of the term “addiction” to describe excessive gameplay because in his view excessive players do not play digital games due to addiction but as a means of escaping from real world problems. Therefore, what some consider addictive digital gameplay behaviour might only be a marker of difficulties dealing with unrelated “real world” life circumstances.

3.1 Risks

The discussion about digital games and their potential negative influence on young adults seems never-ending among media and researchers. According to Kneer’s et al. (2014) research so far there have been identified several potential risk factors among social settings, traits, and playing motives.

The questions asked in Kneer’s research concerned digital game addiction. Participants were asked to name factors that could support or inhibit digital game addiction. Answers were assigned into the following categories: playing motives, social settings, and traits. In addition, answers for supporting and inhibiting playing motives, traits, and social settings were counted.

Risk factors named by players		Risk factors named by counsellors	
Motives	Social interaction	Motives	Social interaction
	Achievement		Achievement
	Immersion		Immersion
Traits	Low self-esteem/high self-esteem	Traits	Anxiety

	Introversion/extraversion		Introversion
	Not conscientious/conscientious		Other psychological problems
	Emotional instability/stability		Low self-esteem
	Social skills/lack of social skills		Weak (other) coping strategies
	Openness to experience		Depression
	Narcissism		Attention deficit hyperactivity disorder
	Anxiety		Social phobia
	Aggression		Low impulse control
Social settings	No friends/friends	Social settings	Bad social ties in general
	Good/bad family background		No friends
	Good/bad social ties in general		Family problems
	Bullying/no bullying		
	Being single/having a mate		
Further conditions	Nothing else to do/other hobbies	Further conditions	Availability of digital games
	Unemployed/work or school		Psychological trauma
	Being younger/being older		Game-related conditions
	No/constrictions on playing hours		Stress
	Having stress/no stress		Nothing else to do
	Not/having self-reflection		
	Lower/higher income		
	Failure/success		
	Not/receive acceptance		

Table 2: Risk factors named by players and counsellors

All 28 participants acknowledged the existence of problematic playing behaviour, and only one player did not know any addictive players. Nevertheless, all players were aware of addictive playing behaviour, and all were able to name risk factors as well as inhibiting circumstances.

Counsellors pointed towards the role of anxiety, introversion, and other psychological problems such as depression, social phobia, or anxiety attacks. Kneer says that in their role of being an expert, the counsellors of course named specific psychological diseases contributing to addictive behaviours in general, such as a social phobia or ADHD. Counsellors also named real life problems as risk factors such as bad social ties, no friends or family problems. A counsellor who was part of this research said: *“My experience shows that addicted players showed striking personality traits such as the tendency to be anxious-avoidant or a low self-esteem even before developing a problematic behavior concerning the usage of digital games.”* And another counsellor mentioned: *“Digital game players or online addicts are often very introverted, sometimes even phobic concerning contact with other people and that might be something that can foster addiction”* Players and counsellors have a high level of awareness of digital game addiction and its risk factors, which are closely related to results of recent research in this area. The most important risk factors mentioned in Kneer’s research were lack of social life, low self-esteem, and immersion. It appears that the quality of social life is seen as a key factor in determining whether or not a player is engaging in healthy or unhealthy behaviour. If real-life social interaction is sorely missing, digital games provide the ideal coping strategy for dealing with real-life issues (Kneer’s et al 2014).

3.2 Prevention

“First of all, parents should set a clear time limit for online gaming. The amount of time devoted to an online platform use must be limited by parents exclusively. Moreover, parents should provide their children with occupation alternatives like chances to communicate with their friends or new interests like driving lessons.” (Nikos Zygouris et al. 2014)

