

A Systematic Literature Review of Critical Success Factors for User Experience in Gamification of Work

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Abstract. Gamification has gained popularity across various fields as a means to enhance user motivation and performance. In recent years, the focus has shifted to gamifying work environments to increase employee productivity and motivation. The integration of game design elements in the workplace aims to create a more engaging, enjoyable, and meaningful experience for employees. However, the effectiveness of gamification in improving user experience relies on careful design and implementation. This paper presents a systematic literature review using VOS Viewer that aims to identify and evaluate critical success factors associated with user experience in the gamification of work. The review encompasses both quantitative and qualitative research to identify and assess the most significant factors for successful gamification implementation in work contexts. The anticipated outcomes of this review will provide valuable insights into best practices for achieving successful gamification in the workplace. These insights will be useful for researchers, practitioners, and organizations seeking to enhance user experience and achieve success in the gamification of work. By synthesizing existing literature, this study contributes to the understanding of how to design and implement gamification strategies effectively. It highlights the importance of user experience in gamified work environments and provides guidance on factors crucial for achieving positive outcomes. From a practical standpoint, this study serves as a blueprint for organizations seeking to incorporate successful gamification strategies in their processes. From a theoretical perspective, this study contributes to the existing body of knowledge on gamification specifically in the context of work, providing an in-depth analysis of the critical success factors. The findings will benefit researchers by identifying research gaps and future directions, practitioners by offering practical insights for designing and implementing gamification initiatives, and organizations by assisting in improving user experience and maximizing the potential benefits of gamification in the workplace.

Keywords: Gamification of Work, User Experience, Critical Success Factors, Systematic Literature Review, VOS Viewer

1. Introduction

Gamification has emerged as a popular strategy for enhancing user motivation and engagement in various fields, including education, healthcare, and marketing (Mora et al., 2015). Gamification refers to the application of game design elements and principles in non-game contexts, aiming to enhance user engagement, motivation, and behavior. Over the past decade, this strategy has seen widespread adoption in various domains. Recently, the corporate world has recognized its potential, integrating gamification into work environments. Within this context, gamification is employed to increase productivity, teamwork, and employee satisfaction (Hamari et al., 2014). By incorporating mechanisms like leaderboards, badges, and points, businesses aim to make tasks more engaging, promote healthy competition, reward accomplishments, and ultimately, create a more dynamic and motivating workplace. Gamification can provide a solution to various problem indicators, as game elements can increase work motivation and engagement (Seaborn & Fels, 2015), improve learning processes and skill development, facilitate cooperation and communication among employees (Sailer et al, 2017), enhance productivity and work efficiency through healthy competition (Alcivar & Abad, 2016), and strengthen employee retention and loyalty by providing opportunities for growth (Morschheuser et al., 2016). By leveraging these principles of gamification, companies can create a more effective, competitive, and safe working environment for workers in general.

While gamification has been shown to positively impact on user experience, its effectiveness depends on how well it is designed and implemented (Koivisto & Hamari, 2019). Although numerous studies have explored the influence of gamification on user motivation and performance, there remains a gap in understanding the factors that contribute to the successful implementation of gamification in the workplace context. Previous studies have investigated the study on a failed gamification project, a lack of consideration for user experience can lead to critical failure factors, such as confusing game mechanics and lack of clear goals (Alsharo et al., 2017). The authors recommend that organizations pay attention to the user experience in gamification design and implementation to ensure a successful project. Similar findings were reported by another researcher, who conducted a survey on gamification and found that user experience was a key factor in determining the success of a gamification project (Mora et al., 2015). They suggest that gamification designers should focus on creating enjoyable, engaging, and meaningful experiences for users. Additionally, it was found that the design of gamification elements should align with the needs and preferences of the users, and that feedback and rewards should be provided in a timely and clear manner (Koivisto & Hamari, 2019).

