

Investigating Inclusivity in Game-Based Learning: Current Practices and Multistakeholder Perspectives

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Abstract:

This study aims to examine how inclusivity measures are understood and applied in game-based learning (GBL). It considers the perspectives of various stakeholders, such as educators, game designers, and students. The focus is on creating accessible and engaging games that meet the diverse needs and characteristics of players. The methodology adopted a combination of primary and secondary data sources to pursue these aims. The primary data collection involved focus groups with educators, game designers, and students. The study employed a participatory design approach, involving multiple stakeholders in the exploration of inclusivity measures. The data collected from the focus groups, along with findings from the literature review, helped in formulating a set of inclusivity metrics for educators to create educational games that cater to diverse student needs. The obtained results emphasize the limited state of analogue GBL accessibility in scholarly and professional literature, while emphasizing the existing frameworks to be adopted by educators, designers, and publishers. Stakeholder discussions revealed themes related to inclusivity measures, including motor, sensory, and cognitive needs of players. Game designers can enhance accessibility by considering these requirements and incorporating alternative communication channels, accessible cues, adaptable gameplay options, and diversified knowledge-based requirements. In addition to inclusivity, addressing instances of exclusion, managing teams effectively, promoting inclusive communication, and incorporating gameplay limitations, educational components, diverse perspectives, and real-world applicability are discussed as important in education game design, to this extent.

Keywords: Game-Based Learning, Educational Game Design, Higher Education, Inclusivity, Diversity.

1. Context

The present study was conducted within the scope of TEGA (2020-1-UK01-KA203-079248), a project that aims to foster change in Higher Education (HE) by employing analogue Game-Based Learning (GBL) approaches for delivering consistent playfulness and reducing existing barriers and obstacles for students. The use of analogue/board/tabletop games has cost, deployment, adaptation, and player engagement advantages over digital games (Marco et al., 2012). Analogue games encourage player participation in ways that digital games do not, as players must "activate" the various game components in order for the game to function (Maratou et al., 2023; Sousa et al., 2023). Successfully employing an analogue games approach for the requirements of GBL requires recognising the needs of each student's learning process, thereby empowering teachers to meet them (Sousa et al., 2022).

This work is a research component of the TEGA Toolkit (<https://doi.org/10.6084/m9.figshare.23715942.v1>) and addresses the concepts and skills required of instructors and designers in order to accommodate player needs when designing or modding a game. More specifically, the purpose of this study is to investigate the understanding and implementation of inclusivity measures in GBL, taking into account both the current state of the art and the perceptions of multiple stakeholders – including educators, game designers, and students – while emphasising the importance of designing accessible and engaging games that cater to a wide variety of player needs and characteristics.

2. Introduction

GBL has become increasingly pertinent in the field of education in the 21st century, primarily as a result of the changing educational environment and advancements in technology (Qian and Clark, 2016). Although digital games frequently receive more attention, it is important to recognise the potential of analogue games. Analogue games, encompassing board games, card games, and tabletop role-playing games, possess distinct advantages that render them particularly pertinent within modern educational settings (Pomichal et al., 2023; Sousa and Bernardo, 2019).

An important benefit of analogue games lies in their capacity to facilitate in-person social interaction and collaborative engagement. In an era characterised by heightened interconnectivity facilitated by digital devices, analogue games present a valuable avenue for students to actively participate in substantive, face-to-face interactions with their fellow peers (Fjællingsdal and Klöckner, 2020; Wu et al., 2014; York, 2020). This not only facilitates the advancement of social and emotional growth (Dell'Angela et al., 2020; Hromek and Roffey, 2009) but also fosters the development of crucial communication, negotiation, and teamwork abilities that are in high demand in the contemporary labour market (Reuter et al., 2021).