Prevention is a great solution against digital gaming addiction in children and parents play a major role in this process. Digital game addiction can be prevented with the support of the parents. Lee and Morgan mention suggestions, which if followed they could prevent gaming addiction. When using gaming devices, children need adult attention, supervision, and direction. Therefore, parents should monitor their children. Parents should find extracurricular learning and

sports activities for their children before they develop an excessive interest in digital games. Parents need to help their children succeed socially by encouraging them to spend more time with their real-life friends before playing digital games. When children have no friends to socialize with, they seek other ways to connect with others, such as through digital games. In addition, parents must be mindful of which PC parlours their children visit, as well as keep track of the games their children usually play and the number of hours they spend doing so. Finally, parents need to be aware of the symptoms of a gaming addiction so that they can seek professional help for their children if necessary. (Lee, Morgan 2018)

If parents want to prevent the development of unwanted behaviour in children and adolescents, they should:

- support their child in social ties (with their friends and adults)
- strengthen the child's self-confidence within healthy limits
- do things together (talk about the game and have an overview of what the child is doing, or participate in the game)
- spend free time with children (to support children in other activities and interests)
- lay down appropriate rules concerning the time spent on the digital device
- recognize early warning signals
- let children play digital games in a location, where they can be supervised

II. Practical part

4. Methodology of research

4.1 Research problem

In the last year, there has been a worldwide pandemic of COVID-19, which has affected the daily lives of the population on earth. The Czech Republic was no exception, where many measures were taken. This led to a higher retention rate of individuals in homes and the use of digital technologies for work and school needs. It can be assumed that the use of digital technologies has been also increased, ascribe to children playing games in their leisure time. Increased frequency, respectively excessive time spent playing games can lead pupils to addictive behaviour. For example, this fact has been proved to a small extent by research

(Basler, Mrázek, 2018) in secondary school pupils. In connection with these results and taking into account the specifics of the chosen research sample, the research problem will be determined in the form of a question, which is followed by the formulation of a research assumption.

Research question:

To what extent is the addictive behaviour of playing digital games indicated in pupils of selected lower secondary schools in the Czech Republic?

Research assumption:

RA1: At least 10% of pupils in selected primary schools in the Czech Republic will show addictive behaviour.

4.2 Research

Quantitative methods in the form of a questionnaire were chosen in the analyses. The research was focused on lower secondary school pupils. Lower secondary schools were contacted via email or by telephone, in order for the pupils to participate in the questionnaire survey. Nine lower secondary schools were addressed, three of them denied cooperation, one of the schools wanted to collaborate but the parents were against it. Four of the lower secondary schools denied due to the pandemic (did not have time). One of the lower secondary schools allowed me to collaborate with them.

The undeniable advantage of the questionnaire is its effectiveness. By obtaining a large amount of information from many respondents at once, in a relatively short time, with less effort than with other research methods (Chráska, 2016). The questionnaire had 205 visitors but only **126** pupils completed it completely. The questionnaire was online so by sending the link to the representative, she was able to contact the pupils so that they could fill it out. One of the disadvantages of having a questionnaire as a method of research is the return rate, which was 61,4%. The main reason for this percentage of the responses given back is that the questionnaire was online, pupils filled them at home and there was no control from a teacher. Another disadvantage includes the fact that the questionnaires do not have to find out what the respondents are like in real life, they instead show us how the pupils perceive themselves or want to be perceived by others.