From these cases, research on the critical factors affecting the success of improving user experience in gamification of work is still insufficient. Despite the evidence highlighting the potential benefits of gamification in the workplace, a clear understanding of the specific factors that ensure its success is missing in the current literature. This is especially crucial as a misalignment in design and user needs can lead to failed projects. Recognizing this gap, our study aims to determine the critical success factors that influence user experience in the implementation of gamification strategies within the workplace context. This research will contribute to a better understanding of the interaction between gamification and user experience, providing valuable insights for practitioners and researchers designing and implementing effective gamification strategies in the workplace.

Furthermore, this study will present a comprehensive model incorporating these critical factors, which can serve as a guide for practitioners and researchers in designing and implementing effective gamification strategies in the workplace. By examining the critical success factors of gamification in the workplace, this research aims to make a novel contribution to the body of knowledge in the field of gamification and user experience within the workplace context.

2. Literature Review

2.1. Gamification of Work

Gamification of work essentially involves the use of game-design principles and elements in work

environments. The primary objective is to boost user participation, motivation, and engagement by integrating the fun and interactive elements commonly found in games into work processes. (Riatmaja et al., 2020). The process includes a group of game mechanics, such as leaderboards, points, badges, and challenges, that aim to stimulate intrinsic motivation in users and guide their behaviour towards predetermined objectives. Effective implementation of gamification can increase engaging, meaningful, and interactive experiences that enhance several aspects of work performance, including collaboration among employees, job satisfaction, and productivity.

The concept of gamification in the workplace has gained considerable attention in recent years, as organizations explore innovative ways to motivate and engage employees. Koivisto & Hamari (2019) indicate that, although gamification can enhance motivation and engagement, its success is heavily dependent on the context and the design of the gamified system. This highlights the importance of aligning the gamified elements with the desired outcomes and the characteristics of the users.

2.2. Gamification and User Experience (UX)

User experience encompasses how end-users interact and feel about applications or services, including websites, software, mobile applications, or digital platforms (Jagust et al, 2018). Thakur and Han (2018) emphasize that user experience has a personal aspect as it deals with the individual's experience and viewpoints. Users will continue using an app or service if they are satisfied with the user experience and engagement. The primary goal of gamification in the workplace is to boost employee engagement and motivation, potentially leading to increased productivity, collaboration, initiative, and job satisfaction.

In gamification of work, if the user does not recognize the application or service as dynamic, challenging, satisfying, or enjoyable, this could negatively affect the user experience. Consequently, a negative user experience may be detrimental to motivation, participation, and continued usage intentions. Similarly, previous studies attest that technology significantly influences users' behaviour and their experiences. Thus, it becomes critical to address usability issues throughout the game interface, mechanics, and gameplay (Alkawsu et al, 2021). In brief, a successful gamification design enables users to connect with the interface and might encourage them to continue engaging with the system.

2.3. Bibliometrics

Bibliometrics, a subfield of information science, is commonly used in library field to analyze details like publication year, citations, and visual content within articles (Rahayu & Tupan, 2018). Bibliometrics is widely used to study the interaction between science and technology, investigate the development of new knowledge in a particular field, and produce a mapping of science (Tupan et al, 2018). The mapping in question is a map visualization containing topics from science that can help researchers develop their research programs. This visualization can be created using VOS Viewer.

2.4. VOS Viewer

VOS Viewer is a computer program developed to create bibliometric maps. In summary, VOS Viewer functions to create, visualize, and explore maps based on various networks that show relationships in citing a publication. Bibliometric mapping with VOS Viewer usually uses various database sources such as Scopus, Google Scholar, Crossref, Web of Science, and Microsoft Academic Search (Alfitman, 2019). This study uses Scopus as a database due to its reputation and that Scopus is the largest database of international scientific publications (Purnomo et al, 2020). The result of bibliometric analysis using VOS Viewer provides comprehensive view of the research subject and helps researchers and practitioners gain a thorough grasp of the current state and developments in that subject (Luo & Hussain, 2023).

