GAMIFICATION AS A SOCIAL PHENOMENON AND GAMIFICATION HEURISTICS CRITERIA FROM SOCIAL SCIENCES PERSPECTIVE

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Abstract

The widespread adoption of gamification across various domains necessitates robust methodologies to gauge its impact and efficacy. This study delves into heuristic evaluation techniques utilized in a European Union project where partners assessed gamification applications focused on cultural heritage in their respective countries. Notably, this study assesses gamification as a social phenomenon and evaluates gamification assessment criteria in practice for five gamification implementations that reflect Türkiye's cultural heritage. Recognising gamification as a social phenomenon, this research evaluates seven key dimensions: collective participation, cultural integration, social interaction, motivational dynamics, technological mediation, dynamic evolution, and observability/measurability. Assessment criteria, categorised into intrinsic, extrinsic, and context-dependent motivational heuristics, are analysed through the lens of prominent social science theories, including Self-Determination Theory, Expectancy Theory, and Goal-Setting Theory, alongside learning paradigms such as Constructivist and Experiential Learning. The findings illuminate how gamification influences user engagement and learning, offering significant implications for designing more effective gamification strategies. This comprehensive analysis underscores the potential of integrating robust social science theories and evaluating it as a social phenomenon to enhance the theoretical and practical understanding of gamification's role in modern societal contexts.

Keywords: Cultural Heritage, Gamification, Heuristic Evaluation, Motivational Theories

Introduction

Over the past decade, gamification - integrating game elements into non-game contexts–has emerged as a significant tool to enhance user engagement, motivation, and behaviour modification across diverse fields[1]. Its application

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[1] Jeanine Krath, Linda Schürmann, Harald F.O. von Korflesch, „Revealing the theoretical basis of gamification: A systematic review and analysis of theory in research on gamification, serious games and game-based learning," Computers in Human Behavior, 125, no.106963, (December 2021): 1-33. Kamilla Tenório, Diego Dermeval, Mateus Monteiro, Aristoteles Peixoto & Alan Pedro da Silva, „Exploring Design Concepts to Enable Teachers to Monitor and Adapt Gamification in Adaptive Learning Systems: A Qualitative Research Approach," International Journal of Artificial Intelligence in Education, 32 no: 4, (2022): 867-891.

spans education, health services, social learning, business management, and marketing, demonstrating its versatility and broad appeal[2]. As gamification proliferates, the demand for effective design and strategic implementation intensifies, prompting a surge in interdisciplinary research to optimise effectiveness[3]. Theoretical frameworks play a pivotal role in this endeavour, with over a hundred theories contributing insights into the mechanisms and outcomes of gamification[1]. Prominent are motivation theory, achievement goal theory, and flow theory, which elucidate how gamified elements can direct user actions through structured goals, immediate feedback, and appropriate complexity[4]. For instance, in workplace settings, gamification strategies emphasise cooperative over competitive interactions, supported by a causal-chain framework that aligns with organisational goals[5]. In educational contexts, frameworks like Landers' theory of gamified learning and Bedwell's taxonomy of game attributes merge with traditional learning theories to enhance student engagement and learning outcomes[6].

Given gamification's complexity and its intersection with various academic disciplines, this article poses three critical research questions:

1. Why should gamification be assessed as a social phenomenon?
2. What elements of social phenomenon should be considered to identify the dignifying side of gamification?
3. How can gamification be evaluated according to predetermined heuristic evaluation criteria?

2 Amina Khaldi, Rokia Bouzidi & Fahima Nader, „Gamification of e-learning in higher education: a systematic literature review," Smart Learning Environments, 10 no. 10 (January 2023): 1-31. Wilk Oliveira, Juho Hamari, Lei Shi, Armando M. Toda, Luiz Rodrigues, Paula T. Palomino, Seiji Isotani, „Tailored gamification in education: A literature review and future agenda," Education and Information Technologies, 28 no. 1, (2023): 373-406. Robertas Damaševičius, Rytis Maskeliūnas and Tomas Blažauskas, „Serious Games and Gamification in Healthcare: A Meta-Review," Information, 14 no. 105. (February 2023): 1-31. Staling Cordero-Brito, Juanjo Mena, „Gamification in the Social Environment: a tool for Motivation and Engagement," Paper presented at the Proceedings of the Sixth International Conference on Technological Ecosystems for Enhancing Multiculturality. (October 2018): 640-643.

3 Staling Cordero-Brito, Juanjo Mena, „Gamification in the Social Environment: a tool for Motivation and Engagement," Paper presented at the Proceedings of the Sixth International Conference on Technological Ecosystems for Enhancing Multiculturality. (October 2018): 640-643.

4 Amir Matallaoui, Nicolai Hanner & Rüdiger Zarnekow, „Introduction to Gamification: Foundation and Underlying Theories," Gamification: Using Game Elements in Serious Contexts, ed. Stieglitz, C. Lattemann, S. Robra-Bissantz, R. Zarnekow, & T. Brockmann (Cham: Springer International Publishing, 2017), 3-18.

5 Chris Perryer, Nicole Amanda Celestine, Brenda Scott-Ladd, Catherine Leighton, „Enhancing workplace motivation through gamification: Transferrable lessons from pedagogy," The International Journal of Management Education 14 no. 3, (November 2016): 327-335.

6 Claire Garden, Errol Rivera. „Putting theory into practice: Gamification for student engagement," Paper presented at the EDULEARN18 Proceedings. (July 2018).

These questions deepen our understanding of gamification's social implications and theoretical underpinnings, ensuring a holistic approach to its study and application.