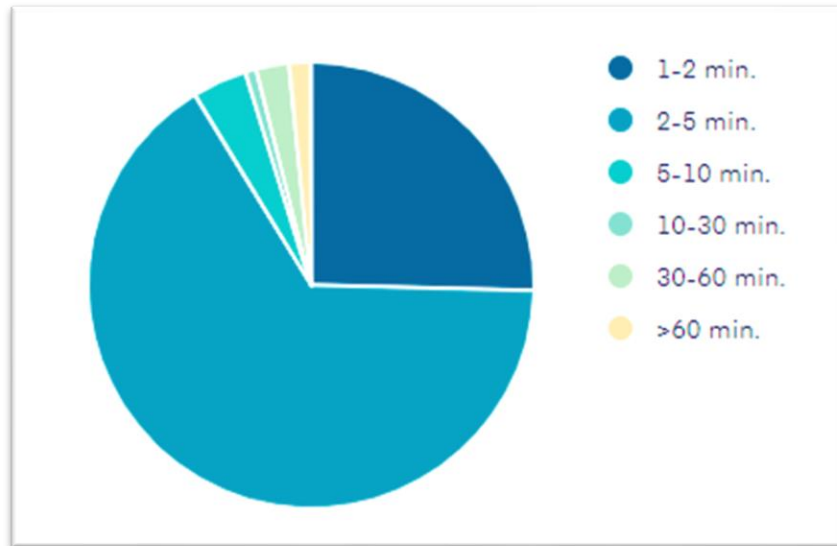


Image 1: Average time spent to fill in the questionnaire

4.3 Questionnaire

Pupils were given a questionnaire to complete anonymously for all the participants. On the first page, the pupils could find the subject of the questionnaire, which was “Addiction to digital games”. There was also an explanation of what digital games are in order for the student to know in case they were uninformed. In an effort to make the definition more familiar to the pupils there were also many examples of devices where pupils can play digital games.

The analysis used to study addition to digital games on lower secondary school pupils is based on a questionnaire, which consists of 11 questions. The questions were partly inspired by the questionnaire of Basler and Mrázek (2018) (Translated by the author). The questions examine individual features of addictive behaviour.

The students were given a scale from 1 to 7, where 1 meant that the statement does not apply to them at all, 4 meant that the statement did and didn’t apply to them (50/50), and 7 meant that the statement did apply to them completely. Based on the responses given by the pupils, a number, of how many pupils have a digital game addiction, was calculated. The maximum score for the digital addiction questionnaire is **77 points**. It was determined that if the respondent obtains a score of 40 and more, he or she shows above-average signs of fixation habits and is therefore addicted to digital games. All obtained data were evaluated using Microsoft Excel and with the help of its implemented functions, I was able to process them.

5. Results and Discussion

5.1 Criteria

The questions chosen for the questionnaire are carefully selected to make a correct hypothesis from the data given by the pupils. In order to create the right questions, I followed a list of criteria, which would make the questions asked accurate for the subject matter. The questions asked are divided into either questions about symptoms (withdrawal symptoms, tolerance, compulsion) or questions about related problems (time management, interpersonal problems). All the queries had one, two or even three criteria hidden within them. The questionnaire had 11 queries, where 4 of them investigate for withdrawal symptoms, 2 investigate for tolerance, another 2 examine for compulsion, 3 of them look into interpersonal problems and 4 examine time management.

Withdrawal symptoms: refers to symptoms that occur when a person is unable to play or tries to avoid playing.

- Digital gaming is relaxing for me, I suddenly forget about problems or stress, I relax, and I feel good. (question 1)
- When I'm not playing, I often think about how the game went, what I can do or how I will proceed when I play again. (question 2)
- When I'm not playing, I'm stressed (nervous, tense). (question 4)
- I feel better and in control when playing digital games. (question 6)

Tolerance: represents an increase in playing time as a result of an increasing desire or need for more exciting games.

- I have a feeling that digital games are becoming more important to me. I have to spend more and more time playing digital games to feel satisfied. (question 7)
- I spend more time playing digital games than I can admit to others. I'm not telling the truth to the others to hide how much time I spent playing digital games. (question 10)

Compulsion: describes failed attempts to regulate or avoid playing, while recognizing a desire to limit playing; this criterion often represents an inclination to relapse.

- I can't imagine life without digital games. (question 5)

- I feel like I can't control the amount of time I spend playing digital games. I tried to reduce the amount of time spent playing, but I failed. (question 8)

Interpersonal problems: relates to continuing to play excessively despite being aware of the problems caused by excessive gaming; Individuals can even hide or outright lie about the amount of time they spend playing. Excessive gaming can put a relationship at risk or cause an opportunity at school to be lost.

- Due to my frequent gaming, I sometimes get into trouble at school or home. (question 9)
- I spend more time playing digital games than I can admit to others. I'm not telling the truth to the others to hide how much time I spent playing digital games. (question 10)
- My parents often forbid me or restrict me from playing digital games. I'm then angry or I play behind their backs. (question 11)

Time management: describes the ability to consciously control the time spend on an activity.