3. Methodology

The method that is used in this research is a Systematic Literature Review. The Systematic Literature

Review (SLR) methodology is a structured and comprehensive approach to reviewing and synthesizing research evidence in a specific field, ensuring transparency, reproducibility, and minimization of bias (Petersen et al., 2015). This research method is the combination of SLR and bibliometric analysis whose steps were adapted from research conducted by Tupan et al (2016). Bibliometric studies are the most frequently used method to analyze the publication patterns of certain database, such as Scopus, ScienceDirect, Ebsco ProQuest, Springer, etc (Saputra A., 2018).

First, we executed the SLR by inputting “gamification of work user experience” as the keyword in the Scopus database and later on extracted the sample set of research papers using the exclusion and inclusion criteria. The current SLR was also enhanced by conducting an in-depth analysis of individual studies, as this approach delves into the comprehensive content of a research article. Our primary research articles for this study were sourced from the Scopus database. Recognized as a vast database for abstracts and citations of articles, Scopus features contributions from top publishers. According to Almeida (2018), using keyword searches is an effective method to identify relevant articles for a specific study. In our case, we employed a combined keyword search within the Scopus—Title, abstract, and keyword sections to generate the most relevant study in our research area. Afterward, the data is saved in the form of csv. Microsoft Excel was used to analyze the number of publications, and the topmost cited articles.

The second phase, we conducted a descriptive analysis and bibliometric analysis of the literature on gamification of work user experience to help understand the foundational structure of the research field. Previous research studies used variety of software to carry out bibliometric analysis. For our research, we use VOS Viewer because of its ability to display larger bibliometric maps in an easy-to-interpret way which was not possible with the previous bibliometric software. Additionally, VOS Viewer provides enhanced features like zooming, scrolling, and search functionalities, greatly assisting in a thorough exploration of a map. The scope of the study encompasses a comprehensive review of empirical studies published in journals from 2013 to 2023 using the Scopus database, excluding gamification research focused augmented reality, dan virtual reality. Figure 1. represents the design of the research.