Gamification as a Social Phenomenon

A social phenomenon refers to any observable behaviour, pattern, or event within a society or group of people[7]. These phenomena are often influenced by and can affect social structures, norms, values, and interactions. Social phenomena encompass a wide range of human activities and behaviours, and they can be studied to understand how societies function and evolve. Given that the term "gamification" was recently coined to characterise a social phenomenon emerging with the advent of the digital era, it is essential to evaluate gamification within this context[8]. Social phenomena encompass behaviours that influence or are influenced by organisms responsive to one another, including past generations[9]. They involve the interaction of sentient beings, potentially transcending space and time[10]. From a behavioural perspective, social phenomena can be categorised into three types: social behaviour, aggregated production, and cultural practices[11]. Social behaviour involves contingencies mediated by others' operant behaviour, aggregated production results from multiple individuals' actions, and cultural practices are learned behaviours propagated across individuals.

Information technology has emerged as a significant social phenomenon, fulfilling crucial social functions and enabling novel forms of social organisation[12]. Computer-mediated networks facilitate distributed, interactive communication patterns that align with modern social trends. The interplay between social changes and technological advances is central to the evolution of this domain, highlighting how technology is embedded within human culture and constantly interacts with social structures.

Seven elements should be considered to identify the dignifying side of gamification as a social phenomenon: collective participation, cultural integration,

[7] Floyd H. Allport. "A structuronomic conception of behavior: Individual and collective: I. Structural theory and the master problem of social psychology," The Journal of Abnormal and Social Psychology, 64, no.1. (Jan 1962): 3-30.

[8] Raed Alsawaier. "Research trends in the study of gamification," The International Journal of Information and Learning Technology 36, no. 5. (March 2019): 373-380.

[9]   John F. Markey, "A Redefinition of social phenomena: giving a basis for comparative sociology," American Journal of Sociology 31, no. 6, (May 1926): 733-43.

[10]   John M. Gillete, "Boundary lines of social phenomena," American Journal of Sociology 30, no. 5 (1925): 585-593.

[11] Angelo Augusto, Silva Sampaio, Maria Amalia Pie Abib Andery, "Comportamento social, produção agregada e prática cultural: uma Análise Comportamental de fenômenos sociais," Psicologia: Teoria e Pesquisa 26, no.1. (Mar 2010):183-192.

[12] Daniel Memmi, "Information technology as social phenomenon'" AI & Society, 30 (2015): 207-214.

Society,

social interaction, motivational dynamics, technological mediation, dynamic evolution, and observability/measurability.

Collective Participation

Social phenomena often involve groups rather than isolated individuals. While gamification might appear as an individualistic endeavour, it inherently necessitates collective behaviour and engagement. This communal aspect of gamification is pivotal in fostering cooperation and achieving more effective outcomes among team members. Research has demonstrated that gamification can significantly enhance collective awareness and engagement in various contexts. For instance, gamification could heighten collective awareness regarding water-related sustainability issues[13]. Similarly, some studies illustrate gamification's potential to boost civic engagement, suggesting its utility as a powerful tool for urban designers coordinating interactive and collaborative planning processes[14]. Furthermore, empirical evidence indicates that game features may foster altruism and cooperative goal structures, enhancing the overall effectiveness of team interactions[15]. These findings underscore the capacity of gamification to facilitate cooperative behaviours and improve collective outcomes.

Practitioners leveraging gamification can make informed design decisions to develop cooperative information systems. Through two implementations of gamification, civic learning and engagement were substantially supported. A comprehensive review[16] suggests that while self-determination and motivational affordance theories are prevalent in examining the impacts of cooperative-based gamification, specialised cooperative theories are less common. This gap in the literature highlights an exciting avenue for future research—designing gamification elements that cater to both collectivistic and individualistic cultures, potentially enhancing the global applicability and effectiveness of gamified systems. From an ethical standpoint, introducing gamification features can shift users' primary motivations from intrinsic to extrinsic. This shift might reduce political autonomy, as users' motivation to participate could become more

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[13] Ksenia Koroleva, Jasminko Novak, "How to Engage with Sustainability Issues We Rarely Experience? A Gamification Model for Collective Awareness Platforms in Water-Related Sustainability," *Sustainability* 12, no. 712, (January, 2020): 1-24.

[14] Provides Ng, Yuechun Li, Shutong Zhu, Bingge Xu, Jeroen van Ameijde, "Digital common(s): the role of digital gamification in participatory design for the planning of high-density housing estates," *Frontiers in Virtual Reality* 3, (January 2023):1-23.

[15] Marc Riar, Benedikt Morschheuser, Benedikt Morschheuser, Juho Hamari, Ruediger Zarnekow, "How game features give rise to altruism and collective action? Implications for cultivating cooperation by gamification," Paper presented at the 53rd Hawaii International Conference on System Sciences. (January 2020): 695-704.

[16] Marc Riar, Benedikt Morschheuser, Rüdiger Zarnekow, Juho Hamari, "Gamification of cooperation: A framework, literature review and future research agenda," *International Journal of Information Management* 67, no.102549. (December 2022): 1-24.

about experiencing gamification rather than a genuine desire to contribute to their communities, cautions[17]. This potential diminishing of intrinsic motivation underscores the need for careful consideration in designing and implementing gamification strategies to maintain the authenticity of user engagement and ensure that gamification enhances rather than replaces genuine participation.

The collective aspect of gamification is a rich field of study that offers significant insights into enhancing group dynamics and achieving societal benefits. By understanding and integrating the principles of collective behaviour into gamified systems, practitioners can design more effective, ethical, and inclusive platforms that leverage the motivational dynamics of gamification while respecting and enhancing user autonomy.

