

**INCLUSIVE EDUCATION THROUGH GAMIFICATION: EMPOWER: ME – I’M GAME!
AN ERASMUS + PROJECT**

**EDUCAZIONE INCLUSIVA ATTRAVERSO LA GAMIFICATION: EMPOWER: ME – I’M GAME!
UN PROGETTO ERASMUS+**



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ABSTRACT

The Erasmus+ project Empower: ME – I’m game!, involving Italy, Germany, and Turkey, explores technology’s role in inclusive education by leveraging gamification to enhance self-esteem in students with special educational needs. Increasingly employed in education, gamification fosters engagement and motivation, improving learning outcomes (Kapp, 2012). The game prototype will be tested in special education classrooms through a pre-post study assessing its impact on self-esteem.

Il progetto Erasmus + “Empower: ME – I’m game” da una collaborazione interdisciplinare tra Italia, Germania e Turchia, si focalizza sul ruolo della tecnologia nell’educazione inclusiva utilizzando la gamification per migliorare l’autostima negli studenti con BES. La gamification in educazione favorisce il coinvolgimento e la motivazione, migliorando i risultati di apprendimento (Kapp, 2012). Il prototipo di gioco sarà testato nelle classi speciali con uno studio pre-post per valutarne l’impatto.

KEYWORDS

Gamification; self-esteem; special educational needs
Gamification; autostima, Bisogni Educativi Speciali

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Introduction

The Empower:Me – I'm Game! project, developed within the framework of the Erasmus+ program (KA210-SCH-F89F9FB1), aims to enhance the self-confidence of students with special educational needs (SEN) through an innovative digital game designed for students aged 12–14. This initiative is the result of a collaboration among Italy, Germany, and Turkey, with each country contributing expertise in education, digital innovation, and inclusion.

The project is coordinated by Büro Blau (Germany), an organization specializing in media education and workshops for students with special needs.

Mamak İlçe Millî Eğitim Müdürlüğü (Turkey) and Güzelbahçe İlçe Millî Eğitim Müdürlüğü (Turkey) are involved as educational authorities with extensive experience in managing special education initiatives and coordinating related policies.

Landesverband Kinder- und Jugendfilm Berlin e.V. (Germany) participates as an expert partner in the development of educational digital tools and game-based learning environments.

Finally, the University of Salento (Italy) supports the project as an academic partner, providing expertise in special educational needs and inclusive digital learning environments.

As part of the project, the University of Salento conducted an extensive literature exploration on the development of self-esteem, with a specific focus on SEN students. This research serves as the scientific foundation for the project design, ensuring that the digital game is based on evidence-based principles supporting students' emotional well-being and learning experiences.

Moreover, the University of Salento contributed by outlining guidelines for the development of an accessible and inclusive digital environment.

These findings were shared with partner organizations during an intensive workshop held in Izmir, Turkey.

The workshop, which lasted eight days, brought together an interdisciplinary team of experts along with students of game development and education, who collaboratively worked to develop four game prototypes through a structured process based on design thinking methods.

1. Self-Esteem in Students with Special Educational Needs: Challenges and Educational Implications

It is widely demonstrated that students with special educational needs (SEN) exhibit lower self-esteem levels than their peers (Alesi, Rappo & Pepi, 2010, 2014; Hall, Spruill & Webster, 2002). This is attributed to lower confidence in their abilities (Elbaum & Vaughn, 2001; Gurney, 1988), academic failures, negative feedback received in school settings, and the implementation of defensive strategies such as self-sabotaging (self-handicapping) and avoidance behaviors when faced with tasks perceived as difficult. These factors contribute to a negative self-concept and a sense of inadequacy (ibid.).

One of the main causes of low self-esteem in students with SEN is poor inclusion within peer groups (Douma et al., 2024). Social inclusion is closely linked to self-evaluation; as highlighted by Leary et al. (1995), self-esteem functions as a “sociometer”, where individuals with high self-esteem tend to have better social relationships. The lack of recognition and adequate support can foster feelings of inadequacy and social anxiety, leading to reduced engagement in learning and interpersonal relationships (Sheykhjan, Jabari & Rajeswari, 2014). This, in turn, can result in emotional distress, demotivation, and an overall decline in well-being.