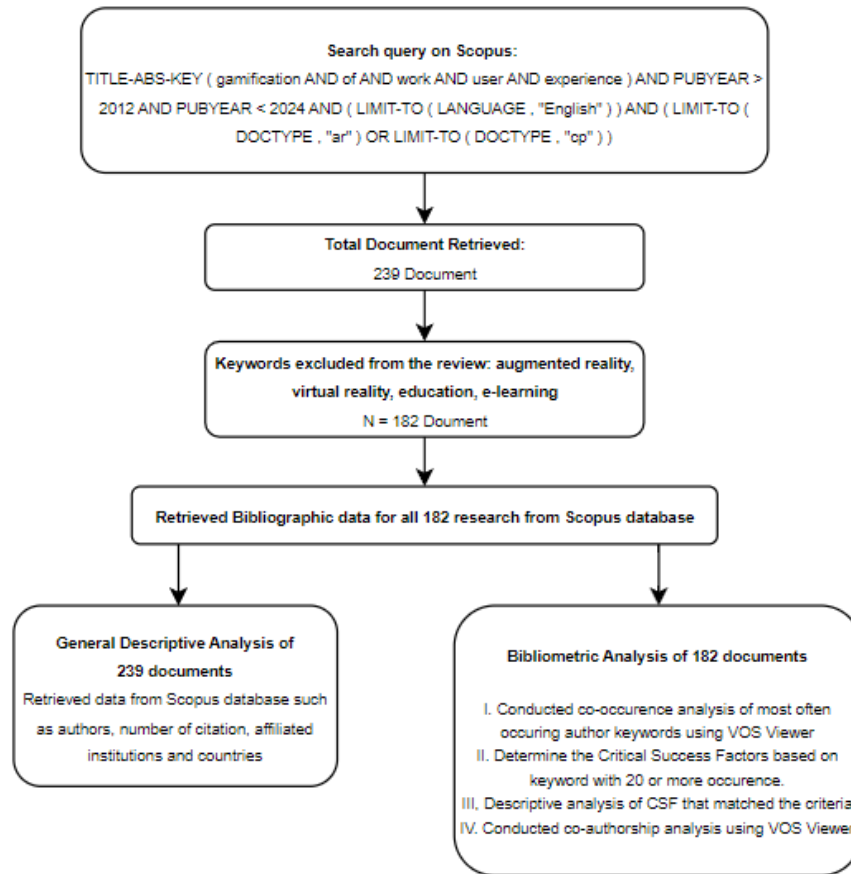


Fig. 1: Research Design

A total of 182 records are included in this review. In selecting the documents for the purpose of review, we included only document available in English language with published year between 2013 and 2023. We included the document published as article and conference paper. We further excluded the articles that were not available as full text article and outside the scope of the present study. Table 1 provides a synoptic overview of the selection criteria undertaken by researcher for selection of relevant studies.

Table 1: Inclusion and Exclusion Criteria

Criteria	Description
Inclusion	Publication Year from 2013 to 2023
	English Language
	Document type article
	Document type conference paper
Exclusion	Keywords Augmented Reality
	Keywords Virtual Reality
	Documents outside the scope of gamification of work

4. Results and Discussion

4.1. General Descriptive Statistics

This section gives a clear overview of the Gamification of Work User Experience Research. It uses data to show important trends and main points related to the topic. Microsoft Excel was used to analyze the

number of publications and the topmost cited articles.

4.1.1. General Descriptive Statistics

In this study, the focus is on journal articles and conference paper published between 2013 and 2023, which concentrate on the subject of user experience in gamification of work. When observing the publication date of the records (Figure 2), it can be observed that the year with the highest scientific production on the research topic was 2020.

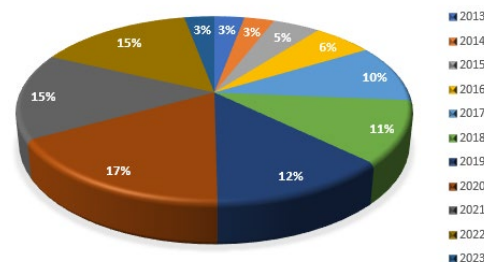


Fig. 2: Publication dates from filtered records

Utilizing the Scopus search engine, 182 journal articles and conference paper were identified that met the criteria for user experience in gamification of work within the field of computer science. Research on gamification of work cannot be separated from other variables that influence or support the concept of gamification itself.

4.1.2. Most Influential Works in Gamification of Work User Experience Research

Identifying the highly cited research articles provided a new avenues to the field of research. Total citations per year compare the influence of the article irrespective of the year in which it was published. To locate the most the most influential research published in the field of gamification of work, we set the cut-off limit to 40 citations. Table 2 represents the list of highly cited papers on gamification of work user experience. The phenomenon of Matthew effect, where researchers often cite articles that have already received many citations, viewing them as more reliable sources of information.

Analysis of the highly cited papers highlight the fact that Seaborn & Fels (2015) significantly contributed towards gamification of work user experience research with this seminal work. His contribution laid the foundation for empirical research works in the field of gamification of work user experience research. Following his research, other scholars delved into the topic using well-known theoretical models. Some even expanded on these existing frameworks, introducing and validating new concepts they believed were overlooked in earlier studies. (Hamari J. & Koivisto J. 2014; Tsay C.H. et al 2018; Kumar, J. 2013; Tondello et al., 2017; Mora A., et al. 2015). The following set of highly cited articles includes contributions from Högberg J., Hamari J., & Wästlund E. (2019), Giunti G., Mylonopoulou V., & Romero O.R. (2018), LeGrand S. et al. (2018), and Bowser A. et al. (2014). Their research delved into the behavioral patterns of adoption in various instances of application development utilizing gamification. The insights from these studies shed light on how gamification influences user behaviors across different application contexts. The gamification characteristics proposed are largely used across different studies on user experience in conjunction with established theoretical frameworks. Highly cited research works contributes to the development of theory and methodology, gaining recognition across various disciplines.