Cultural Integration

Gamification is fundamentally a human phenomenon encompassing individual and group behaviours, attitudes, practices, and activities that influence and are influenced by social and augmented realities. At a macro level, gamification seamlessly integrates into cultural norms and practices, reflecting and shaping societal values. This integration embeds game-like elements into everyday activities—from fitness apps to educational tools—illustrating how gamification extends beyond entertainment to influence broader cultural trends and practices significantly. Gamification elements are developed by experts within their respective cultural spheres, who are then engaged with a diverse audience from different cultural backgrounds. This interaction between creation and consumption underscores the deep intertwining of gamification with social elements such as power dynamics, cultural contexts, agency, and networks. These elements collectively shape perceptions, behaviours, and activities within various cultural settings.

Recent studies underscore gamification's potential to elevate cultural literacy and enhance engagement with cultural heritage. For instance, gamification can boost cultural literacy[18]. Similarly, several researches[19] demonstrate its efficacy in promoting cultural sites and museum collections. This indicates gamification's

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[17] Wulf Loh, "The Gamification of Political Participation," *Moral Philosophy and Politic* 6, no. 2, (November, 2019): 1-20.

[18] Renda Yuriananta, Imam Suyitno, Imam Basuki, Imam Basuki, Gatut Susanto, "The Development of Cultural Literacy for Indonesian for Foreign Speakers (BIPA) Students Through RPG Games with a Gamification Approach," *Revista de Gestão Social e Ambiental* 17, no.4. (June 2023): e03472-e03472.

[19] Elisa Bonacini, Sonia Caterina Giaccone. "Gamification and cultural institutions in cultural heritage promotion: a successful example from Italy," *Cultural Trends* 31, no.1 (April 2022): 3-22. Armir Bujari, Matteo Ciman, Ombretta Gaggi, Claudio E. Palazzi. "Using Gamification To Discover Cultural Heritage Locations From Geo-Tagged Photos," *Personal and Ubiquitous Computing* 21, (2017): 235-252.

capacity to serve as an educational tool, making cultural education more interactive and accessible. Further, gamification fosters environments conducive to problem-solving where cognitive and cultural biases can be mitigated through cooperative and competitive reasoning. These gamified environments facilitate the reduction of human judgment biases, suggesting that gamification can be a potent tool for enhancing critical thinking and decision-making skills across cultural boundaries, highlights[20].

Cultural gamification–defined as the gradual integration of ludic elements, dynamics, and conventions into societal frameworks–has been predominantly examined as a Western-centric phenomenon. According to Vincenzo[21]. Cultural factors heavily influence the perception of play and its boundaries in terms of space, time, and context. These perceptions shape how gamification is designed and implemented, indicating the importance of adopting an emic perspective during the design process to tailor gamification strategies to specific cultural contexts effectively.

Social Interaction

Social phenomena fundamentally emerge from interactions between individuals and groups. In this context, gamified systems frequently incorporate features facilitating interaction, competition, and user collaboration. Elements such as leaderboards, team challenges, and social media sharing enhance the user experience, foster connections, and cultivate a community spirit. In the digital age, social phenomena are increasingly mediated by technology, with gamified systems playing a pivotal role in enhancing interactions between individuals and groups. These systems, equipped with features like leaderboards and team challenges, do more than entertain; they forge and fortify community bonds, facilitate learning, and address societal challenges such as social isolation. Such connectedness and interactivity in e-learning environments aim to satisfy learners' social needs as outlined by Maslow, a process referred to as "social e-learning"[22].

A meta-analysis study[23] identifies social interaction as a significant moderator in the relationship between gamification and improved behavioural learning outcomes, highlighting the value of interactive elements in educational contexts.

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[20] Antonio Sanfilippo, Roderick Riensche, Jereme Haack & Scott Butner, "Psychosocial and Cultural Modeling in Human Computation Systems: A Gamification Approach," in Handbook of Human Computation, ed. P. Michelucci, (November 2013): 803-815.

[21] Idone Cassone Vincenzo, "The Japanese Influences on Cultural Gamification," *Replaying Japan*, (June 2020): 49-59.

[22] Lei Shi, Alexandra Cristea, Suncica Hadzidedic, Naida Dervishalidovic, "Contextual Gamification of Social Interaction – Towards Increasing Motivation in Social E-learning," Paper presented at the Advances in Web-Based Learning – ICWL, (August 2014).

[23] Michael Sailer & Lisa Homner, "The Gamification of Learning: a Meta-analysis," *Educational Psychology Review* 32, no.1, (2020): 77-112.

Moreover, the incorporation of gamification strategies to boost social interaction has been explored in various projects, such as a KA 2 project noted[24], which extended beyond social interaction to enhance digital and language skills.

In specific applications targeting vulnerable populations, gamification has been framed as a potential tool to combat social isolation, particularly among the elderly[25]. However, the reliance on digital technologies for such interventions presents inherent challenges. A United Nations report from 2021 reveals that approximately 37% of the world's population, or 2.9 billion people, have never used the internet[26], underscoring the digital divide. This significant statistic highlights the risk that relying exclusively on gamification to prevent social isolation might inadvertently overlook or underestimate the needs of disadvantaged groups. The optimistic framing of gamification as a comprehensive solution to social challenges must be balanced with an awareness of the technological access required to participate fully in these digital interventions. As gamification continues to evolve as a social phenomenon, it is crucial to integrate strategies that are inclusive and accessible to all segments of the population, particularly those who are less technologically adept or economically disadvantaged.

While gamification presents promising opportunities for enhancing social interaction and learning outcomes, it also prompts critical reflection on its accessibility and the ethical implications of its application. By considering these factors, practitioners and researchers can develop more inclusive gamified systems that reduce social isolation and enhance community engagement across diverse populations.