Analogue games also offer a concrete and hands-on educational experience. The act of physically manipulating cards, tokens, and game pieces by players can effectively enhance sensory engagement and reinforce learning through hands-on interaction. The tactile nature of analogue games can offer significant advantages for individuals who excel in a hands-on and immersive learning setting (da Rocha Tomé Filho et al., 2019; Tsong et al., 2012).

Additionally, analogue games frequently foster the development of strategic thinking, problem-solving skills, and the ability to make critical decisions (Kaya et al., 2017; Mustata et al., 2019). In order to advance or achieve success, players are required to engage in the process of analysing the current state of the game, evaluating various options, and subsequently making well-informed decisions. The cognitive abilities discussed are of great significance in the contemporary era, as individuals frequently encounter intricate challenges and must engage in critical thinking to effectively navigate a world abundant with information.

As understood through this introduction, the current discourse surrounding analogue GBL extensively examines its complete pedagogical potential. However, it is crucial to acknowledge the dearth of attention given to diversity, inclusion, and accessibility concerns within the research conducted in this domain. In this particular context, the comprehension and execution of inclusivity measures have emerged as pivotal considerations. The principal aim of this study is, therefore, to examine the comprehension and implementation of inclusivity measures in GBL. Through a comprehensive analysis of contemporary advancements in the field, this study endeavours to identify the prevailing lacunae and constraints in existing knowledge. Furthermore, the primary objective of this research is to develop a comprehensive understanding of the perspectives held by various stakeholders, including educators, game designers, and students, with regards to inclusivity in GBL.

3. Methodology

This study employed a combination of techniques, utilizing both primary and secondary data sources, to investigate the necessary and current measures implemented to promote inclusivity within the higher education levels ranging from four to seven. The present study incorporates secondary data, which encompasses theoretical frameworks derived from existent literature and industry best practice. By adopting this approach, the study was able to establish a solid foundation in well-established theories and draw upon up-to-date knowledge. The primary data collection process consisted of three distinct stages, with the initial stage involving focus groups, with a total of 35 participants. The focus groups were carried out for a duration of three weeks and comprised three distinct groups of participants: educators, game designers, and students. The rationale for dividing the participants had two primary components. Initially, the inclusion of diverse viewpoints from both providers (educators and game designers) and recipients (students) was facilitated. Furthermore, it served to mitigate the potential for undue influence of more knowledgeable participants, namely educators, on the perspectives of less experienced participants, specifically students.

Each and every participant involved in the focus group possessed a minimum of one prior experience in the domains of teaching, designing, or engaging in the process of learning through game-based methodologies. The study received approval from the ethics committee of London South Bank University. The focus group meetings were conducted in a face-to-face format for students and game designers, while virtual platforms were utilized for educators. The study employed a participatory design approach as its research design, wherein stakeholders were actively involved in the exploration of inclusivity measures. The focus group discussions yielded significant data regarding the viewpoints and perspectives of the stakeholders engaged in the study. The aforementioned data, in conjunction with the findings derived from the literature review, played a crucial role in shaping the formulation of a comprehensive set of inclusivity metrics. These metrics were specifically devised to aid educators in the creation of educational games that effectively address the varying requirements of a diverse student population.

This study sought to offer practical guidance and tools for educators in the design of inclusive educational games by utilising a participatory design approach and integrating insights from focus group discussions and existing

literature. The primary objective was to optimise the educational encounters of students at the tertiary level, specifically those in the fourth to seventh years, through the identification and resolution of their varied needs, while concurrently fostering an environment of inclusivity within the context of GBL (Bryman and Bell, 2021). Each session had a duration of approximately one hour.

4. Results and Discussion

4.1. State of the Art in Analogue Gaming Accessibility

According to Heron et al. (2018), the subject of accessibility in board games has received limited attention in scholarly and professional literature. These authors' approach – *Meeple Centred Design: A Heuristic Toolkit for Evaluating the Accessibility of Tabletop Games* – represents one of the first and most significant ones in this field. It is a framework for assessing the accessibility of board games. The adoption of this framework by designers and publishers would be a step forward in addressing accessibility and inclusion. However, the authors acknowledge that a more sustainable solution would require the development of compensatory regimes that utilize digital and analogue technology.