Children and adolescents with ASD often struggle with social communication and peer relationships, which can significantly impact their self-esteem (Capps, Sigman, & Yirmiya, 1995). Difficulties in interpreting social signs and experiencing social rejection or bullying may lead to lower self-concept (Humphrey & Hebron, 2015). Structured social skills training can enhance self-perception and confidence in students with ASD (Yuen et al, 2023).

Students with SLD, including dyslexia, dyscalculia, and dysgraphia, often face repeated academic failures and negative feedback, which can lead to feelings of inadequacy and diminished self-worth (Mugnaini et al., 2009). ICD-10 describes emotional problems, low self-esteem, and problems in peer relationships as common associated features of reading disabilities, and DSM-IV reveals the possibility of elevated rates of depression and dysthymia. Research has indicated that students with SLD tend to exhibit lower self-esteem compared to their typically developing peers, particularly in academic self-concept (Zelege, 2004). Students with dyslexia tend to attribute their academic success to external factors rather than to their own abilities, reinforcing the concept of learned helplessness (Peterson et al, 1993). Research has shown that these learners often credit their achievements to external elements, such as teacher quality, rather than recognizing

their own intelligence or effort as key contributors. Consequently, they perceive success as something beyond their control, which suggests a weak internal locus of control and a heightened sense of personal inadequacy (Humphrey et al., 2002). This cognitive pattern is particularly concerning, as studies have established a connection between learned helplessness, attributional style, and low self-concept (Butkowsky & Willows, 1980). The most usual interventions to mitigate this self-image are individualized support, metacognitive strategies, and strength-based approaches (Nasika & Thoma, 2024; Abu Omar et al., 2024).

ADHD is characterized by inattention, impulsivity, and hyperactivity, often leading to challenges in academic performance and social interactions. These difficulties frequently result in negative self-perception and reduced self-esteem (Cook et al., 2014). Children and adolescents with ADHD may experience higher levels of criticism from teachers, peers, and parents contributing to feelings of frustration and incompetence (Wiener & Daniels, 2016). Studies suggest that cognitive-behavioral interventions (Antshel & Olszewski, 2014) and self-regulation training (Guderjahn et al., 2013) can significantly enhance self-esteem in students with ADHD.

Creating learning environments that promote success, recognition of progress, and social integration can help students with SEN develop a positive self-image, enhance psychological well-being, and support personal growth. Students with SEN generally exhibit significantly lower global self-esteem than their peers without SEN. While they may maintain good social relationships, they often experience higher levels of psychological distress (Ng et al., 2024). The type of disability significantly influences self-esteem levels: for instance, students with physical and sensory disabilities tend to display higher intrinsic motivation and better psychosocial outcomes, often comparable to those of their peers without SEN. Conversely, students with cognitive and emotional difficulties exhibit lower levels of both academic and global self-esteem (Ng & Boey, 2024).

A study conducted on students with dyslexia (Zupardo et al., 2019) revealed lower global self-esteem compared to their peers without Specific Learning Disorders (SLD), particularly in academic contexts. Similarly, children and adolescents with intellectual disabilities (ID) tend to report lower self-esteem levels than their peers without ID (Syropoulou et al., 2021; Park & Park, 2019). Previous evidence has also shown that low self-esteem in individuals with intellectual disabilities is associated with higher perceived stigma, lower life satisfaction, and difficulties in social integration (Paterson et al., 2012; Stanković & Milačić-Vidojević, 2014).

These findings emphasize the need for targeted interventions that address not only cognitive skill development but also emotional and behavioral aspects to improve the overall well-being of students with SEN. Self-esteem plays a crucial role in social adaptation and individual well-being (Verberg et al., 2019).