Motivational Dynamics

The motivational dynamics of gamification are rooted in its ability to fulfil intrinsic and extrinsic needs. Social recognition, status, and the pursuit of mastery are inherent motivators that drive user engagement. At the same time, extrinsic rewards such as badges, points, and tangible incentives provide immediate gratification and encourage sustained participation. A study among 184 students defined motivational factors in four dimensions: personal progress, competition and praise, individual assignments, and group work. The study also highlights that

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[24] Natalia Padilla-Zea, Daniel Burgos, Greg Holloway, Joseph Cullen, "Social interaction and gamification with youth at risk of social exclusion: The technological approach of the Keystone project," *Entertainment Computing* 43, no:100502, (August 2022): 1-11.

[25] Juana Isabel Méndez; Pedro Ponce; Alan Meier, Therese Peffer, Omar Mata, Arturo Molina, "Framework for promoting social interaction and physical activity in elderly people using gamification and fuzzy logic strategy," IEEE Global Conference on Signal and Information Processing (GlobalSIP), (2019): 1-5.

[26] "Facts and Figures 2021: 2.9 billion people still offline," ITU NEWS, (2021), accessed from https://www.itu.int/hub/2021/11/facts-and-figures-2021-2-9-billion-people-still-offline/ ,11/06/2024

no single method applies to everyone in terms of motivation in gamification[27]. Despite the different motivators used, Gilyazova& Zamoshchanskii (2020) highlight the importance of intrinsic motivators since entertainment, not being the target, is a tool for learning[28].

Technological Mediation

Gamification as a social phenomenon is deeply intertwined with technological advancements. Digital platforms, mobile apps, and online communities are the primary mediums through which gamified experiences are delivered. These technologies not only facilitate the implementation of gamification but also significantly expand its reach and impact across diverse user groups. Technology is the backbone of gamification, enabling the seamless integration of game elements into various digital environments. This integration allows for real-time data tracking, instant feedback, and the personalisation of user experiences, which are critical for the effectiveness of gamification strategies. Moreover, the widespread adoption of mobile and internet technologies has allowed gamification to permeate everyday activities, enhancing user engagement in areas ranging from education to health and business. However, the benefits of gamification are contingent upon access to technology, digital literacy, and user willingness to engage with these systems.

Integrating technology in gamification also raises considerations regarding digital social capital and technology acceptance. The concept of digital social capital, which plays a crucial role in how individuals benefit from and contribute to online communities, was introduced[29]. Additionally, the Technology Acceptance Model highlighted[30], identifies perceived usefulness and ease of use as key determinants of technology adoption. These factors underscore the importance of technological infrastructure and the psychological and social dimensions of technology use in the success of gamification strategies.

Technological mediation is critical in gamification, both as an enabler and a barrier to success. To maximise the positive outcomes of gamification, it is

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[27] Jared R. Chapman, Peter R. "Identifying motivational styles in educational gamification," Paper presented at the Proceedings of the 50th Hawaii International Conference on System Sciences. (2017):1318- 1327. accessed http://hdl.handle.net/10125/41310,09/02024.

[28] Gilyazova, Olga S., and Ivan I. Zamoshchanskii. "On motivational tools of gamification in higher education: theoretical aspect." (2020): 39-51.

[29] José M. Fortuna, Gabriel de la Fuente, Pilar Velasco. "Does gamification mediate the relationship between digital social capital and student Performance? A survey-based study in Spain," *The International Journal of Management Education* 21, no. 100846, (November 2023): 1-14.

[30] Maruf Gbadebo Salimon, Olayemi Abdullateef Aliyu, Olayemi Abdullateef Aliyu, Maha Mohammed Yusr, "Smartphone banking usage in Nigeria: Gamification, technology acceptance and cultural factors empirical perspectives," *The Electronic Journal of Information Systems In Developing Countries* 87, no.4. (October 2021): 1-19.

essential to address technology accessibility, enhance digital literacy, and foster a positive attitude towards technology use among potential users. Recognising and addressing these challenges will be key in ensuring that gamification can achieve its intended social and individual benefits across all segments of society.

Dynamic Evolution

Social phenomena are inherently dynamic, constantly evolving as societies and cultures develop. As a reflection of these social dynamics, gamification is similarly fluid and responsive to changes in trends, technologies, and user preferences. This continuous adaptability is crucial for maintaining relevance and effectiveness across diverse social contexts. Gamification's evolving nature indicates broader societal shifts, particularly in how people communicate, interact, and engage with each other and technology. As digital landscapes transform, so do the mechanisms and strategies of gamification, ensuring they remain engaging and effective. This evolution is not merely reactive but anticipatory, often leading the way in adopting new technological capabilities and integrating them into user experiences.

Research conducted on businesses employing gamification strategies from 2014 to 2018 reveals insightful trends. According to Raftopoulos[31], 60% of businesses reported a decrease in the benefits received from gamification, with corresponding declines in satisfaction levels. This decline suggests that static gamification strategies may lose their impact over time, necessitating continuous innovation and adaptation to remain effective. To address these challenges, gamification needs to evolve beyond mere engagement tools. Raftopoulos suggests several strategic avenues for this evolution, including capacity building within organisations, promoting more creative and innovative gamification designs, and adopting a strategic approach to business transformation. These measures ensure that gamification adapts to current trends and anticipates and shapes future developments.

Observable and Measurable

Social phenomena can be observed and studied through various methods such as surveys, experiments, and ethnographic research. Gamification allows for collecting data on user behaviours, preferences, and outcomes, providing valuable insights into its impact and effectiveness.