Later, Sousa et al. (2023) found that accessibility and inclusion were not frequently approached in a systematic literature review on analogue GBL. Despite the perception that the board game community is particularly welcoming and inclusive, it seems that these aspects are not a major focus in research. However, the study also highlighted the potential of board games in promoting a sense of inclusion in learning processes. This notion was corroborated by the studies of Sousa (2020) and Veldthuis et al. (2021), based on their potential to cultivate a sense of inclusivity within the realm of learning. This can be attributed to their ability to facilitate the development of a wide range of soft skills, as well as their capacity to accommodate individuals who may not possess a particular disability or condition, such as those who are introverted or possess divergent thinking abilities.

Through a more empirical lens, and by interviewing 18 experts from four European countries, Maratou et al. (2023) showed the existence of heterogeneous perceptions regarding the implementation of inclusivity measures in GBL, since each interviewee had a different way to answer the question “What measures of inclusivity are being practiced within GBL classes?”. Some did not see inclusivity as a problem or had not needed to consider it before. Others had to deal with very specific problems faced by students, and yet others described cultural and language differences as the biggest issue. As such, each participant had to consider inclusivity from a different angle, depending on their specific classroom. For example, some interviewees discussed using symbols, rather than letters, to be more inclusive of students with dyslexia. This differs from the approach taken by others, whose main issue was related to cultural differences. They advocated that educators must be flexible and creative in order to solve these issues. One would imagine reducing the reliance on words by using symbols could be a pragmatic example of this and may also help with the issue they mention. The overall picture from interviewees shows how every class-room is different, and each will face its inclusivity issues. GBL itself is a good inclusivity measure, reducing the barriers between people and allowing increased collaboration.

TEGA's first approach to accessibility and inclusion was through the development of a conceptual framework based on the implementation of the different disability paradigms to the field of games and GBL. The framework was based on a study aimed to explore accessibility in analogue gaming and develop an inclusive methodology for the TEGA project. The results showed that game designers need to be aware of disability paradigms and consider contextual factors in making tabletop games accessible. It also emphasized how the different dimensions of accessibility needs, such as motor, sensory, and cognitive, can be addressed through practical features in gaming. Inclusive design involves including the voices and representations of players, both with and without disabilities. Therefore, a conceptual framework for incorporating accessibility needs in analogue gaming was proposed, centered around inclusive design and intersectional accessibility (Sousa et al., 2022).

4.2. Inclusivity Measures in the Focus Group Discussions

Games are selected for utilisation in TEGA instruction within the classroom, taking into consideration the specific needs and characteristics of the intended student population. Educators have the option to use a diagnostics package that encompasses suitable rubrics in order to ascertain the cohort's inclinations towards their roles as players and learners. The rubrics aim to cultivate a comprehensive view of players and learners and to facilitate the identification of appropriate outcomes for the subject and syllabus under investigation, based on their specific needs (Sousa et al., 2022).

The focus group discussions yielded a number of recurring themes pertaining to the utilisation and implementation of GBL. The subject of assessment emerged as the most prevalent theme, as participants engaged in discussions regarding the delineation of failure, the utilisation of games for teaching and evaluating soft skills, the assessment of specific soft skills, the implementation of peer assessment, the adoption of assessment frameworks, the suitability of games as assessment tools, and the execution of comprehensive evaluations of learning outcomes. The participants in the study discussed their personal encounters with exclusion from games, proposed strategies to promote inclusivity, highlighted the significance of efficient team coordination and communication, and examined challenges such as language barriers and insufficient attentiveness in educational settings that incorporate GBL. This theme emerged as the second most prominent topic of discussion among the participants. The participants articulated several key themes during the discussion. One theme that emerged was the importance of establishing well-defined gameplay restrictions. Another theme was the incorporation of educational elements within games. Additionally, participants emphasised the value of embracing diverse ideas and perspectives. Furthermore, participants recognised the significance of fun and enjoyment in educational games. Lastly, the creation of meaningful connections between game experiences and real-world contexts was highlighted as another important theme.