2. The educational potential of Video Games

The digital world is no longer separate from the real world but is instead deeply embedded and intertwined with it, leading to what is now referred to as the “digital era”. In contemporary society, technologies are profoundly integrated into every aspect of daily life, fostering increasing permeability between the digital and physical realms and driving significant socio-cultural transformations. The concept of the self has also evolved due to the gradual dissolution of the boundary between real and virtual experiences, influenced by digital interactions through social networks, internet browsing, and instant messaging applications.

This growing interconnection necessitates a rethinking of educational methods and strategies, leveraging the potential of digital technologies, which have proven particularly effective in enhancing inclusivity within learning environments. Digital tools enable the removal of cognitive, communicative, and organizational barriers, serving as a fundamental support to ensure accessibility in school settings (Rivoltella & Rossi, 2024). They are crucial tools for breaking down obstacles and enabling inclusive learning contexts, allowing for personalized learning paths tailored to students’ needs, fostering academic success for all, and supporting the development of a positive identity and higher self-esteem.

In this framework, the concept of “gamification” – the application of game mechanics in non-game environments (Deterding et al., 2011) – has gained increasing attention. Gamification has been used in various contexts, including educational settings (Dominguez et al., 2013). This is due to the belief that gamification makes the learning experience more motivating and engaging for students, leading to an improvement in learning processes and outcomes (Kapp, 2012).

The systematic review conducted by Caponetto et al. (2014) shows that the terms gamification and education first appeared together in scientific research databases in 2011. This emergence likely reflects the rapid expansion of educational technologies (edtech) in the early 21st century, marked by the rise of e-learning platforms, serious games, and educational applications that began integrating

game mechanics to enhance student engagement. In the same period, educational platforms and applications incorporating badges, points, levels, and challenges to foster student motivation and involvement also began to spread.

During these years, Deterding et al. (2011) provided one of the earliest definitions of gamification, distinguishing between “gamefulness” and “playfulness”. While playfulness refers to an open-ended, exploratory interaction in which users experiment freely without a clear direction or externally imposed goals, gamefulness—the foundation of gamification—is characterized by explicit rules, defined objectives, and structured mechanisms that encourage achievement through codified game dynamics (ibid., p. 10). The authors identified different game elements:

- Game Interface Design Patterns: visible elements in the user interface derived from games, such as badges, leaderboards, and levels;
- Game Design Patterns and Mechanics: recurring structures in game design that shape interaction dynamics (e.g., turn-taking mechanisms);
- Game Design Principles and Heuristics: guidelines for designing engaging experiences, such as defining clear goals, providing immediate feedback, and balancing challenges and skills (e.g., progress bars);
- Game Models: conceptual models describing game structures and player experiences;
- Game Design Methods: specific methodologies for developing gamified experiences, such as playtesting and user-centered design.

The integration of these game elements into educational contexts has proven particularly effective in enhancing students’ sense of self-efficacy and control over their learning processes, while reducing stress and anxiety (Rachels & Rockinson-Szapkiw, 2018; Banfield & Wilkerson, 2014; Ros et al., 2020; Malak, 2024).

Technologies are recognized as a critical environmental factor for promoting individual functioning, serving either as facilitators enabling independent living or, conversely, as barriers when inadequately designed (Pinnelli, 2022). This is why they are included within the Environmental Factors in the ICF framework (WHO, 2001) and must be carefully evaluated when planning individualized educational interventions.

Within this broader context of technological innovation, video games that integrate playful and educational elements are emerging as powerful tools for developing cognitive, social, and emotional skills (Gabbi et al., 2023) through interactive and engaging experiences. Recent studies (Adachi & Willoughby, 2013; Granic et al.,

2014) confirm that video games serve not only entertainment purposes but can also promote learning and psychological and social growth, like traditional forms of play.