- How often you spend the night playing digital games? (question 3)
- I have a feeling that digital games are becoming more important to me. I have to spend more and more time playing digital games to feel satisfied. (question 7)
- I feel like I can't control the amount of time I spend playing digital games. I tried to reduce the amount of time spent playing, but I failed. (question 8)
- I spend more time playing digital games than I can admit to others. I'm not telling the truth to the others to hide how much time I spent playing digital games. (question 10)

5.2 Results

In this part of the practical part of the thesis, each question used in the questionnaire will be explained. There will be given a percentage of the pupils with a risk of digital gaming addiction. In addition, there will be explained of where the behaviour of the participants can lead to.

Q1. Digital gaming is relaxing for me, I suddenly forget about problems or stress, I relax, and I feel good.		
Scale	Total amount	Percentage
1/7	23	18,3%
2/7	9	7,1%
3/7	3	2,7%
4/7	44	34,9%
5/7	9	7,1%
6/7	15	11,9%
7/7	23	18,3%

Table 3: Question 1 with results

For statement 1 regarding a withdrawal symptom, where 37,3% of the participants are showing an indication of digital game addiction. This percentage is created by the pupils whose answer was 5/7, 6/7 or 7/7. If the statement in question 1 is true for the pupils it can lead to a lack of interest in life's activities other than gaming as well as feeling strongly drawn to gaming is a mark of addiction.

Q2. When I'm not playing, I often think about how the game went, what I can do or how I will proceed when I play again.		
Scale	Total amount	Percentage
1/7	51	40,5%
2/7	17	13,5%
3/7	9	7,1%
4/7	28	22,2%
5/7	2	1,6%
6/7	6	4,8%
7/7	13	10,3%

Table 4: Question 2 with results

Statement 2 also regards a withdrawal symptom, where 16,3% of the pupils are at risk of being addicted to digital games. The statement shows if a pupil has obsessive thoughts about gaming. This kind of behaviour can convert into desperate attempts of justifying his or her return to digital gaming.

Q3. How often you spend the night playing digital games?		
Scale	Total amount	Percentage
1/7	62	49,2%
2/7	12	9,5%
3/7	9	7,1%
4/7	25	19,8%
5/7	8	6,3%
6/7	3	2,4%
7/7	7	5,6%

Table 5: Question 3 with results

For statement 3 concerning a time management problem, 14,3% of the pupils answered with 5/7, 6/7 or 7/7 which indicates that they have poor time management skills. Lacking this set of skills can make the pupils end up not having the ability to prioritize their responsibilities and therefore enhancing their procrastinating skills.

Q4. When I'm not playing, I'm stressed (nervous, tense).		
Scale	Total amount	Percentage
1/7	93	73,8%
2/7	14	11,1%
3/7	3	2,4%
4/7	9	7,1%
5/7	3	2,4%
6/7	2	1,6%
7/7	2	1,6%

Table 6: Question 4 with results

Additionally, question 4 a straightforward statement that addresses withdrawal symptoms shows that only 5,6% of the participants indicate an addiction to digital gaming. The pupils who answered with 5/6, 6/7 or 7/7 express obsessive thoughts about gaming.

Q5. I can't imagine life without digital games.		
Scale	Total amount	Percentage
1/7	43	34,1%
2/7	20	15,9%
3/7	11	8,7%
4/7	34	27%
5/7	6	4,8%
6/7	3	2,4%
7/7	9	7,1%

Table 7: Question 5 with results

Statement number 5 is a statement that shows the compulsion of the participants, 14,3% of them have an excessive compulsion to digital gaming. This statement is a straightforward teller of pupils who show signs of digital game addiction.

Q6. I feel better and in control when I play digital games.		
Scale	Total amount	Percentage
1/7	52	41,3%
2/7	12	9,5%
3/7	14	11,1%
4/7	24	19%
5/7	8	6,3%
6/7	6	4,8%
7/7	10	7,9%

Table 8: Question 6 with results

Statement number 6 is the last question which addresses withdrawal symptoms. Out of all the participants, 19% of them indicate problematic behaviour. Feeling intensely drawn to digital gaming and only in control when playing digital games is a sign of addiction.

