Under the Spell of Video Games - Minecraft is an Opportunity for Game-based Learning

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Abstract: Within the context of three Minecraft children's university camps, this study systematically examined the positive motivational impacts and adverse consequences associated with video game engagement. The Minecraft game served as an interactive tool for educational purposes and the cultivation of students' attitudes. Two camps focused on the theme of renewable energy sources, while one centered on the realm of security technology. Using questionnaire research during the camps, we sought to investigate students' motivations for gameplay and identify potential areas of problematic usage. The research findings shed light on the gaming habits of the participants, providing valuable insights for the planning of future Minecraft camp learning and teaching processes. Notably, the Minecraft video game played a significant role in fostering students' environmental and safety awareness, enhancing their interest in technology, and cultivating skills such as problem-solving, algorithmic thinking, creativity, cooperation, and effective communication. These outcomes underscore the potential of Minecraft as an educational tool and contribute to the broader understanding of its impact on children's development in various domains.

Keywords: video game; game-based learning; Minecraft

1 Introduction

In recent decades, video gaming, encompassing computer games and online games, has witnessed a widespread global prevalence and is acknowledged as a predominant leisure activity, particularly among the youth. While the detrimental effects, problematic gaming behaviors, and video game addiction are extensively recognized and officially classified as a mental disorder by the World Health Organization (WHO), this article deviates from the conventional discourse by focusing on the examination of how the intrinsic motivational power and developmental opportunities inherent in video games can be harnessed positively with educational goals.

This study introduces a distinctive initiative that effectively leverages the advantages of video games in the learning-teaching process. During the summer of 2023, three children's university camps were conducted at different locations, catering to students aged 9-17. Centered around two themes, these camps employed the interactive use of the Minecraft game for learning purposes and the cultivation of attitudes among participants. Two camps were themed around the development of environmentally conscious and sustainable cities, while one addressed complex asset protection and military technology. Participants confronted genuine challenges in the virtual world of Minecraft, using their creativity and problem-solving skills. The Minecraft video game played a pivotal role in fostering students' environmental and safety awareness, concurrently increasing their interest in technology. This innovative learning approach not only augmented participants' knowledge but also introduced them to university life and career-oriented topics related to renewable energy sources, green alternatives, and safety technology, including military applications. Game-based learning with Minecraft contributed significantly to the development of problem-solving skills, algorithmic thinking, and creativity, while the project-based methodology employed in the camp provided a platform for cooperation and effective communication among students.

2 Features of Video Games

Several definitions of the concept of video games can be found in the literature. According to the definition of Frasca [1], this includes all text or image-based computer software that runs on an electronic platform (e.g. desktop or console) involving one or more players. Costikyan [2] also points out that in video games, players fight for some goal. Tavinor [3] perceives video games as a digital medium that is a means of entertainment and recreation. The entertainment function of video games is based on interactivity and rules, which together help to engage in the gaming activity. However, the term computer game includes only

those games that can be played on a computer, console or mobile device based games are not included. McGonigal [4] summarized the common features of video games as follows: (1) In video games, there is a goal, a determining factor that the player wants to achieve. (2) Rules determine how the player achieves the goal of the game. (3) All video games have feedback systems that show where the player is on the way to the goal. (4) Voluntary participation is a characteristic of all video games.

Video games can be grouped according to several aspects. According to the platform on which they are used, we distinguish games based on computers, consoles and handheld devices (mobile phones, tablets). Categorized by game mode, there is the single-player mode, in which the player can only interact with the characters created by the developers present in the virtual space, and the multiplayer mode, in which the player "meets" other players, so they can solve the game's tasks cooperatively, challenges [5].

According to another division, we distinguish between online and offline games. Offline games are played by the player alone to achieve goals that can be achieved alone. These games have a starting point and an endpoint. On the other hand, in the online version, the player can interact with other players over the Internet; they can communicate, cooperate or compete with each other. For them, the tasks do not end, as the game is constantly updated with new objectives, as well as objectives that can only be achieved together with others. In other words, online games are primarily distinguished from offline games by their social nature [6].

Video games are becoming more and more common in the world. Based on 2023 data from the Entertainment Software Association (ESA), 212.6 million people in the US play video games for at least one hour per week (that's 65% of the US population). 62% of adults and 76% of children under 18 play video games. According to the survey, gamers play because video games bring them pleasure (86% of respondents stated this), games can provide mental stimulation (84%), relieve stress (83%), help develop cognitive skills (81 %) and provide a sense of community (according to 71%). 80% of gamers play together with others [7].