Table 2: Highly Cited Research Paper on Gamification of Work User Experience

No	Authors	Title	Source Title	Cited by	C/Y
1	Seaborn K. & Fels D.I. (2015)	Gamification in theory and action: A survey	International Journal of Human Computer Studies	1318	164.8
2	Hamari J. & Koivisto J. (2014)	Measuring flow in gamification: Dispositional Flow Scale-2	Computers in Human Behavior	181	20.1
3	Tsay C.H. et al (2018)	Enhancing student learning experience with technology-mediated gamification: An empirical study	Computers and Education	132	26.4
4	Kumar J. (2013)	Gamification at work: Designing engaging business software	Lecture Notes in Computer Science	124	12.4
5	Högberg J., Hamari J., & Wästlund E. (2019)	Gameful Experience Questionnaire (GAMEFULQUEST): an instrument for measuring the perceived gamefulness of system use	User Modeling and User-Adapted Interaction	111	27.8
6	Tondello et al. (2017)	Elements of gameful design emerging from user preferences	Proceedings of the Annual Symposium on Computer-Human Interaction in Play	109	18.2
7	Mora A., et al. (2018)	Effect of personalized gameful design on student engagement	IEEE Global Engineering Education Conference, EDUCON	47	9.4
8	Giunti G., Mylonopoulou V., & Romero O.R. (2018)	More stamina, a gamified mHealth solution for persons with multiple sclerosis: Research through design	JMIR mHealth and uHealth	45	9.0
9	LeGrand S. et al. (2018)	Testing the Efficacy of a Social Networking Gamification App to Improve Pre-Exposure Prophylaxis Adherence (P3: Prepared, Protected, emPowered): Protocol for a Randomized Controlled Trial	JMIR Research Protocols	40	8.0
10	Bowser A. et al. (2014)	Gamifying citizen science: A study of two user groups	Proceedings of the ACM Conference on CSCW	40	4.4

network analysis within the scope of gamification of work are game elements, students, human-computer interaction, e-learning, motivation, user engagement, usability, surveys, and computer aided instruction. These factors emerged as significantly recurring and interconnected themes across the corpus of analyzed literature, indicating their substantial impact on user experience in the context of work-related gamification. The frequency of these themes signifies their prevalent discussion and acknowledgment among researchers, suggesting their role as integral components in successful gamification strategies. Moreover, the co-occurrence of these keywords demonstrates their interrelated nature, further reinforcing their selection as critical success factors. Each of these chosen factors presents a unique facet of gamification, collectively providing a comprehensive overview of the elements vital for enhancing user experience in the gamification of work.

4.2.2. Keyword Co-Occurrence Network Analysis

Successful gamification is built on several key factors. In Table 3, we list these important factors and group them into three main categories: Technology, Human, and Procedure. Following this, a detailed description of each factor is provided, using studies and research to highlight their role in making gamification effective.

Table 3: Category of Critical Success Factors in Gamification of Work User Experience

Category	Critical Success Factor	Description
Technology	Game Element, Human-Computer Interaction, Usability	Elements related to the technological infrastructure necessary for implementing gamification. These factors related to the design and functionality of the technological platform which greatly influence the success of the gamification process.
Human	Motivation, User Engagement	Aspects associated with the individual users interacting with the gamified system. These factors related to the emotional and cognitive responses of the users towards the gamified system and their overall involvement in the gamification process.
Procedure	Computer-Aided Instruction	Systematic processes or methods employed in the gamified system to facilitate learning or the completion of tasks. This factor focuses on the instructional strategies employed in the gamified system to improve the learning experience.