Heuristic Evaluation Criteria from
Social Sciences Perspective

An extensive literature review was conducted to address the research question of how evaluating gamification according to heuristic evaluation criteria can navigate gamification assessment criteria in practice. This review aimed to compare and evaluate the criteria used to assess gamification implementations against

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[31] Marigo Raftopoulos, "Has gamification failed, or failed to evolve? Lessons from the frontline in information systems applications," Paper presented at the GamiFIN Conference, (April 2020): 21-30.

theories in the field of social sciences. Game usability and heuristic evaluation techniques are used to measure the effectiveness of gamification. Game usability "*is the degree to which a player can learn, control, and understand a game*" because it tackles the practical features of a product that are connected to the behavioural goals that the program must meet[32]. Heuristic evaluation is "*using said principles as a usability inspection method by experts to identify usability problems in an existing design as part of an iterative design process*"[33]. Heuristic evaluation assesses usability by using past performance as a guide. A small group of specialists can test an interface using this evaluation method to see if it satisfies a set of standard operational indices. This method's primary characteristic is its ability to approach an issue without adhering to preconceived notions of logic and reason. Instead, conjectures and conversations are produced using verified indices from past events[34]. Either game usability principles or heuristic evaluation techniques posit theories from various academic fields.

Game heuristics can help create the gamification system and guarantee that the system's goals are met. To make a gamification assessment, Jakob Nielsen designed the 10 general principles of the interface. Since they are general rules of thumb rather than precise usability requirements, they are called "heuristics"[35]. When assessing usability heuristics, Jakob Nielsen's 10 Usability Heuristics—first presented in 1990 for Human-Computer Interface (HCI) design—can be regarded as the gold standard. Based on 10 usability heuristics, Sobrino-Duque[39] created a user-centred, self-built tool called Heureka, which takes gamification as a software development process. Three theories—the Self-Determination Theory, the User-Centered Design Theory, and the Psychological Theory of Operant Conditioning—that have been previously used in interactive systems gamification serve as the foundation for Heureka. Self-determination theory and user-centred design formally support the interaction between a person's psychological needs and self-motivation. At the same time, operant conditioning is an associative learning process that involves learning new behaviours based on whether they have positive or negative outcomes. The heuristic evaluation assessment technique highlights a system's usability issues and offers suggestions for fixes. Nielsen[42] contended that expert heuristic evaluation was highly suitable

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[32] Raimel Sobrino-Duque, Noelia Martínez-Rojo, Juan Manuel Carrillo-de-Gea, Juan José López-Jiménez, Joaquín Nicolás, José Luis Fernández-Alemán, "Evaluating a gamification proposal for learning usability heuristics: Heureka.," *International Journal of Human-Computer Studies* 161, no. 102774, (May 2022): 1-15.

[33] Gustavo Fortes Tondello, Dennis L. Kappen, Elise D. Mekler, Marim Ganaba, Lennart Nacke, "Heuristic Evaluation for Gameful Design," Paper presented at the Proceedings of the 2016 Annual Symposium on Computer-Human Interaction in Play Companion, (October 2016).

[34] Chi-Cheng Chang, Tristan Johnson, "Integrating heuristics and think-aloud approach to evaluate the usability of game-based learning material," *Journal of Computers in Education* 8, no. 1 (2020), 137-157.

[35] Nielsen, J. (1994). 10 "Usability Heuristics for User Interface Design". accessed July 29, 2024. https://www.nngroup.com/articles/ten-usability-heuristics/

for the first phase of the usability engineering life cycle. Experts are chosen to conduct these reviews since they usually have more operational experience and professional understanding. During the process, experts consider the viewpoint of inexperienced users to give them access to interactions that regular users might experience. In line with the aim of gamification, the core aims of the heuristic evaluation depend on the context and the target users. The study is noteworthy as it pertains specifically to the educational side of gamification. They created the initial set of playability heuristics designed explicitly for educational games. The five areas of emphasis for this collection of 34 heuristics are educational, multimedia, playability, content, and user interface. Five gamification principles for digital health intervention were empirically confirmed: meaningful purpose, meaningful choice, supporting player archetypes, feedback, and visibility are defined[36]. Different analysis techniques can be used for improving and estimating the effectiveness of heuristic evaluation[37]. Tondello et al. (2016) defined a set of 28 game design heuristics to help specialists assess and find developed design gaps. These heuristics are grounded in game design techniques and earlier theories of motivation. They introduced a comprehensive methodology that covers a wide variety of motivational affordances by deriving a set of heuristics from the common aspects of motivational affordances used by other game design methodologies. Furthermore, their model helps to increase designers' understanding of the various kinds of motivation by classifying the heuristics based on motivational types (intrinsic, extrinsic, and context-dependent motivation). Another study examined game heuristics based on self-determination theory and presented 28 heuristics organised within the 12 dimensions.

In a systematic study on the heuristic evaluation of the usability of educational games[38], confirmed that there are currently few particular verification or validation evaluations in the field of heuristics and usability. Despite some studies discussing the literature on gamification from different perspectives[39], to the best of the

[36] Mark Floryan, I. Philip Chow, M. Stephen Schueller, M. Lee Ritterband. "The model of gamification principles for digital health interventions: evaluation of validity and potential utility". *Journal of medical Internet research* 22, no. 6, (June 2020).

[37] Effie Lai-Chong Law and Ebba Thora Hvannberg, "Analysis of strategies for improving and estimating the effectiveness of heuristic evaluation," Paper presented at the Proceedings of the third Nordic conference on Human-computer interaction, (2004):241-250.