One of the benefits of video games is that they can improve players' cognitive skills. For example, action games develop reflexes; logical games develop logical thinking and memory. Multiplayer games can have a positive effect on social skills: on the one hand, they develop certain personality traits such as tolerance, patience, and acceptance, and on the other hand, social skills like cooperation, communication, and foreign language skills. The integration of virtual reality (VR) in gaming further enhances the immersive experience, providing players with an unprecedented level of engagement and sensory stimulation. [8; 9] This not only contributes to the development of digital competencies, problem-solving skills, and logical thinking but also fosters non-cognitive abilities. In addition, gamification and game-based learning have been shown to motivate and activate students [10], leading to a comprehensive enhancement of their cognitive and non-cognitive abilities [11-17].

At the same time, many researchers [18-24] drew attention to the problematic use of online video games. It is a problem if the player starts to feel more and more important about his virtual performance compared to reality [25]. Since he spends a lot of time playing, he neglects his everyday activities and social relationships, which can lead to social isolation. Violent games can increase player aggression. Many people immerse themselves in the virtual world of the game, thus trying to escape from their real problems. Excessive video game use can lead to addiction (e.g. compulsiveness, depression, aggressiveness, low self-esteem) [6, 26, 27] and also causes the deterioration of real interpersonal relationships, the neglect of obligations, the deterioration of health and state of mind [28, 29].

3 An Option for Game-based Learning: Using Minecraft in Education

In the summer of 2023, we conducted three summer university camps for children, using the game Minecraft for educational purposes. Minecraft is a so-called sandbox video game where there are no mandatory paths to follow, and the objective is not to win but to experience the joy of creation. Similar to real-world playground sandboxes, it allows building anywhere according to the player's ideas and imaginations. In Minecraft, players can create new worlds using 3D elements, cubes, known as blocks. They can construct various buildings and populate our virtual world with animals and plants.

Minecraft's three game modes provide learning opportunities and real-life parallels. Creative mode is like an open canvas that reflects a limitless learning environment, with almost all resources and tools at our disposal, encouraging imagination and innovative thinking. Survival mode is similar to real-world problem solving, requiring players to strategically gather resources and build shelter while dealing with threats, similar to overcoming life's challenges. Hardcore mode reinforces the principles of Survival Mode, reflecting real-life risk situations where decisions matter and the consequences of failure are even more severe, emphasizing the importance of resilience and careful planning.

Minecraft Education Edition is specifically designed for educational purposes. The game's virtual world facilitates learning, offering students an attractive opportunity to model various phenomena in a simulation environment. [27; 28]. The application of Minecraft contributes to the development of numerous competencies, such as communication, collaboration, logical thinking, algorithmic thinking [29], problem-solving, creativity, design thinking, openness, spatial vision, and spatial orientation [30-32]. A 2017 study [33] highlighted Minecraft's skill development possibilities, with 90% of teachers who used Minecraft in the classroom stating that the game develops students' problem-solving abilities, creativity, critical thinking and collaboration skills.

In our three university camps for children, we applied the game Minecraft to develop students' safety and environmental awareness. The "Smart and Safe Buildings Development in the Minecraft World" camp introduced students to building automation, building supervision, industrial control systems, and their security technology and information protection backgrounds and tools. Our programmers modified and enhanced the base application, giving students a realistic view of smart technologies and information protection and security devices. In the virtual space of Minecraft, students created the civil and security protection conditions of an industrial park located on an island, modeled and examined objects, and designed and implemented automation and security technology plans, taking into account cybersecurity aspects as well.

Two camps dealt with the theme "Island City Development with Green Energy in the Minecraft World." With the help of the Minecraft world, students became familiar with the system-level operation of renewable energy sources and green alternatives, as well as the methodology and tools of smart city development. Here again, our programmers modified the base application, which helped participants get a realistic picture of the technologies and energy devices. The players' goal was to revitalize the economy of the abandoned island city, harmonize the infrastructure and housing situation, and design, prepare, and implement a green island city model in the virtual space, considering climate protection aspects.

The use of the Minecraft game for learning and teaching leveraged the positive effects of video games. As an option for game-based learning, Minecraft motivated students to learn, captured their attention and interest, engaged with school subjects in a playful manner, and addressed questions contributing to the development of their scientific thinking and expanding their interest in engineering and technology.