The first critical success factor is Game Element. Game elements, specifically the mechanics and dynamics of play, are the key characteristics of gamification. Game mechanics refer to the actors, objects, and relationships that define the rules of a rule-based game system. They dictate what exists in the game, how everything behaves, and how players can interact with the game world (Urh et al., 2015). A qualitative case study emphasizes the importance of appropriately implemented gamification elements, the findings suggest users perceive promotional gamification schemes positively, thereby enhancing their interaction with the platform. This implies that successful incorporation of gamification elements can elevate the quality of user experience (Mogavi et al., 2022).

Regarding Human-Computer Interaction (HCI), a pivotal critical success factor in gamification, the work of Martens M., Rinnert G.C., and Andersen C. (2018) sheds light on its significance. They emphasize the essence of designing systems centered around the end-user. This approach not only ensures user accessibility and friendliness but also guarantees a seamless interaction between the user and the digital environment. In the context of gamification of work user experience, their findings suggest the importance of a user-centric design. Ensuring that the gamified system is intuitive and

tailored to the user's needs can significantly enhance their experience. By focusing on human-computer interaction, gamified systems can be more engaging, interactive, and beneficial to the user, reinforcing its role as a critical success factor in gamification.

Motivation is the driving force behind any action. In the realm of gamification, motivation translates to the push users need to engage with a system. A study led by Ibrahim et al. (2021) investigated the design elements used in gamified mental health support apps. The results illuminated the profound impact of achievements and rewards on users. The game elements which can be used to design effective gamification strategies to increase motivation are grouped into three categories: feedback, rewards, and goals (Yahaya et al, 2022). In the context of gamified work experiences, such motivational aspects can significantly enhance participation, persistence, and overall satisfaction, proving that gamification isn't just about playing, it's about purposefully engaging with clear goals in mind.

Engagement is the measure of how captivating an experience is. When applied to gamification, it answers how compelling a gamified system is to its users. Panyawanich et al. (2022) studied the Octalysis Gamification framework's application in creating electronic wallet experiences. Their findings demonstrated that a meticulously designed gamified system captivates users, holding their attention and increasing their interaction time. This is crucial for the workplace, where increased engagement can lead to improved efficiency, greater knowledge retention, and a more enjoyable user experience.

At its core, usability is about user-friendliness. A gamified system might have all the bells and whistles, but if it's difficult to navigate or understand, it defeats its purpose. Rincon-Flores (2022) research on the development of Gamit, a platform for gamification, showed just that. Usability was directly proportional to user engagement. In the workplace, this translates to reduced training times, fewer user errors, and a smoother introduction of gamified systems. A system that's intuitive and easy to use naturally encourages users to interact with it more, maximizing the benefits of gamification.

The last critical success factor is the computer-aided instructions. Guidance, in any new system or process, can be the difference between its acceptance or rejection. In the world of gamification, computer-aided instruction plays that pivotal role. The research by Van-Roy et al. (2019) found that using tutorials in online learning environments not only provided acknowledgment but also guided users on their journey, creating milestones and checkpoints. In a gamified work environment, such markers help users understand their progress, clarify goals, and provide feedback. It reinforces learning, making the process more structured and the outcomes more predictable.

In a workplace context, the effectiveness of gamified Information Systems in an enterprise setting is attributable to their capacity to maintain user engagement over time. This long-term engagement is fostered by the integration of game design elements that cater to both intrinsic and extrinsic user motivations. These elements create an environment that promotes active user participation, fosters a sense of competition, and encourages collaboration. Furthermore, gamified systems often include continuous feedback and recognition systems, such as points, levels, badges, challenges, and leaderboards. These elements keep users motivated by acknowledging their achievements and instilling a sense of accomplishment. Thus, by providing an interactive and enjoyable user experience, gamified systems enhance user engagement and contribute to their long-term success in the workplace (Suh, 2015).