[38] Estela Aparecida Oliveira Vieira, Aleph Campos Da Silveira, Ronei Ximenes Martins, "Heuristic evaluation on usability of educational games: A systematic review," *Informatics in Education* 18, no.2, (2019): 427-442.
Vieira, E. A. O., Silveria, A. C. d., & Martins, R. X. (2019). Heuristic evaluation on usability of educational games: A systematic review. *Informatics in Education* 18(2), 427-442.

[39] Krath, Schürmann, von Korflesch, „Revealing the theoretical basis of gamification…". Perryer, Celestine, Scott-Ladd, Leighton, „Enhancing workplace motivation through gamification…". Abhishek Behl, Nirma Jayawardena, Vijay Pereira, Nazrul Islam, Manlio Del Giudice, Jyoti Choudrie. "Gamification and e-learning for young learners: A systematic literature review, bibliometric analysis, and future research agenda." *Technological Forecasting and Social Change*, 176,

authors' knowledge, no study has discussed gamification assessment criteria in practice as a social phenomenon. At the same time, this article is grounded on the predetermined gamification criteria that are created for an Erasmus+ KA2 project. HERITAGE GAME - A gamification model for community-based heritage work In this study, the evaluation criteria were developed by Smokova et al. (2024)[40]. The criteria were developed through extensive literature review by the coordinator of the project [41]and developed by online meetings among the partners. Thus, academicians from various fields, such as computer science, social science, and economics, contributed to the process, enabling a multidisciplinary approach.

The project consists of seven countries and the project partners rate the existing gamification examples that focus on cultural heritage in each country according to predetermined criteria. This article is based on the heuristic evaluation criteria for assessing five gamifications that reflect Türkiye's cultural heritage.

The existing gamification assessment criteria do not fully capture the spectrum of motivational affordances typically utilised in the game design, criticized[45]. The key motivational elements, such as meaning, rewards, and scarcity, are often employed in game design but are not adequately addressed by current game design heuristics. This gap makes evaluating game-like applications using traditional game design heuristics challenging. Evaluators must selectively apply heuristics and consider motivational factors that current heuristics overlook. Several theoretical frameworks have been pivotal in understanding how gamification influences motivation, behaviour, and learning outcomes. For example, self-determination Theory and the Theory of Gamified Learning provide insights into the motivational dynamics behind gamification[42]. Krath et al. (2021) have identified over a hundred theories related to gamification, serious games, and game-based learning, many of which share core principles. These principles underscore that effective gamification can articulate clear goals, provide immediate feedback, reinforce desired behaviours, and simplify complex tasks. Furthermore, it can facilitate personalised progression paths and enable user social comparison.

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[40] Smokova, M., Marques, C. G., Simões, J. P., Mateus, L., Miloiu, S., Musteață, S., & Parashkevova, E. (2024). A guide to identifying best practices for gamification in cultural heritage. PH Tsenov: Svishtov, 53. Retrieved on 19.08.2024 from https://dlib.uni-svishtov.bg/handle/10610/5035, 10/10/2024

[41] Marques, C. G., Pedro, J. P., & Araújo, I. (2023). A systematic literature review of gamification in/for cultural heritage: Leveling up, going beyond. Heritage, 6(8), 5935-5951.

[42] Gillete. „Boundary lines of social phenomena …". Amarillys R. Félix da Silva, Alanda Maria Ferro Pereira, Sheyla Christine Santos Fernandes, Nycolas Emanuel Tavares de Lira, Ig Ibert Bittencourt, "El Uso de la Teoría de la Autodeterminación en el Contexto de la Gamificación. Una revisión de la literatura," *Revista Latinoamericana de Tecnología Educativa – RELATEC* 21, no.2, (July, 2022): 59-82.

Gamification Practices

In this study, gamification is assessed as a social phenomenon, and gamification assessment criteria in practice, applied for five gamification implementations that reflect Türkiye's cultural heritage, were evaluated from a social sciences theories perspective. Assessments were made with 12 criteria from three different heuristic perspectives: intrinsic motivation heuristics, extrinsic motivation heuristics, and context-dependent heuristics. The inference on each criterion, related theory, and explanation are presented in Table 1. The requirements were assigned in two steps. In the first step, the criteria and their definitions, the articles and the handbook of the project are introduced to Chat-GPT4 and asked to assign each criterion to an appropriate theory. In the second step, the two academics from social sciences controlled the assignments. After assuring the requirements are set on the right related theory, the table was developed based on the consensus of two academics. Thus, the assignment of each criterion under the related theory is subjective.

Table 1. Assessment Criteria and Related Theory

Heuristics	Assessment criteria	Theory	Explanation
Intrinsic Motivation Heuristics	Purpose and Meaning	Self-Determination Theory (SDT)	Helps users find meaningful goals (I1, I2)
	Challenge and Competence	SDT, Goal-Setting Theory	Fosters competence through increasing challenges (I3, I4, I5)
	Completeness and Mastery	SDT	Supports achievement and task completion (I6, I7)
	Autonomy and Creativity	SDT	Encourages user choice and self-expression (I8, I9, I10)
	Relatedness	SDT	Promotes social interaction and cooperation (I11, I12, I13, I14)
	Immersion	Experiential Learning	Enhances engagement through narrative (I15, I16)
Extrinsic Motivation Heuristics	Ownership and Rewards	Expectancy Theory	Motivates through ownership and reward systems (E1, E2, E3)
	Scarcity	Expectancy Theory	Creates exclusivity and urgency (E4)
	Loss Avoidance	Expectancy Theory	Encourages action to avoid losses (E5)
Context-Dependent Heuristics	Feedback	Goal-Setting Theory, Behaviourism	Provides clear progress indicators (C1, C2, C3)
	Unpredictability	Intrinsic/Extrinsic Motivation	Keeps users engaged through variability (C4, C5)
	Change and Disruption	Constructivist Learning Theory	Encourages innovation and system improvement (C6, C7)

Gamification Implementations

This section presents the application and testing of criteria based on cultural heritage through 5 gamification implementations. Two experts selected and evaluated these studies to assess reliability. Information about the content of these studies is shown in Table 1.