Q7. I have a feeling that digital games are becoming more important to me. I have to spend more and more time playing digital games to feel satisfied.		
Scale	Total amount	Percentage
1/7	71	56,3%
2/7	20	15,9%
3/7	13	10,3%
4/7	13	10,3%
5/7	2	1,6%
6/7	2	1,6%
7/7	5	4%

Table 9: Question 7 with results

Statement number 7 addresses both tolerance and time management. 7,2% of the participants are letting digital games become an important part of their lives in order to be satisfied. This can lead pupils to long term ignoring their responsibilities (homework) and making them want to spend more time playing digital games.

Q8. I feel like I can't control the amount of time I spend playing digital games. I tried to reduce the amount of time spent playing, but I failed.		
Scale	Total amount	Percentage
1/7	79	62,7%
2/7	10	7,9%
3/7	7	5,6%
4/7	20	15,9%
5/7	4	3,2%

6/7	3	2,4%
7/7	3	2,4%

Table 10: Question 8 with results

For statement 8 regarding compulsion and time management skills, 8% of the pupils asked are showing signs of addiction. Being unable to reduce the amount of time spent playing or controlling the amount of time spend while playing a strong indicator of compulsion and poor management skills. This kind of behaviour can lead pupils to prolong their time of gaming and losing socializing opportunities.

Q9. Due to my frequent gaming, I sometimes get into trouble at school or home.		
Scale	Total amount	Percentage
1/7	85	67,5%
2/7	14	11,1%
3/7	13	10,3%
4/7	9	7,1%
5/7	0	0%
6/7	2	1,6%
7/7	3	2,4%

Table 11: Question 9 with results

Statement 9 shows which pupils have interpersonal problems which were created thanks to digital gaming. Out of all the participants, 4% answered with 6/7 or 7/7 which shows that digital gaming has interfered with the pupil's life in a negative way by creating problems in their school life and at home.

Q10. I spend more time playing digital games than I can admit to others. I'm not telling the truth to the others to hide how much time I spent playing digital games.

Scale	Total amount	Percentage
1/7	95	75,4%
2/7	13	10,3%
3/7	7	5,6%
4/7	7	5,6%
5/7	1	0,8%
6/7	1	0,8%
7/7	2	1,6%

Table 12: Question 10 with results

For statement 10 regarding tolerance, interpersonal problems, and time management problems, 3,2% of the participants admit lying to others about the amount they spend on playing digital games. In the results of this statement, it can be seen that by using three criteria in one statement the number of participants who admit for it to be true gets drastically smaller.

Q11. My parents often forbid me or restrict me from playing digital games. I'm then angry or I play behind their backs.		
Scale	Total amount	Percentage
1/7	86	68,3%
2/7	12	9,5%
3/7	9	7,1%
4/7	13	10,3%
5/7	1	0,8%
6/7	1	0,8%
7/7	4	3,2%

Table 13: Question 11 with results

For statement number 11 which addresses interpersonal problems. 4,8% of the pupils, who were asked, show a behaviour habit created because of digital gaming addiction. This kind of behaviour

can create problems, in the pupil's life, and worsen family relationships a communication with them.

Addicted		Not addicted		Total	
21	16,6%	105	83,3%	126	100%

Table 14: Results of the questionnaire

As shown from question number 1 and 6, pupils use digital gaming mostly as escapism, as a form of getaway, relaxation, and a place where they are in control. Question number 10 was the only one regarding three criteria at once and therefore it can be seen in the results that it has the least responses where the pupils feel the statement is true to them.

The maximum score in the questionnaire was 77 points if a pupil had 40 and more points he or she was declared as addicted to digital games. Therefore, out of the 126 participants, who answered all the questions in the questionnaire, showing 21 of them to be addicted to digital games.

