ESports for the gifted and talented: a case study of a high-performance university programme

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Abstract. ESports are emerging as relevant cultural and economic phenomena, especially among young audiences. This trend is associated with the promotion of several skills among players, including teamwork, strategic thinking, and problem-solving. However, the potential of eSports as a means to identify and develop gifted and talented students remains relatively unexplored. To this end, this study examines the relationship between eSports and the identification and development of gifted and talented students in a specific higher education context. Following a case study methodology, the activities, performance metrics and selection criteria of an eSports programme on a university campus in Mexico were analysed. Initial results suggest that eSports not only enhance cognitive skills and social interactions, but also provide a supportive environment conducive to the development of gifted learners. Yet, there are opportunities in the process of recruiting potential gifted and talented students. The ideas presented in this paper aim to provide educators and policy makers with innovative approaches on talent development, and serve as a fundamental step towards integrating eSports into educational strategies to identify and support gifted and talented students in higher education.

Keywords: Gifted and Talented, eSports, Video Games, Higher Education, Educational Innovation.

1 Introduction

Giftedness and Talent (GT) have traditionally been associated with outstanding performance in academic and creative areas, ranging from exceptional cognitive abilities to specific talents in music, art, and sports [1]. Nevertheless, identifying and nurturing GT individuals in the current context calls for the consideration of emerging activities and settings that extend beyond traditional approaches, such as interactive digital environments. Video games, and especially those structured around competitive multiplayer configurations, such as eSports, are being acknowledged as an arena where players can build critical competencies including complex problem-solving, effective teamwork,

and strategic thinking [2]. These skills can be transferred to the work context, greatly impacting the personal and professional growth of the players [3]. The growing popularity of eSports among young audiences is a cultural and economic phenomenon recognized to promote cognitive skills, social interactions, and leadership attributes necessary for personal and professional fulfilment. Notwithstanding these perceived benefits, the untapped potential of eSports to help identify and develop gifted and talented individuals is still underexplored, representing a worthy opportunity for educational innovation and research.

This paper aimed to explore the relationship between eSports and GT in a representative university team from Tecnologico de Monterrey, Mexico, following the case study methodology. Specifically, the research sought to answer the following questions What skills does the eSports programme develop that are consistent with the GT framework? What are the limitations of the eSports programme in identifying and developing the potential of GT students? The research process focused on an in-depth interview with the representative team coach, co-author of this paper. The theoretical framework, the case study of the representative team, a selection of GT criteria, and an analysis of the relationship between the two fields are presented. The study highlights the potential of integrating eSports into educational contexts to help identify and develop GT students, and provides innovative strategies for educators and policy makers.

2 Theoretical Framework

2.1 Developing GT skills in digital environments

Digital environments have become an increasingly integral part of education, offering unique opportunities to enhance the learning experience. This is particularly relevant in the context of GT education, where the unique needs of GT students can be met through tailored digital tools and environments. Digital differentiation enables the creation of personalised educational experiences for GT students, using digital tools to design individualised learning pathways that support creative GT through project-based activities and network interactions, applicable in both traditional classrooms and online environments [4,5]. They also promote collaboration, learning motivation, autonomy, critical thinking, and communication, enabling teamwork and idea sharing through collaborative tools [6,7]. Thus, the integration of digital environments in GT education addresses individual learning needs and promotes a holistic educational experience that prepares students for future challenges in a technology-driven world.

Digital games-based learning (DGBL) provides an interactive and experiential learning experience, where students can learn in a hands-on and participatory way. DGBL enhances critical thinking and problem-solving skills and promotes engagement, team building, and innovation behaviours in college students [2,8]. The personalisation of learning makes it possible to adapt educational challenges to the ability level of each GT student, while cognitive stimulation through interactive activities and multimedia resources promotes creativity and critical thinking. However, there are challenges such as the need for supervision and guidance for the effective and safe use of technology

[9], the risk of technology dependency that could affect social skills [10], and the digital divide that can lead to inequalities in access to educational resources [11]. Addressing these challenges is important to ensure that the integration of technology in the education of GT students is beneficial and equitable.