4 Questionnaire Research on Online Games

To enhance our understanding of the gaming habits, needs, and motivations of the campers and to integrate this information into the planning of the camps, thereby optimizing the efficiency of the Minecraft camp, a survey was conducted. These questionnaires were carried out during the days of the camp, seamlessly integrated into the thematic activities. This approach facilitated dynamic data collection, tailored to the context of the camp and the interests of the participants. The feedback and observations gathered are crucial for the ongoing development and refinement of future camps, ensuring they align more closely with the evolving preferences and learning styles of the campers.

4.1 Purpose and Hypothesis of the Research

The primary objective of our questionnaire-based research was to investigate the motivations behind students' engagement in gaming and to discern the dimensions and extent of problematic gaming behavior. This endeavor aimed to provide insights into the gaming habits of the students, subsequently informing the optimization of the teaching-learning processes within the Minecraft camps.

Building upon previous research findings and drawing from our educational experiences, we formulated the following hypotheses:

1) We posited that participants in the camp primarily engage in gaming for recreational purposes, seeking enjoyment and amusement.
2) Intrinsic motivation was anticipated to be the predominant factor among the examined players, suggesting that they derive motivation from the inherent enjoyment of the gaming activity itself.
3) We hypothesized that a significant concern for the participants lies in the potential consequence of becoming engrossed in the game, leading to the neglect of responsibilities and interpersonal relationships.

4.2 Measuring Tools of the Research

In the course of our research, we employed five distinct questionnaires to comprehensively assess various facets related to video game usage:

1) Motives for Online Gaming Questionnaire (MOGQ) [34]: The MOGQ captures prevalent characteristics of online video game genres and serves as a valuable tool for measuring gaming motivations. The questionnaire's motivational structure is categorized into seven major groups: escape, coping, fantasy, skill development, recreation, competition, and social.
2) Self-developed Questionnaire [35]: Specifically tailored for the exploration and evaluation of motivations within the context of the Minecraft game, this questionnaire is designed to elicit insights into the unique aspects of Minecraft gameplay motivations.
3) Gaming Motivation Scale (GAMS) [36]: The GAMS is employed to identify the underlying motivations driving video game usage. It differentiates between intrinsic and extrinsic motivation, encompassing four levels: integrated regulation, identified regulation, introjected regulation, and external regulation and motivation.
4) Player Experience of Need Satisfaction (PENS) [37]: The PENS questionnaire delves into an individual's motivations for game usage, focusing on three primary components: autonomy, competence, and relatedness. It aims to uncover the fundamental factors influencing an individual's preferences and considerations regarding game use.

5) Problematic Online Gaming Questionnaire (POGQ) [38]: The POGQ is specifically designed to unveil the components associated with problematic online game use and to delineate measurable dimensions thereof. The model discerns six factors related to problematic online game use: preoccupation, overuse, immersion, social isolation, interpersonal conflicts, and withdrawal.

4.3 The Research Sample

In the forthcoming summer of 2023, our questionnaire research will be conducted within three Minecraft camps, involving a total of 45 participants. Among the participants, 31.1% are female, 68.9% are male, and the average age is 12.36 years. The age range spans from nine to 17 years, with the youngest participant being nine years old and the eldest being 17.

A notable proportion of the study participants allocate several hours per day to engaging in computer games. Specifically, 32% of participants dedicate 1-2 hours, 25% allocate 2-3 hours, 11% invest 3-4 hours, and 25% expend more than 4 hours daily on computer-related activities, including computers, video games, and online games. This usage pattern is notably high. One of the primary objectives of our Minecraft camps is to channel the students' gaming time into meaningful learning experiences, integrating tasks that necessitate computer use along with activities promoting self-awareness, interpersonal relationships, and extrication from the virtual space.

4.4 Results of the Research

4.4.1 Results of the Motivation to Play Online Questionnaire (MOGQ) and the self-developed Minecraft motivation questionnaire

The Online Gaming Motivation Questionnaire (MOGQ) [34] was used to examine diverse gaming motivations, with respondents rating 27 statements on a 5-point Likert scale. Higher scores on the scale denote a more frequent occurrence of the respective motivational dimension. The questionnaire's motivational framework comprises seven major groups:

- Escape/Escapism: Involves seeking refuge from the real world and its problems.
- Coping: Encompasses using game activity to manage stress and aggression, fostering a positive mood.
- Fantasy: Provides players the opportunity to adopt new roles and identities beyond their own, exploring possibilities not feasible in reality within the confines of a fantasy world.