As a whole, 71 out of 126 participants did not meet any of the criteria, 27 of them met only one and 28 of the respondents fulfil at least two out of five criteria.

Evaluation of research assumption

RA1: At least 10% of pupils in selected primary schools in the Czech Republic will show addictive behaviour.

Based on the result found in tab. 15 we can state that the research assumptions were confirmed. When comparing the results of the research (Basler, Mrázek, 2018), it can be shown that the level of addictive behaviour when playing digital games among pupils has increased. However, it is necessary to take the comparison of results as indicative, because here we compare two different research samples.

6. Conclusion

In my bachelor's thesis, I dealt with the issue of addiction to digital games. As a target group, I chose children in lower secondary school. The work was created due to greater insight into the issues of this topic, which is currently relevant, but awareness among the general public is not very

high. Due to the pandemic, pupils are spending more time at home where they are most likely to pass their time playing digital games.

The theoretical part of this thesis describes digital games and their types more in depth so as to achieve a better understanding of the subject. It unifies available information concerning the usage of digital games in school, which are related to the issue mentioned above. It focuses on addiction to digital games while thoroughly analyzing the risks of it and how to prevent this kind of addiction from happening by learning to recognize addiction symptoms.

One of the main goals of the research was the accurate creation of a questionnaire for this matter of subject. By discussing the criteria which a questionnaire about addiction to digital gaming needs, an understanding about this subject furthers and the capability of creating a comprehensible and correct questionnaire develops. The second main goal of the practical part of my thesis was to find out the percentage of addicted pupils in lower secondary school and therefore determining if its usage at school can be a useful tool while not risking the mental and physical risks of addiction to digital games.

The practical part of my thesis was carried out by questionnaire research, where the respondents were secondary school pupils only from one school owing to the fact that schools are over-occupied with work caused by the ongoing COVID-19 pandemic. Although only one school help with the research 126 pupils took part in it, which is a satisfying number considering the circumstances. It should be stated that a larger scope of analysis of the data was planned, but due to time and the planned scope of work, a more detailed analysis was not performed.

The results of this research show that 16,6% of pupils in lower secondary school are addicted to digital games. Taking into consideration the age of the pupils (12-16 years old), a pandemic in duration and that all of the participants are from the same school 21 pupils out of 126 is not a big number. On that account, teachers should be advised that by being properly informed about prevention and the risks of addiction to digital games they can include digital games into their lessons and use them for educational purposes.

The two main set goals were fulfilled. The questionnaire was successfully created with the aspiration that all the participants answered truthfully. The research which investigated the percentage of the pupils who are addicted was calculated and revealed. With the data collected

from the school, the usage of digital games for educational reasons can be confirmed to not be a risk. My thesis has also confirmed the importance of prevention as well as the significance of being able to recognize the symptoms of addiction to digital games and being able to resolve them. Nevertheless, it should also be mentioned that I am not satisfied with the evaluated results considering the data selected were inadequate. By trying not to make the questionnaire time consuming and keeping it interesting for the pupils, the results ended being partly unequal.

In general, I can say that I am pleased with the outcome of this thesis, I consider it to be beneficial, both in terms of information I have united as well as in terms of experience I have gained in creating it. It also should be stated that there are several areas in which my research could be possibly extended, as I consider my thesis to be a promising foundation for additional work to be built upon it.

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List of images

Image 1: Average time spent to fill in the questionnaire 24

List of tables

Table 1: Model of game genres (freely modified from Rehbein et al., 2016)	11
Table 2: Risk factors named by players and counsellors	20
Table 3: Question 1 with results	27
Table 4: Question 2 with results	27
Table 5: Question 3 with results	28
Table 6: Question 4 with results	28
Table 7: Question 5 with results	29
Table 8: Question 6 with results	29
Table 9: Question 7 with results	30
Table 10: Question 8 with results	31
Table 11: Question 9 with results	31
Table 12: Question 10 with results	32
Table 13: Question 11 with results	32
Table 14: Results of the questionnaire.....	33