2.2 High-performance competitive video games

Before the boom in eSports, team-based gaming in video games revolved primarily around traditional multiplayer mode games. This type of videogame has long been seen as having the potential to develop teamwork, strategic thinking, and problem-solving skills among players [12]. In addition, the collaborative nature of team-based video games allows players to cultivate core communication skills and a strong sense of community [13]. According to Yu & Cardoso-Leite [14], video games could potentially be used to enhance social interaction and collaboration, both critical components of successful team dynamics. Coordination, planning, and mutual monitoring skills can be fostered through team play, as video games provide a unique environment in which participants can learn to coordinate actions and work towards a common goal [15]. Indeed, given the rapidly evolving nature of the gaming industry, the potential of video games to enhance team-oriented skills remains of great interest in both educational and professional settings.

ESports, or competitive video gaming, has rapidly grown in popularity and importance, influencing various sectors including higher education. Universities and colleges are increasingly integrating eSports into their curricula and campus activities, recognising its potential to enhance student engagement, career readiness, and interdisciplinary learning. A framework for eSports curricula in higher education can be developed by focusing on career prospects, interdisciplinary complexity, and addressing the needs of innovators in the field [16]. It can also be developed by identifying key learning outcomes and aligning them with industry needs [16]. By incorporating a wide range of disciplines and focusing on practical, career-relevant skills, higher education institutions can prepare students for success in the rapidly growing eSports industry.

3 Methodology

This study followed the case study methodology to investigate the potential of eSports in the identification and development of gifted and talented (GT) students in a higher education context. The case study method refers to an in-depth investigation of a specific individual, group, event or situation. It involves the collection and analysis of detailed and contextualised information in order to gain insight into the object of study and to draw meaningful conclusions [17]. In this instance, the focus was on the representative varsity team of the eSports programme of the Tecnologico de Monterrey, Guadalajara campus, in Mexico. Primary information was obtained through a semi-structured interview with the coach of the eSports team, co-author of this article. The research process involved obtaining detailed information about the team's activities, performance metrics and evaluation tools for analysis by the authors.

To conduct the interview, we created a WhatsApp group between the co-authors, using English as a neutral language, as we are in different cities in Mexico and France. Given the different time zones, we decided to ask the coach a series of questions and encourage him to reply as soon as possible, sometimes immediately and sometimes later. This facilitated a collaborative approach that allowed for flexibility, clarification of objectives, exploration of issues and progressive discussion towards achieving the objectives.

Developing a Rubric for Assessing eSports in GT Education

The development of the rubric for evaluating eSports in GT education began with a comprehensive analysis of the specific needs and capabilities of GT students in the context of improving digital literacy and cognitive skills, and explored the specific framework of the Tecnologico de Monterrey eSports programme (see Figure 1). The criteria were carefully selected to align with the programme's emphasis on high performance training and competitive participation in gaming, ensuring relevance to both educational and skill development goals. Recognising that gifted students often require intellectually stimulating environments [18], the rubric emphasised criteria such as 'improving cognitive skills' and 'developing digital literacy'. These criteria were chosen to promote critical thinking, strategic decision-making and advanced problem-solving skills [2], all of which are essential for developing the potential of gifted individuals in a competitive environment.

“Engagement and motivation” were identified as important factors in sustaining the interest and participation of gifted students. Therefore, these aspects have been included in the rubric to assess how effectively the eSports programme encourages continued learning and growth beyond the traditional academic setting. This criterion not only promotes continued engagement, but also encourages gifted learners to take charge of their own learning and strive for continuous improvement, which meets their ever-evolving educational needs [2, 19].

The criteria included in the rubric are scored on a three-level scale (basic, intermediate and advanced) and weighted according to their relative importance in the context of GT students' skill development. These criteria are Improvement of Cognitive Skills (35%), Effective Knowledge Acquisition (30%), Engagement and Motivation (20%) and Development of Digital Competences (15%). The validity and reliability of the rubric has been tested through a validation process with education experts and previous case applications [2,19]. For more information on our rubric and the format we use, please see the following link:
https://doi.org/10.5281/zenodo.13624016

Throughout the evaluation process, the rubric facilitated a structured assessment of student performance across multiple dimensions. Key performance indicators such as win rate, leaderboard position and strategy effectiveness provided quantitative insights into students' competitive performance. Qualitative assessments, including academic progress and social skill development, were also included to ensure a holistic assessment of each student's growth and potential in eSports. The use of the rubric facilitated

a nuanced understanding of how the eSports programme supported the educational goals of gifted students, highlights and areas for improvement.