4.2.3. Co-Authorship Network Analysis by Country

This co-authorship network represents the amount of collaboration between countries. Co-authorship results in synergistic effect. Moreover, collaborative research results in novel scientific output and better quality research papers. In general practice, researchers collectively participate and contribute towards the production of scientific article, which owing to the individual's contribution results in grater quantity and quality of scientific output. The analysis was performed using VOSViewer. Figure 4 shows

the co-authorship network of author-affiliated countries having at least 1 publication between 2013 and 2023.

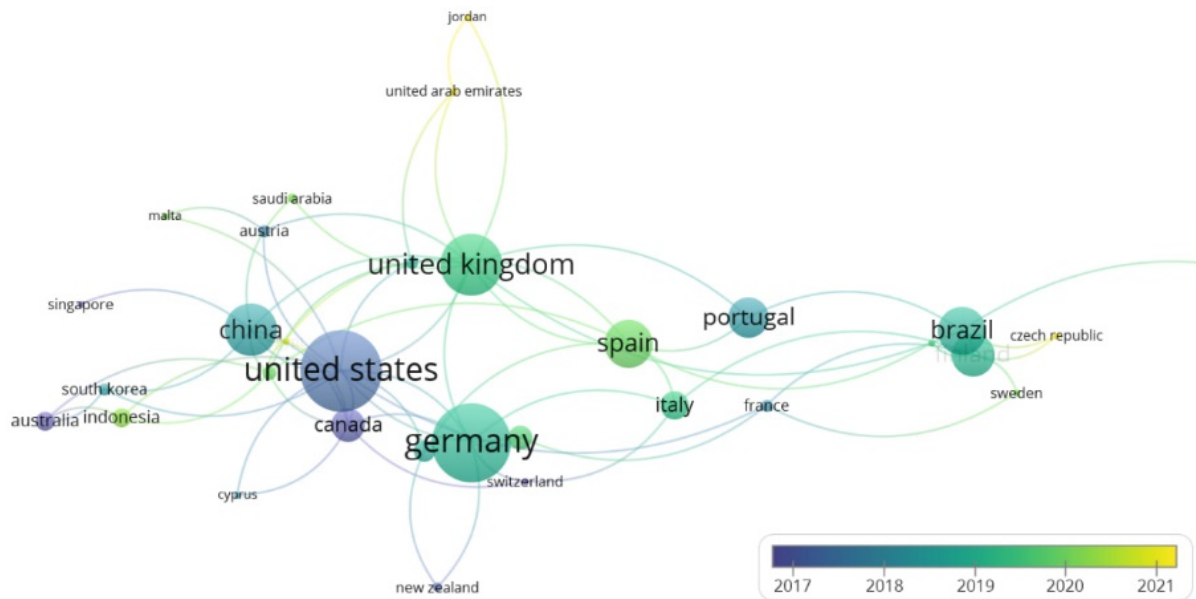


Fig. 4: Co-Authorship Network Analysis of Countries

By examining the contributions of different countries, we can obtain a broader understanding of user experience in the gamification of work. In the United States, researchers have focused on the practical implications of gamification in the workplace. Suh et al. (2014), based in the US, highlighted the central role of aesthetic experience in gamification and the importance of human-computer interaction in designing engaging and usable gamified solutions. This emphasis on aesthetics and usability reflects the American perspective on ensuring employee satisfaction and performance.

While in Germany, researchers have been exploring the psychological aspects of gamification in the workplace. For example, Morschheuser et al. (2016) conducted a study examining the design and psychological outcomes of enterprise gamification. The researchers found that by tailoring the design of gamification elements to individual users, organizations could optimize employee motivation and satisfaction. This German perspective highlights the importance of personalization and understanding user preferences in gamification.

In the United Kingdom, studies have focused on the broader aspects of gamification and its relationship with user experience. Robson et al. (2015) developed a conceptual framework for evaluating the user experience in gamified systems. This framework helps organizations assess the success of gamification interventions and the impact on user experience. The UK approach emphasizes the need for systematic evaluation and understanding of gamification's effectiveness in improving user experience in work settings.