In a second phase of the qualitative analysis, the team focused only on the discussed aspects related to the different inclusivity measures. The obtained results are aligned with this premise and allowed the project to systematize a set of measures considered as relevant by the different stakeholders in the analogue GBL process — educators, game designers, and students — identified through the analysis of the focus groups, and represented in Table 1.

Table 1: General inclusivity measures and related aspects discussed by the stakeholders in the focus groups

General inclusivity measures	Discussed Aspects
Motor needs	Size of cards
	Token shape
	Regularity of piece manipulation
	Ease of communicating instructions
	Physical acting
	Paper money
	Number of tokens
	Size of game board elements
Sensory needs: visual	Reading level required
	Lying and/or bluffing
	Communication of strategy
Sensory needs: auditory	Audibility

	Lying and/or bluffing
	Communication of strategy
	Need for audible communications
Cognitive needs	Reading level required
	Game state complexity
	Memory requirements
	Game flow
	Number of token combinations
	Synergy of rules
	Scoring
	General knowledge requirement (e.g. trivia)
	Multitasking requirements

According to the obtained results (Table 1), a number of recurring themes were identified in relation to the implementation of inclusive measures and their influence on different facets of gameplay. The participants engaged in a comprehensive discussion regarding the motor, sensory, and cognitive needs of players.

Multiple aspects pertaining to the motor requirements in gameplay were discussed. The factors considered in the evaluation encompassed various aspects, such as the dimensions of cards and tokens, the frequency of piece manipulation, the effectiveness of communicating instructions, physical interaction, the utilisation of paper currency, the quantity of tokens, and the dimensions of game board elements. The significance of taking into account these factors was underscored by the participants, as it is crucial for promoting inclusivity and facilitating the engagement of players with diverse motor abilities. By taking into consideration these various elements during the process of game design, developers have the ability to craft inclusive and captivating experiences that cater to a wide spectrum of players.

Regarding sensory needs, most specifically related to visual abilities, the participants emphasised the significance of addressing sensory needs related to the visual modality. This encompassed the assessment of the dimensions of game board components in order to guarantee optimal visibility for all participants. The discussion also encompassed the reading proficiency necessary for understanding game components or instructions, as well as the inclusion of elements involving deception and/or bluffing, and their dependence on visual cues. Additionally, an investigation was conducted on the transmission of strategies using visual modalities.

Still on sensory issues, participants explored needs related to hearing. This included the perceptibility of sounds or cues related to the game emerged as a significant factor to be taken into account. The attendees engaged in a discourse regarding the impact of auditory components on the dynamics of gameplay, with a specific focus on the role of deception and/or misrepresentation. The examination also encompassed the utilisation of audible communication for the transmission of strategies, as well as the assessment of the necessity of audible communication within the game.

As a last category, the participants emphasised various cognitive aspects related to players' intellectual functioning. The discourse revolved around the requisite reading proficiency necessary for comprehending game regulations and directives. The intricacy of the game's state, encompassing decision-making and information processing, was taken into account. The evaluation encompassed memory demands, such as the retention of rules or game states. The analysis focused on the progression of the game, encompassing the seamless transitions between different phases. The study also examined various aspects including the quantity of token combinations, the interplay of rules, the mechanisms for scoring, the level of general knowledge required, and the demands for multitasking.