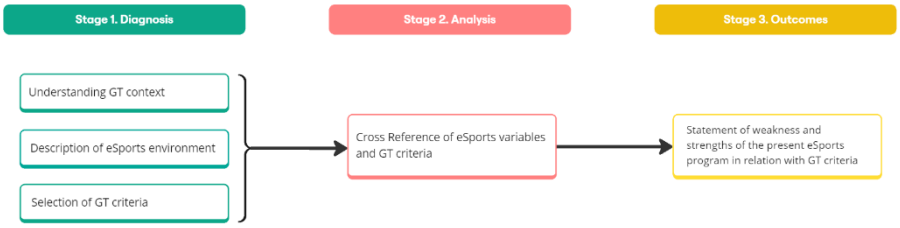

Fig. 1. ESports rubric development.

4 Results

4.1 Case study

The Tecnologico de Monterrey's national eSports programme is an integral platform that enables high-performance videogame training at a competitive level in several campuses of the university network. At the Guadalajara campus, the eSports facility is equipped with an arena area for watching top players compete and a training area. The former has 25 gaming seats, a gaming forum for presenters, and 2 screens to watch top-level competitors. The training area is equipped with 20 high-performance Alienware computers and a main screen for coaching and classes, where games such as League of Legends, Fortnite, Valorant, Rocket League, Clash Royale and Overwatch can be accessed. The programme works in two ways, competitive and recreational. The representative teams compete in national and international tournaments such as CONADEIP, CONDDE, Universiade and the invitational tournaments of the Association of Pacific Rim Universities. On the formative side, theoretical and practical classes are given to train students and recreational tournaments are organised.

The Guadalajara campus' representative team is made up of students from a variety of backgrounds, including computer engineering, medicine, design and biotechnology, with an average tenure of three years. Recruitment takes place through local tournaments organised by a student group, followed by tryouts and national scouting. Selected players undergo daily training (scrims), theory classes and game reviews to improve strategy and performance. In addition, players' academic performance is monitored monthly in conjunction with their mentors.

Players take part in activities such as training sessions, strategy meetings, video reviews, tournaments and meetings with nutritionists and sports psychologists. They also participate in volunteer activities and social events to develop cognitive and social skills. Performance is assessed using a detailed rubric and an online platform that generates weekly reports. Key performance indicators include winning percentage, ranking

position, average points per game and strategy effectiveness. This comprehensive approach allows for complete player development both in and out of the game.

The main limitations of the programme include recruitment challenges due to a lack of professional talent willing to join a university team, leading to a reliance on local talent and a focus on training. In addition, the insufficient budget allocated by the institution for a team of specialists makes it difficult to carry out the tasks, requiring extra working hours for proper planning. Considerations such as scholarships, nutritional support and incentives are crucial to ensure the full development of the programme. In addition, athletes' availability is limited by their academic workload, which restricts their training and work schedules.

4.2 Evalution of eSports in GT Education

The evaluation shows that Tecnologico de Monterrey's eSports programme supports the development of important skills for GT students. By promoting cognitive skills, knowledge acquisition, motivation and digital literacy, the programme addresses the educational needs of GT students. Gifted learners require enriched educational environments that challenge their intellectual abilities, stimulate their curiosity and develop their talents in a holistic way [20]. The programme's approach of integrating theoretical and practical learning, as well as competitive and recreational activities, provides a comprehensive platform for the holistic development of gifted students.

In terms of cognitive skill development, the programme emphasises the importance of making quick decisions in high-pressure scenarios. As stated, "Decision-making: In fast-paced and competitive games such as e-sports, players need to make instant decisions that can affect the outcome of the game". For effective knowledge acquisition, the programme offers theoretical classes that cover both individual and team topics. It is mentioned that these classes "address individual and team topics, providing players with information on game updates and strategic plans". In terms of motivation and commitment, it is highlighted that "workshops and training sessions are organised on topics such as leadership, effective communication, teamwork and time management to help players grow both inside and outside the game". These initiatives foster a strong sense of commitment and personal development among students. Finally, in terms of developing digital competence, the programme provides a dedicated space where "our representative teams train and the student community can use the facilities for recreational purposes". This access promotes the development of digital literacy through practical, hands-on experience in a supportive environment.

What skills does the eSports programme develop that align with the GT framework? Developing teamwork and social skills through participation in eSports teams involves collaboration, effective communication, leadership and teamwork, skills that are important for Gifted individuals in their personal and professional development. Finally, the eSports programme stimulates creativity through problem solving and game strategies, which are necessary for the GT in their personal and professional development.