- Skill Development: Focuses on the enhancement of the player's coordination, concentration, and other cognitive skills.
- Recreation: Aims to relax and offer recreation to the player.
- Competition: Encourages competitive engagement, motivating players to surpass others.
- Social: Facilitates interaction with others, fostering the joy of communal play and camaraderie.

The questionnaire demonstrated satisfactory reliability (Cronbach's alpha: 0.901). Upon analyzing the results, it became evident that recreation emerged as the primary motivation for students participating in Minecraft camps. Specifically, students engage in gameplay for relaxation and entertainment, reflected in the highest average score of 4.33 (standard deviation: 0.85) on the 5-point scale (Figure 1). Additionally, for the majority of students (48%), recreation can be considered the predominant motivational dimension (Figure 2). This outcome substantiates our first hypothesis, affirming that recreation is the dominant motivation among participants in Minecraft camps.

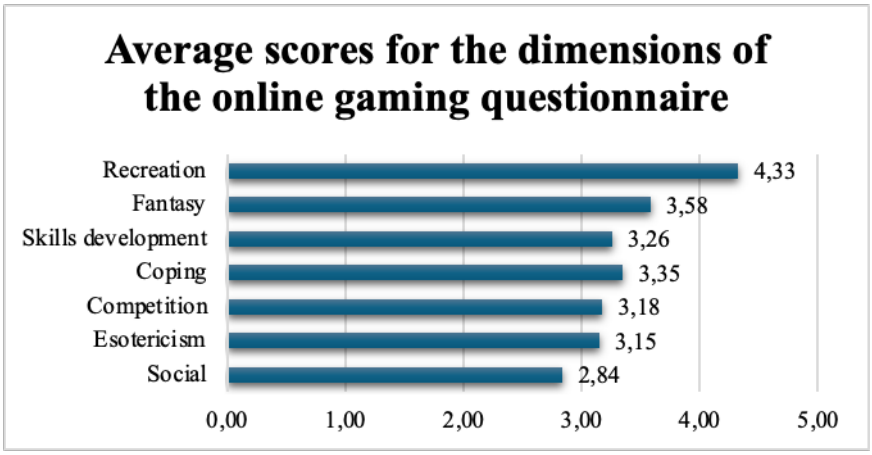

Figure 1

Based on the mean scores of the dimensions of the online gaming questionnaire (evaluation on a 5-point scale, N=44)

The remaining motivational dimensions manifest in notably smaller proportions. Competition emerges as the dominant motivational factor for 14% of respondents, indicating a proclivity for competitive engagement and deriving pleasure from outperforming others. Fantasy holds prominence as the primary motivational factor for 11% of respondents, underscoring their appreciation for the game's capacity to facilitate the exploration of new roles within a fantasy world, exemplified by their endeavors in constructing fantasy realms during Minecraft sessions in the evening.

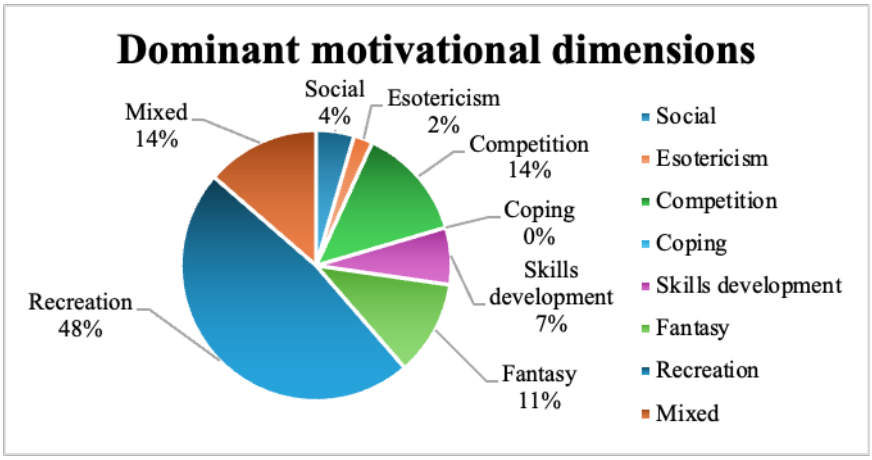

Figure 2
Distribution of the motivational dimensions of the online gaming questionnaire (N=44)

Numerous studies [37-40] have highlighted the robust correlation between the dimensions of escape and avoidant coping. While escape, or escapism, underscores disengagement from reality, avoidant coping strategies assist in dealing with genuine issues (stress, aggression, anxiety) by addressing unpleasant moods and unwelcome impulses [26]. Our research corroborates a significant correlation between escapism and coping (Spearman correlation, r=0.373, p=0.013). However, the most robust and significant correlation is observed between escapism and fantasy (r=0.606, p=0.000), indicating that students endeavor to escape real-world problems through engagement with a fantasy realm.