The themes that have been identified through the focus group discussions offer valuable insights into the measures of inclusivity that are essential for the design of inclusive games. Game designers have the potential to enhance the accessibility and engagement of their creations by taking into account the motor, communication, sensory, and cognitive requirements of a wide array of players. It is of significance to acknowledge that the findings obtained highlight the validation of the accessibility and inclusion conceptual framework formulated by Sousa et al. (2022), as the measures employed can be regarded as indicative of intersectional accessibility. There exist various measures that, despite being assigned to a specific category, may encompass multiple needs, thereby demonstrating the importance of investigating how the personal context and distinctiveness of each player are shaped by the individual and cumulative aspects of their characteristics. Lying and/or bluffing in analogue GBL can be seen as a paradigmatic example of this intersectional nature, having a significant impact on inclusivity, and intersecting with various categories such as communication, sensory needs, cognitive needs, and general knowledge requirements. Effective communication skills are essential for deceiving opponents or conveying false information convincingly, which can intersect with sensory needs like visual and auditory processing. Visual cues, such as facial expressions or body language, are often used in lying and bluffing, posing challenges for individuals with visual impairments. Similarly, auditory cues like tone of voice or speech patterns play a role, making it difficult for those with hearing impairments to perceive and interpret them. Cognitive skills like strategic thinking and memory are necessary for successful lying and bluffing, but individuals with cognitive needs may struggle with these aspects. Additionally, leveraging general or specific knowledge is often required, which can be challenging for individuals with lower general knowledge levels. To create inclusive experiences, game designers should consider alternative communication channels, accessible visual or auditory cues, adaptable gameplay options, and diversified knowledge-based requirements. Moreover, the specific case of lying and/or bluffing can also be seen as a matter of emotional accessibility, according to the Meeple Centered Design Heuristic Toolkit (Heron et al., 2018). Lying and bluffing in games can also be a matter of emotional accessibility. It involves understanding and interpreting the emotions of other players, regulating one's own emotions, and navigating complex social dynamics. This happens since individuals diagnosed with emotional conditions, such as autism spectrum disorders or social anxiety, may encounter difficulties in engaging in and effectively regulating this particular aspect of gameplay. Therefore, it is important to mention that, by incorporating the concept of emotional accessibility into the process of game design, developers have the ability to construct interactive experiences that facilitate emotional comprehension, management, and inclusive interpersonal interactions, thereby guaranteeing a more comprehensive and gratifying experience for players with varying emotional requirements.

In a broader manner, participants engaged in discussion of diverse aspects of inclusivity, encompassing the identification and resolution of instances of exclusion, the establishment and enforcement of protocols to guarantee inclusivity, the proficient management of teams, and the active promotion of inclusive communication. Furthermore, the significance of language and listening was underscored as crucial elements in the development of inclusive GBL experiences.

The discussions also highlighted the significance of incorporating inclusivity into game design, which involves taking into account factors such as gameplay limitations, integration of educational components, embracing a wide range of perspectives, and determining optimal group sizes. The importance of ensuring that gaming experiences are enjoyable and applicable to real-world situations was also highlighted.

The focus group discussions in this academic paper explored the advantages, difficulties, and considerations associated with analogue GBL in educational environments. The discussions highlighted the benefits of games in enhancing communication, comprehension, and engagement. They also emphasized the importance of evaluating learning outcomes, promoting inclusivity, and designing games deliberately to optimize the effectiveness of GBL. The discussions provided insights into various aspects of GBL, including visualization, teamwork, real-world applications, and the qualities of a good game. The findings also showed that soft skills

and specific subjects like project management and information technology can be effectively taught through games. Overall, the discussions offered valuable perspectives on the factors and components that contribute to the success of GBL in educational contexts.

5. Conclusion

The aim of the present study was to explore the understanding and implementation of inclusivity measures in GBL – considering both the existing state of the art and multistakeholder perceptions – while emphasizing the importance of designing accessible and engaging games that cater to a wide range of players' needs and characteristics.