A notable feature of this programme is that it takes a holistic approach to developing these skills. The focus is not only on time spent playing, but also on addressing potential risks such as lack of socialisation, gaming addiction and lack of supervision. The eSports team consists of a mentor who monitors the students' grades, a nutritionist who helps them with their physical health, and a coach who guides them in competitions. This makes the programme more comprehensive and competitive than others that do not pay as much attention to the students' well-being.

What are the limitations of the eSports programme in identifying and developing the potential of GT students?
The Tecnologico de Monterrey eSports programme ensures accessibility and encourages the participation of a diverse student body. It is designed for all types of students without requiring a specific test to identify their profile. The programme is not necessarily personalised according to the student and doesn't use the data collected in relation to academic performance to identify and promote potential GT students. The use of these data could help to identify certain cognitive skills developed by the students during the programme, as "video games show a weak correlation with intellectual and creative characteristics, but can be used as an alternative tool to assess skill levels" [21]. Structurally, this eSports programme is robust, providing a space that nurtures cognitive, physical and emotional skills without limiting the development of potential.

The detailed evaluation results with the rubric are presented in the following link: https://doi.org/10.5281/zenodo.12588267

5 Discussion

a) ESports programmes can develop meaningful skills for GT individuals. As the analysis of the eSports programme at a Tecnologico de Monterrey campus shows, eSports can help develop meaningful skills for GT students. The result is in line with studies by Larsen [22] and McCarthy [23], who emphasise that eSports promotes collaboration, communication and team cohesion, especially in games that require teamwork. In fact, the programme has the potential to develop the socialisation skills of GT students, one of the areas of greatest opportunity for this profile of individuals, according to Baranova et al [24]. Thus, not only can eSports programmes improve critical skills for GT individuals, but they also have considerable potential to strengthen their socialisation skills, addressing a key area of opportunity for growth.

b) Videogame interaction alone is not sufficient to identify GT profiles. As the process used to identify the GT criteria, paired with the eSports programme, shows, video games are only part of the various factors that make it possible to construct a GT profile. Although this type of programme can be considered within GT education, it is not the only element that identifies this type of student. This resonates with Margolis' assertion that video games can only partially help in diagnosing ability: “Video games show a weak correlation with intellectual and creativity characteristics but can be used as an alternative tool to assess skill levels” [21]. Overall, while video games can contribute

to the assessment of TG profiles, they need to be combined with other tools and techniques to provide a comprehensive assessment.

c) In-house teacher training can improve the recruitment of GT profiles. Based on the interview with the head of the representative eSports team, it became clear that there are real challenges in recruiting external experts in high-level endurance eSports. This is in line with the view that teacher training should address the need for differentiated teaching strategies and the use of challenging tasks to develop the potential of gifted learners [25]. Therefore, effective in-service teacher training plays an important role in the recruitment and development of GT profiles, ensuring that teaching strategies are adapted to meet the needs of such students.

6 Conclusions

This study sought to explore the intersection between eSports and GT student profiles in the context of a flagship eSports programme at Tecnologico de Monterrey, Guadalajara campus. As a result of the analysis of selected criteria associated with GT profiles in relation to the eSports programme activities in question, the following findings were identified: a) eSports programmes can develop meaningful skills for GT individuals. b) video game interaction alone is insufficient to identify GT profiles. c) internal teacher training can improve the recruitment of GT student profiles.

Practical implications of this study suggest that the inclusion of eSports in educational settings could help to develop core skills such as teamwork, strategic thinking and problem solving in GT individuals. In addition, academia should consider improving their teacher training programmes to better support and identify GT students through eSports. For research, it highlights the importance of exploring the specific ways in which eSports can promote the cognitive and social skills of GT students. The interaction between eSport participation and other educational methods can be explored by researchers to understand how they collectively impact on the development of GT profiles. In addition, a better understanding of the specific characteristics and needs of GT students in eSports could inform the development of improved evidence-based educational strategies.

Limitations of this study include its focus on a single case study, which may not be generalisable to other contexts or populations. In addition, the scope of the study was limited to the activities and criteria of one eSports programme, which may otherwise exclude other contributing factors and variables. Future studies could seek to cover a larger and more diverse sample of eSports programmes in different educational settings. In addition, studies that follow the development of GT students over time with different levels of eSports involvement could provide a richer insight. Finally, it would be useful to investigate the possible negative effects of eSports, such as social isolation, in order to develop balanced and effective educational strategies.

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