The outcomes pertaining to the motivational dimensions of online play are further substantiated by our self-developed questionnaire, specifically tailored for the examination of motivations within the context of the Minecraft game. Consistently, the primary motivations identified are fantasy and recreation. Respondents express a strong affinity for Minecraft due to its capacity to actualize their creative ideas, enabling the construction of a personalized world, and its efficacy in providing relaxation. These aspects garnered emphasis both at the commencement and the conclusion of the camp (Table 1).

Table 1
Evaluation of the Minecraft game on the first (N=44) and last (N=41) days of the camp

	What I love about Minecraft is that…		**What I liked about Minecraft during the camp was that**		**The difference between the average age**
	age	**SD**	**age**	**SD**	
You can play together with others.	3.34	0.834	3.41	0.805	0.07

You can build a new world of your own.	3.55	0.730	3.37	0.968	-0.18
I can realize my ideas in it.	3.59	0.844	3.27	0.949	-0.32
The graphics are good.	2.77	0.937	2.93	1,034	0.16
You can learn a lot from it.	2.80	1.025	3.27	0.742	0.47
I can solve tasks.	2.77	0.961	3.49	0.597	0.72
Provides good relaxation.	3.52	0.628	3.39	0.586	-0.13
It models the real world.	2.41	1,019	2.78	1,061	0.37

We employed Spearman's correlation analysis to explore the relationships between individual motivational factors. On the first day of the camp, a notable and statistically significant correlation was observed between the realization of ideas and the construction of a new world ($r=0.587$, $p=0.000$), underscoring a robust motivational inclination towards the fantasy dimension. However, on the concluding day of the camp, in addition to fantasy, the motivational influence of social relationships became evident. The closest significant correlation was identified between the realization of ideas and engaging in collaborative play with others ($r=0.561$, $p=0.000$).

While, on the first day, the pleasure derived from modeling is most strongly associated with recreation and relaxation ($r=0.371$, $p=0.013$), by the last day of the camp, it is notably linked with playing alongside others ($r=0.391$, $p=0.011$). This shift suggests that the Minecraft camp facilitated the cultivation and fortification of social bonds through communal play, emerging as an enjoyable collective activity.

4.4.2 Results of the GAMS (Gaming Motivation Scale) Questionnaire

Lafrenière, Verner-Filion, and Vallerand [35] delineated six motivations underpinning the utilization of video games, categorized as either external (extrinsic) or internal (intrinsic) motivations:

1) **Intrinsic Motivation:** Rooted in the inherent enjoyment of the gaming activity, intrinsic motivation is inherently rewarding, motivating, satisfying, and enjoyable in itself.
2) **Extrinsic Motivations (Four Levels):** a. **Integrated Regulation:** The gaming activity becomes an integral part of the player's life and identity. b. **Identification (Identified Regulation):** The player immerses themselves in video game use due to its connection to real-life goals. c. **Introjected Regulation:** The player persists in gaming activity to

mitigate negative emotions or effects. d. **External Regulation:** The player engages in gaming for external rewards.

3) **Amotivation:** Characterized by the absence of intrinsic motivation, the individual lacks personal motivation for game engagement, and the reasons for continuation are unclear.

The reliability of the questionnaire was established (Cronbach's alpha: 0.897). Results indicated that camp participants are primarily driven by intrinsic, internal motivation in gaming (average: 5.06, standard deviation: 1.31, assessed on a 7-point scale).