In conclusion, the state of the art in analogue gaming accessibility is still relatively limited in scholarly and professional literature. However, there have been significant advancements in the field, such as the development of frameworks for evaluating the accessibility of board games, like Meeple Centered Design (Heron et al., 2018). It is crucial for designers and publishers to adopt these frameworks to promote accessibility and inclusion in board games. While accessibility and inclusion have not been extensively studied in the board game community, there is potential for board games to promote a sense of inclusion in learning processes (Sousa et al., 2023). Analogue games have been found to cultivate soft skills and accommodate individuals with different abilities or characteristics, such as introverts or those with divergent thinking abilities. Empirical research has shown that perceptions of inclusivity measures in GBL vary among educators. Inclusivity needs to be considered from different angles depending on the specific classroom and the challenges faced by students. Flexibility and creativity are essential in addressing inclusivity issues, whether they are related to specific disabilities, cultural differences, or language barriers.

Regarding the perceptions of the different stakeholders, the focus group discussions revealed recurring themes related to the implementation of GBL, including assessment, inclusivity, gameplay restrictions, educational elements, diverse ideas and perspectives, and the connection between game experiences and real-world contexts. The analysis focused on the discussed aspects of inclusivity measures, which allowed for the identification of relevant measures by different stakeholders in the GBL process. These measures encompassed motor, sensory, and cognitive needs of players. Motor requirements included factors such as dimensions of game components, physical interaction, and the utilization of paper currency, which are important for promoting inclusivity and engaging players with diverse motor abilities. Sensory needs, particularly visual and auditory, were also discussed, emphasizing the importance of optimal visibility, reading proficiency, and audible communication in gameplay. Cognitive aspects, such as reading proficiency, decision-making, memory demands, and multitasking, were also considered.

The identified themes provide valuable insights into the measures of inclusivity that are essential for designing accessible games. Game designers can enhance the accessibility and engagement of their creations by considering the motor, sensory, and cognitive requirements of players. It is important to acknowledge the intersectional nature of accessibility, as different measures may encompass multiple needs. To create inclusive experiences, game designers should consider alternative communication channels, accessible visual or auditory cues, adaptable gameplay options, and diversified knowledge-based requirements.

In addition to inclusivity, discussions also highlighted the importance of addressing instances of exclusion, establishing protocols for inclusivity, managing teams effectively, promoting inclusive communication, and incorporating gameplay limitations, educational components, diverse perspectives, and real-world applicability into game design.

Overall, the findings emphasize the need for inclusive game design that considers the diverse needs and characteristics of players. By incorporating measures of inclusivity, including motor, sensory, cognitive, and emotional accessibility, game designers can create engaging and inclusive experiences that cater to a wide range of players.

5.1. Limitations and Future Directions

The lack of accessibility and inclusivity strategies in analogue games needs to be addressed in the future. Analogue GBL can only become common practice if these needs are taken into account more broadly. Future research on accessibility and methods for achieving it through participation is crucial. There is a need to bridge the gap between industry and academia to better take into account human diversity in analogue game design. It is important to establish a clear vision for the game experience before choosing and adjusting games for educational use. Different students have different preferences as players, so educators should develop an

understanding of these preferences and choose a balance of game characteristics that is ideal while still maintaining the game's distinctive vision. The study has limitations and further research using empirical methodologies is needed. The study also has limitations in considering accessibility models and practices from the board game industry. Bridging the gap between industry and academia is necessary to ensure proper implementation of accessibility measures and consideration of human diversity in analogue game design. Educators should have a basic understanding of player profiles and strive to create an inclusive and adaptive learning environment.

Furthermore, it is pertinent to examine the premises pertaining to the conceptual frameworks surrounding the accessibility and inclusivity of analogue games, such as the ones developed by Heron et al (2018) and Sousa et al. (2022). This can be achieved through conducting comprehensive studies that enable a more extensive validation of these assumptions. Such research can also exert influence on policy-makers, urging them to recognise analogue games as a legitimate tool for driving educational transformation.

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