Table 2. Overview of Cultural Heritage Projects and Their Classifications

Project name	Cultural Heritage Involved	Typology	Geographical Relevance
P1. The Anatolian Journey Along the Silk Road[43]	Historical Exploration of the Silk Road in Anatolia	Intangible	Regional
P2. Antalya Alarhan[44]	Local history of Antalya Alarhan	Intangible	Local
P3. The Sericum Via A Serious[45] Game For Heritage Of Iran	Historical Exploration of the Silk Road in Iran	Intangible	National
P4. Timeline Travel[46]	Time travels in architectural history	Tangible	International
P5. Valorium[47]	Art historian simulator	Tangible	International

The Anatolian Journey Along the Silk Road[50] aims to evaluate the learning pace through the game Anatolian Journey, which is based on the cultural heritage of Anatolia. This study used a game developed on the Twine platform to help students convey the tangible and intangible cultural heritage of caravanserais from the Seljuk period in Anatolia. The game allows players, who assume the role of a merchant travelling along trade routes, to acquire historical knowledge by stopping at caravanserais. The study compares the effectiveness of learning through the game with traditional text-based learning methods.

Antalya Alarhan[51] addresses designing, implementing, and testing a GIS-based educational game to preserve digital cultural heritage through a 360° virtual tour experience of caravanserais in Anatolia. With the increased importance of remote learning methods during the pandemic, the study investigates integrating virtual and augmented reality applications into education using low-cost, user-friendly content. The study focuses mainly on the Alarhan caravanserai in Antalya, presenting these historic structures as a virtual tour with 360° images and enabling users to learn historical information by solving puzzles within the game.

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[43] "The Anatolian Journey" accessed from May, 2024, https://vaezafshar.com/Games/ipk5.html

[44] "Antalya Alarhan" accessed from May 2024, https://vaezafshar.com/Games/khan_game/

[45] "The Sericum Via A Serious Game For Heritage Of Iran" accessed from May, 2024, https://vaezafshar.com/Games/Sericum_Via.html

[46] "Timeline Travel" from May, 2024, https://play.google.com/store/apps/details?id=com.time-linetravel

[47] "Valorium" accessed from May, 2024, https://alperenerll.itch.io/valorium

The Sericum Via A Serious Game For Heritage Of Iran[52] focuses on the design and testing of a game which aims to preserve and disseminate Iran's and Türkiye's cultural heritage. The game takes players on a journey to Safavid-era caravanserais along the Silk Road in Iran, allowing them to learn about tangible and intangible cultural heritage. The game aims to present Iran's rich history and cultural heritage in an educational and entertaining format that captures players' interest. The Sericum Via, a text-based and strategic game, requires players to use their decision-making skills and solve puzzles based on historical knowledge.

Timeline Travel[53] is an application developed as part of an EU project. It visualises everything that changes over time for users, focusing on architectural history. This application offers an alternative tool for learning architectural history using a timeline and a map. Users can see the structures of a historical city on the timeline and map. With Timeline Travel, users can organise and visualise data such as visited places, significant life events, books, films, and photographs and easily create their timelines.

Valorium[54] is a 3D interactive art historian simulator developed for the Cultural Heritage Game Jam. In it, users can physically interact with tools to distinguish original cultural artefacts from imitations. Created by the Sparks team, this application gamifies architectural and cultural heritage education, enabling users to analyse historical artefacts and identify authentic pieces.

Best Practices

Two experts have rated the gamifications to identify the best practices according to the defined assessment criteria out of 5 points. Ratings for each expert (noted as R1 and R2) for each gamification and criteria are given in Table 3. The table lists criteria in Tables 1, 1, 2 and 3, representing intrinsic motivation, extrinsic motivation and context-dependent heuristics, respectively. Based on the information, the best practices include Antalya Alarhan and The Sericum Via A Serious Game For Heritage Of Iran.

According to the rates in the table, the top two results are Antalya Alarhan (P2-score 4.79) and The Sericum Via A Serious Game For Heritage (P3 - score 4.46). P2 has demonstrated outstanding performance by achieving maximum points in almost all criteria, particularly excelling in intrinsic and extrinsic motivation criteria. When analysed according to gamification criteria, the game achieved maximum points in all sub-criteria except for Change and Disruption, which received 1.5 and 3 points, respectively. Similarly, P3 has also received high scores, showing strong performance, especially regarding intrinsic motivation criteria. P2 is a game dedicated to Antalya Alarhan. It explores local history, focusing on intangible heritage, and is designed for educational and recreational use. Available on mobile devices with web access, it includes interactive elements such as sound effects, illustrations, storytelling, and hidden clues within the narrative to enhance the educational experience. These gamification projects are deemed the most successful according to the specified criteria.

Similarly, P3 focuses on the intangible heritage of the Silk Road, providing an immersive educational experience. As part of UNESCO's Silk Road Program, this segment of the Silk Road traverses the western and southern edges of Iran's central desert, connecting historic cities like Kashan, Nain, Yazd, and Kerman, and extends to India. This game, accessible on mobile devices with web access, is designed to educate and entertain, offering a captivating method to learn about this historic trade route.