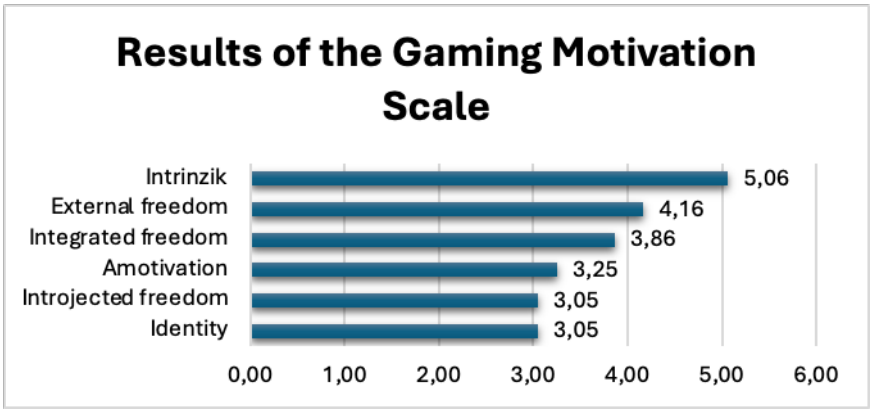

Figure 3
Results of the Gaming Motivation Scale (average, N=43)

Their engagement is fueled by the enjoyment derived from the game itself. External regulation garnered a slightly lower average score (mean: 4.16, standard deviation: 1.65), signifying that in-game rewards also exert a significant motivating influence. Integrated regulation, indicating that the game has become an integral part of students' lives, emerged as the third-highest motivational factor, with an average score of 3.86 and a standard deviation of 1.49 (Figure 3). A correlation analysis between individual motivations revealed the most robust and significant correlation between integrated and external regulation ($r=0.750$, $p=0.000$, Spearman correlation). This implies that rewards contribute significantly to the game becoming an inherent aspect of the player's life.

We examined each player in which area they achieved the highest average score, and based on this, we determined their dominant motivation. Intrinsic, internal motivation is dominant for the largest part of the examined players, 56% (Figure 4). This result confirmed our 2nd hypothesis.

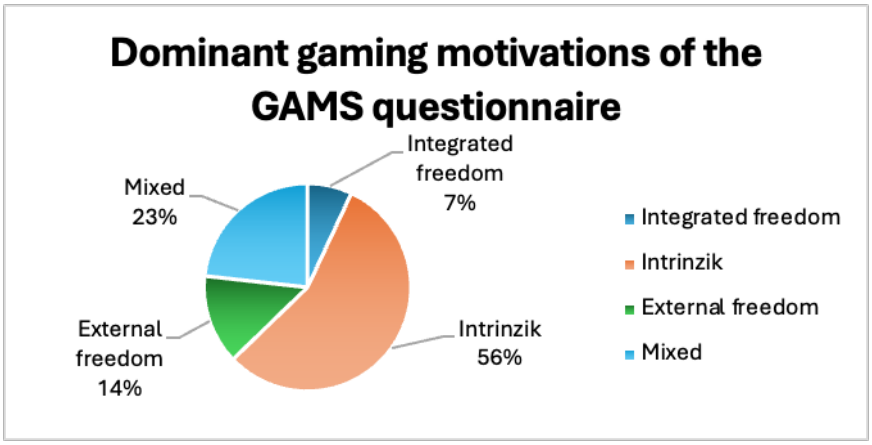

Figure 4
Dominant gaming motivations of the GAMS questionnaire (%, N=43)

4.4.3 Results of the PENS (Player Experience of Need Satisfaction) questionnaire

The Player Experience of Need Satisfaction (PENS) model, rooted in self-determination theory [33], delineates how players can fulfill their fundamental real-life needs—autonomy, competence, and relatedness—through the utilization of video games, owing to the rewarding and intuitive nature of gaming. Autonomy involves the individual's ability to make independent decisions motivated by internal factors. The need for relatedness pertains to the requirement for social connection and affection. Competence reflects the desire for effectiveness and significance. The reliability of the questionnaire was affirmed (Cronbach's alpha: 0.784). Results indicate that participants in the camp exhibit the most pronounced need for autonomy (average: 5.76, standard deviation: 1.09, assessed on a 7-point scale), emphasizing their desire to make independent decisions and pursue personal goals. The need for competence and relatedness garnered lower mean scores (competence - mean: 5.15, standard deviation: 1.046; relatedness - mean: 4.83, standard deviation: 1.10). (Figure 5)