The frustration experienced during gameplay is temporary and manageable because players understand that time and practice will improve their skills, enabling them to tackle increasingly difficult challenges. When this sense of control acquired through gameplay extends into real-life contexts, positive impacts on self-esteem and motivation in everyday tasks are observed (Ryan & Deci, 2000; Ryan et al., 2006).

Videogames offer a flexible and appealing method to enhance self-esteem in students, particularly for those with special educational needs (Paay et al., 2018). For these students, who often experience feelings of inadequacy and demotivation due to academic challenges, video games offer protected environments where learning is possible without fear of judgment and provide opportunities to make mistakes, improve skills, and achieve personal goals, thereby strengthening students' self-perception and confidence. The ICT environment creates favorable conditions because it is visually structured, predictable, characterized by simplified and regular sequences, free of affective nuances, and devoid of the stressors typical of natural settings. Moreover, fosters opportunities for collaboration and social interaction, channels communication through a single medium, supports sustained attention, and strengthens intrinsic motivation through timely and coherent feedback and positive reinforcement (Pinnelli, 2022).

3. From theory to practice: a collaborative approach to game development

Based on these theoretical and scientific foundations, an intensive camp was organized in Izmir (Turkey), where seven pedagogy students from the University of Salento, seven German students specializing in game development, special education teachers, and education and technology experts collaborated to develop four game prototypes.

After establishing a shared conceptual basis, participants were divided into 4 interdisciplinary working groups, each tasked with exploring different aspects of the game projects (content development, game mechanics, user experience (UX), user interface (UI), and universal design elements). The entire process was guided by the design thinking methodology, an approach that emphasizes understanding users' needs, redefining problems, and creating effective solutions through five key

phases: empathizing with users, defining the core issues, ideating creative solutions, prototyping, and testing.

Throughout the design and development game prototypes process, educators were responsible for ensuring that each prototype effectively addressed the specific needs of students with special educational needs (SEN) and adhered to the accessibility and inclusion guidelines established in the previously outlined research.

The prototype development process was articulated in a series of structured steps. It began with socialization activities designed to build team and foster a collaborative atmosphere among participants. These activities included personal presentations about gaming interests and experiences, first in pairs, then in triads, and finally in larger groups, with the aim of identifying shared elements and complementary perspectives. The second step consisted of collective discussions focused on expectations regarding educational games, providing a foundation for a shared vision of the desired outcomes. Subsequently, a redesign phase activated the creative resources of each group: pedagogy students and teachers redefined the rules and mechanics of well-known games (e.g., chess), introducing new variables and inclusive dynamics, while software developers worked on modifying and adapting portions of standard game code to enable greater personalization and accessibility. In the final step, interdisciplinary teams—composed of pedagogical experts, designers, and developers—collaborated to prototype original gaming solutions, combining educational insight with inclusive design and technological functionality.

Guidelines including multimedia instructional principles (Mayer, 2017), learning principles from video game design (Gee, 2007), and specific accessibility suggestions for digital environments, such as: the optimization of cognitive load through coherent and intuitive multimedia communication; task design based on progressive complexity; the application of universal design principles for readability and accessibility; systematic feedback and reinforcement mechanisms; scaffolding of metacognitive processes; and promotion of engagement through motivational strategies.

In this framework, the result was the successful creation of 4 distinct prototype games, each addressing different educational challenges, intended for use in educational contexts.

1. Visual Novel for teenagers with mild autism and/or ADHD: this game, structured as a visual novel, guides a teenager aged 12–14 through daily

life challenges. Players make decisions that influence the course of the day, with a “rewind” feature enabling them to revisit choices and learn from consequences.

Team ensured that the game design reduced cognitive load, maintained a safe environment for risk-taking (psychosocial moratorium principle), and adapted to the executive functioning challenges typical of ASD and ADHD profiles. For these reasons, the game will adhere to several key principles: coherence principle (instructions are simple, direct, and free of distractions), signaling principle (key choices and important information are emphasized visually with colors, bold text, icons), predictability and structure (routine sequences structure the beginning and end of each scenario).