Table 3. Ratings and Averages of Gamification by Criteria According to Raters

Criteria \ Raters	P1		P2		P3		P4		P5	
	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2
1a	5	5	5	5	5	5	5	5	4	4
1b	5	5	5	5	5	5	1	1	4	3
1c	5	5	5	5	5	5	1	1	1	1
1d	4	4	5	5	3	4	2	2	2	2
1e	5	5	5	5	5	5	2	1	3	3
1f	5	5	5	5	5	5	3	3	4	4
2a	5	5	5	5	5	5	1	1	4	4
2b	3	5	5	5	4	5	1	1	5	5
3c	4	3	5	4	4	4	1	1	4	4
3a	5	5	5	5	4	4	4	3	2	2
3b	5	5	5	5	5	5	1	1	5	5
3c	1	2	3	3	2	3	2	2	1	1
Average	4.33	4.50	4.83	4.75	4.33	4.58	2.00	1.83	3.25	3.17
Total	4.42		**4.79**		**4.46**		1.92		3.21	

Conclusion

Gamification design should adhere to an iterative, user-centred design process involving much user input and early idea testing. Information systems must be designed with gamification, incorporating the best technological features and the complex and multifaceted aspects of user psychology and engagement[48].

In this study, gamification is assessed as a social phenomenon. Seven characteristics during game design and improvement should be considered: collective participation, cultural integration, social interaction, motivational dynamics, technological mediation, dynamic evolution, and observability/measurability. These elements have the potential to assess the gamification for a quick map. For example, computer communication is considered a risk for natural human needs, such as socialisation, unless collective participation is regarded as a core design element. As the supplementary element of communication, cultural

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[48] Juho Hamari and Jonna Koivisto, "Working out for likes": An empirical study on social influence in exercise gamification," *Computers in Human Behavior* 50, (April 2015): 333-347.

integration and social interaction should be paid attention to basic human needs such as socialisation. A gamification with the most successful design elements will fail unless it considers basic human needs. Gamification involves teaching human beings, and human beings are part of its definition.

Considering that the heuristic of gamification depends on context and purpose, this study analysed the game heuristic criteria applied for a KA2 project. The project aimed to promote social and civic engagement and democratic participation in the field of cultural heritage in low-density areas. The heuristic criteria chosen for this purpose were analysed from a social science theory perspective. In this context, seven theories were highlighted: self-determination, experiential learning, goal setting, learning, expectancy, behaviourism, intrinsic/extrinsic motivation, and constructivist learning theory. This finding draws attention to the rich theoretical background in the field, as gamification evaluation criteria are selected according to purpose and context.

Five gamification implementations are introduced to clarify where heuristic evaluation criteria are enforced. Among the gamification examples, "Antalya Alarhan" got the highest score compared to "The Anatolian Journey Along the Silk Road" and "The Sericum Via A Serious."[49], "Timeline Travel," and Valorium. This study details the assessment process to enlighten future studies.

This study aimed to holistically contribute to the gamification literature, incorporating academics from information systems and management science fields. The key concepts of gamification as a social phenomenon have the potential to add new insights during the design phase of gamification. Specifically, the study underscores the importance of considering gamification within the broader social and technological landscapes where users operate, ensuring that gamification systems are relevant, effective, and culturally competent. Additionally, by linking gamification assessment criteria to social science theories, this study may have the potential to navigate researchers from social sciences to evaluate gamification with a theoretical perspective in mind.

Future research should explore the long-term effects of gamification on user behaviour and social systems, particularly in diverse cultural settings. Further investigation into the balance between intrinsic and extrinsic motivational strategies in gamification could provide deeper insights into optimising user engagement and satisfaction. In conclusion, this study deepens our understanding of gamification as a social phenomenon. It sets the stage for future explorations into its complex interactions with user psychology, technology, and societal change. By continuing to explore these dynamics, researchers and practitioners can enhance the strategic deployment of gamification to meet the evolving needs of users around the globe.

Rezumat

Adoptarea pe scară largă a jocurilor în diferite domenii necesită metodologii robuste pentru a evalua impactul și eficacitatea acestora. Acest studiu

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[49] "The Sericum Via A Serious Game For Heritage Of Iran" accessed from May 2024, https://vaezafshar.com/Games/Sericum_Via.html

explorează tehnicile de evaluare euristică utilizate într-un proiect al Uniunii Europene în care partenerii au evaluat aplicațiile de jocuri axate pe patrimoniul cultural în țările lor respective. Recunoscând jocurile ca un fenomen social, această cercetare evaluează opt dimensiuni cheie: participarea colectivă, integrarea culturală, interacțiunea socială, dinamica motivațională, medierea tehnologică, evoluția dinamică și observabilitatea/ măsurabilitatea. Criteriile de evaluare, categorisite în euristici motivaționale intrinseci, extrinseci și dependente de context, sunt analizate prin prisma teoriilor sociale proeminente, inclusiv Teoria Autodeterminării, Teoria Așteptărilor și Teoria Stabilirii Obiectivelor, alături de paradigmele de învățare, cum ar fi Învățarea Constructivistă și Experiențială. Rezultatele evidențiază modurile nuanțate în care jocurile influențează implicarea utilizatorilor și învățarea, oferind implicații semnificative pentru proiectarea unor strategii de jocuri mai eficiente. Această analiză cuprinzătoare subliniază potențialul de a integra teorii sociale robuste pentru a îmbunătăți înțelegerea teoretică și practică a rolului jocurilor în contextul societal modern.

Cuvinte cheie: Patrimoniu Cultural, Gamificare, Evaluare Euristică, Teorii Motivaționale

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