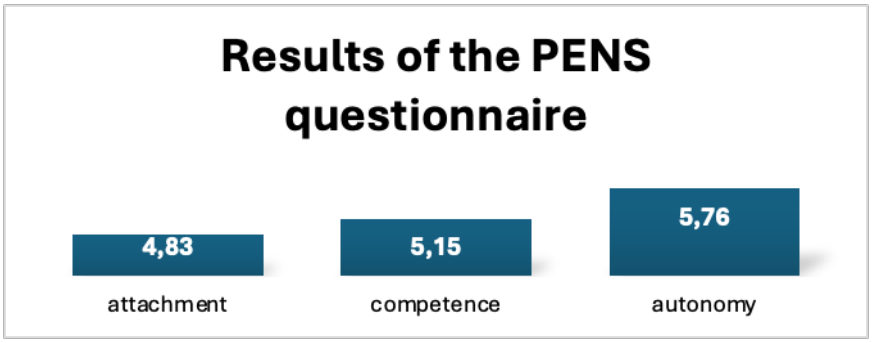

Figure 5
Results of the PENS questionnaire (average, N=41)

4.4.4 Results of the Problematic Online Game Questionnaire (POGQ).

The Problematic Online Gaming Questionnaire (POGQ) [37] serves to delineate the components of online problematic game use and the identifiable dimensions along which it can be measured. This 18-item questionnaire gauges the extent of problematic engagement with online video games on a five-point Likert scale.

The questionnaire discerns six factors contributing to problematic online game use:

- Obsession (Preoccupation): Involves persistent thoughts about using online games and dreaming about the game.
- Overuse: Encompasses excessive engagement with online gaming, increased playing time, and a loss of control.
- Immersion: Relates to an intense preoccupation that leads to forgetfulness about time constraints.
- Social Isolation: Indicates a preference for gameplay over personal and social interactions.
- Interpersonal Conflicts: Involves signals from the social environment concerning excessive game use, leading to interpersonal tension.
- Withdrawal: Encompasses symptoms experienced when unable to play or play as much as desired, such as tension, restlessness, and irritability.

The reliability of the questionnaire was validated (Cronbach's alpha: 0.902).

In our research, the predominant issue identified among surveyed campers is forgetfulness (average: 3.46, standard deviation: 0.82, rated on a 5-point scale), signifying an excessive immersion in the game. This result corroborates our third hypothesis. Additionally, obsession emerges as a significant problem, indicating

that students frequently dream and think about the game (average: 3.13, standard deviation: 0.89), along with overuse, highlighting excessive time spent playing the game (average: 2.78, standard deviation: 0.97) (Figure 6).

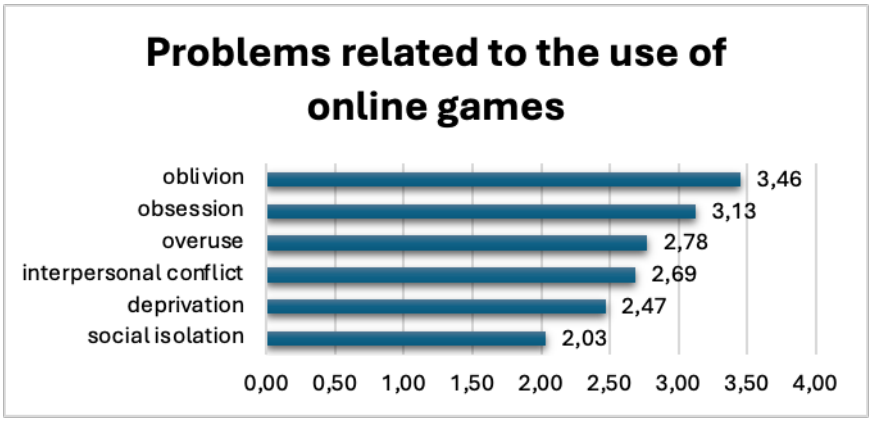

Figure 6

Problem areas of using online games (average rating on a 5-point scale, N=40)

Upon evaluating the dominant issue among surveyed students, determined by the highest average score within the six problem areas, it is observed that the most prevalent problem for a substantial portion of players, constituting 30%, is forgetfulness. Additionally, 25% identify obsession, characterized by persistent thoughts and dreams about the game, as their primary concern. For 20% of the respondents, multiple problem areas received equally high scores, making it challenging to definitively identify the dominant problem (Figure 7).

The closest significant correlation is observed between withdrawal and obsession, indicating that when students are unable to play, they experience withdrawal symptoms (tension, restlessness, irritability) and concurrently engage in frequent dreaming and thoughts about online games (Spearman correlation, r=0.622, p=0.000).