2. Visual Novel focusing on social skills: this visual novel immerses players in the experience of a protagonist facing social skill difficulties, encouraging empathy and support.

Team verified that the game encouraged self-knowledge, offered emotionally safe spaces, and ensured readability and accessibility for players with potential social communication challenges. For these reasons, the game will adhere to several key principles: multimodality principle (texts are supported by images and simple language to aid comprehension), universal Design (high-legibility fonts and icon), internal dialogue (players engage in reflective decision-making activities promoting metacognition and self-knowledge), affinity group principle (the narrative encourages players to identify with the protagonist and feel part of a shared community).

3. Reading game for students with dyslexia: players bring stories to life by reading aloud, reinforcing decoding skills through animated visual responses. Educators monitored that the game applied principles of multisensory reinforcement critical for dyslexic profiles, minimized cognitive overload, and sustained motivation through visual and auditory supports. For these reasons, the game will adhere to several key principles: redundancy principle (verbal reading is supported with audio-feedback with correct pronunciation to reinforce understanding), high readability (use of dyslexia-friendly fonts and high-contrast backgrounds to reduce visual stress), adaptive difficulty customization (speed and complexity can be personalized), immediate and positive feedback (reading accuracy

prompts explain pronunciation rules with positive reinforcement supporting memory and motivation).

4. Game for autonomy and social skills: inspired by MarioBros, this fun game leads a 12–14-year-old with ADHD to accomplish tasks and foster autonomy. The core gameplay involves small missions where players must accomplish specific tasks to earn coins. Players have to complete challenges and collect coins, adds excitement while emphasizing the development of individual social skills and personal accomplishment. Through these interactive experiences, the game aims to enhance autonomy in task completion while encouraging fun and self-efficacy. Educators ensured that the platform maintained an optimal regime of competence, provided frequent motivational reinforcements, and fostered autonomy without overwhelming the player, respecting executive functioning challenges typical of ADHD. For these reasons, the game will adhere to several key principles: task analysis (missions are broken down into micro-steps with clear and concise instructions), on-demand information (suggestions and guidance are available when needed), predictable structures (levels start and end with familiar visual frames and characters), motivation and engagement (progression through levels, collectible rewards, and avatar customization maintain player engagement).

Conclusions

In conclusion, throughout the project, educators act as bridge between theoretical framework and practical implementation. They ensured that each game prototype effectively addressed the cognitive, emotional, and social needs of the target user profiles, while also remaining universally accessible, inclusive, and engaging. For the education team, this process offered a valuable hands-on experience, enabling to see theory come to life in real-world applications.

The prototypes were developed with a strong commitment to design thinking, pedagogical principles, and accessibility and inclusion guidelines. This rigorous approach demonstrated the power of interdisciplinary e international collaboration in creating educational impactful digital learning tools.

Moving forward, one of the games will be chosen for further development, based on a thorough assessment of its suitability for the target audience, its capacity for

incorporating all accessibility and engagement features, and its potential for maximizing positive outcomes for students. The team of educators will continue to provide ongoing support, offering feedback to ensure the game meets the specific needs of students aged 12 to 14 with special educational needs.

Following its development, the game will be tested in Turkish and German special schools, with an evaluation of its effectiveness through a pre-post questionnaire, measuring changes in students' perceived self-esteem levels. We selected specific items from the Five-Scale Test of Self-Esteem by Pope, McHale & Craighead (1992), focusing on global self-esteem that is more fragile in SEN students. The questionnaire will be administered online to ensure anonymity, with each student assigned a unique code to track changes before and after gameplay.

This project marks a significant step toward integrating gamification and digital learning into inclusive education. It will provide foundational insights for future research, particularly on self-efficacy variables, comparing results with inclusive environments, such as Italian classrooms.

Author contributions

The article is the joint result of the work of both authors. However, specific sections can be attributed to individual authors: Stefania Pinnelli authored paragraph 2, while Francesca Baccassino authored Introduction, Conclusions and paragraphs 1 and 3.

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