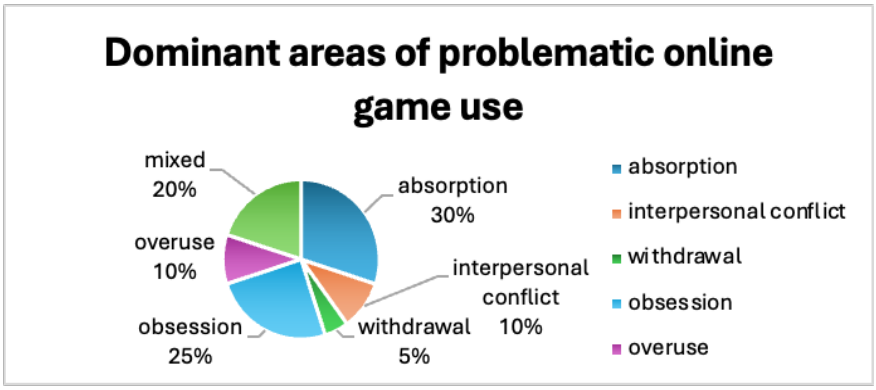

Figure 7
Dominant problem areas of using online games (%, N=40)

Previous research [41, 5] has demonstrated a notable positive correlation between problematic game use and escapism as a motivation, implying that difficulties in coping with negative emotions and the desire to escape reality contribute to problematic gaming.

Wan and Chiou's study [42] identified that individuals classified as video game addicts are primarily motivated to play the game as a means to alleviate and avoid negative emotions arising from the dissatisfaction of unmet needs (e.g., a sense of belonging). Demetrovics et al. [37] designate players exceeding a score of 65 points as problematic gamers (the maximum score attainable on the questionnaire is 90). In our research, 9.76% of surveyed students surpassed this threshold. This rate markedly exceeds the prevalence observed in prior research among adolescents: 1.2% in Germany [43], 4.2% in Norway [44], 4.6% in Hungary [45], and 8.5% in the United States [23].

In response to the identified issues related to video game use, our approach in designing Minecraft camps involves the establishment of a structured framework for playing time, directing it exclusively towards learning, cognitive activities, and skill development. Concurrently, we integrate sessions on self-knowledge and personality development into the camp agenda. These sessions are facilitated by a dedicated individual available to students throughout the camp's duration, providing support through face-to-face conversations when needed.

Conclusions

The research introduces a distinctive initiative that effectively underscores the advantages and motivating impact of video games [46] in the educational process. During the summer of 2023, children's university camps were conducted at three different locations, focusing on two themes for students aged 9-17. The camps used the Minecraft game to acquaint participants with the development of environmentally conscious and sustainable cities, while one addressed complex

asset protection and military technology. Within the Minecraft game environment, students encountered authentic challenges, navigating them with the application of creativity, logical thinking, and problem-solving skills. In addition to the development of these skills, participants also gained firsthand experience of the university environment, including lecture halls, laboratories, and the educational platform system (Moodle), enriching their understanding of academic life and learning processes.

A crucial aspect of the study involved conducting questionnaire research to delineate the gaming habits, motivations, and potential issues among participating students. The findings revealed that recreation and enjoyment stand out as the primary motivations for gaming. Fantasy holds significant importance in the context of Minecraft gameplay, providing a platform for young individuals to materialize their ideas in a fantasy world, often serving as an escape from real-world challenges. Furthermore, Minecraft contributes to the formation and enhancement of social relationships by facilitating cooperation among players. In addition to intrinsic motivation, autonomy and the capacity for independent decision making emerged as dominant factors among the interviewed players.

However, the research also highlighted problematic aspects. A substantial proportion of surveyed players dedicate an excessive amount of time to gaming, with 25% playing more than 4 hours daily, and 9.76% falling into the category of problematic gamers. Consequently, in the planning of Minecraft camps, including the agenda and task design, efforts are directed towards managing gaming time within a suitable framework. The goal is to channel this time exclusively towards learning, fostering interpersonal connections, and developing students' skills, abilities, and attitudes. Depending on this, we will provide enough breaks to spend time in nature, plan educational excursions and take the campers to energy and safety labs.

The limitations of the study are the following. Altogether 45 students filled out our questionnaires; therefore, the small size of this research sample did not allow for deeper statistical investigations. However, we plan to expand our camps in the future by covering new fields of science and targeting students, teachers and trainee teachers in higher education. This will enable us to carry out a larger and more significant analysis.

Acknowledgement

Many enthusiastic, proactive, and sustainability-interested upper primary school students supported this work. Their active participation strengthened our commitment to the vision we have developed. We must thank them so much because of them the future will be different, and we will improve our camps.

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