Each country, with its unique research approach, offers insights into the six critical success factors for the gamification of work user experience. In the United States, the emphasis lies predominantly on Human-Computer Interaction and Usability, mirroring its focus on aesthetic experiences and creating engaging gamified solutions that foster employee satisfaction and performance. Germany, with its exploration of the psychological dimensions, underscores the significance of Motivation and User Engagement. Their research emphasizes personalization, suggesting that a tailored Game Element can heighten user satisfaction. The United Kingdom, on the other hand, aligns with Computer-Aided Instruction and systematic evaluations. Their research underscores the necessity of frameworks to gauge user experiences, shedding light on the importance of measuring the effectiveness of Game Elements

and User Engagement. Collectively, these country-specific insights help map out a comprehensive understanding of how different facets of gamification contribute to work user experience on a global scale.

4.3. Discussion

In understanding the implementation and assessment of gamification in the workplace, it is crucial to identify and measure critical success factors that significantly contribute to the user experience. Table 4 presents the critical success factors for implementing gamification in the workplace, providing indicators, and practical implications for effective measurement and understanding.

Table 4: Practical Implications of Critical Success Factors in Gamification of Work User Experience

CSF	Indicator	Practical Implication
Game Elements	Mechanics, Dynamics, Aesthetics, Emotions	Game elements are like the fun ingredients you add to a work task to make it more engaging. By integrating game-like elements that resonate with employees, organizations can tap into their inherent drives and interests. For instance, incorporating personalized challenges or milestones can cater to an individual's need for achievement, while leaderboards or team-based objectives can promote healthy competition and collaboration. Additionally, rewards, whether they're tangible (like bonuses or vouchers) or intangible (recognition or badges), can stimulate a sense of accomplishment and spur further effort. The practical implication here is that understanding and implementing these tailored game mechanics can lead to a more motivated, engaged, and productive workforce. This not only boosts task performance but also fosters a positive workplace culture (Kazhamiakin et al, 2021)
Usability	Learnability, efficiency, memorability, errors, and satisfaction	For gamified systems in work environments to be successful, they should prioritize intuitive interfaces, quick feedback mechanisms, and transparent progress tracking. This focus on usability ensures that users aren't just playing a game but are also empowered to perform tasks efficiently and with greater satisfaction. As businesses look towards gamification as a tool for enhanced productivity and engagement, this emphasis on usability is a cornerstone for practical and positive outcomes. (Gunta et al., 2018)
Human-Computer Interaction	Accessibility, Response Time, Cognitive Load, Error Rate	How a gamified system interacts with its users is vital. If it's easy to use and matches what users expect, they engage more and work better. But if it's hard to use or doesn't meet their needs, they might not use it as much. This interaction, known as HCI, is crucial because it directly affects how satisfied users are and how well the gamified system works overall (Martens et al., 2018)
Motivation	Reward Collection, Badge Acquisition, Leaderboard Position, Challenge Engagement	Motivation is the driving force that encourages people to engage with a system. In a work setting, using game-like elements like challenges, badges, and rewards can boost motivation by making tasks feel more enjoyable and rewarding. When workers are motivated, they do more and stay interested. So, if a company wants their game-like system to work well, they should make it exciting and rewarding for their workers. (Seaborn & Fels, 2015)
User Engagement	Social Interaction, Activity, User Ratings, Content Interaction	Social features, where users can share their progress, compete in friendly competitions, or support each other, reflect human's natural desire for social interaction and recognition. When employees are challenged, recognized for their achievements, given feedback, and allowed to interact socially, they're more likely to be engaged with the task at hand. Increased user engagement often leads to a better user experience. Because when users are deeply involved and invested, they find the process more enjoyable and meaningful, leading to a positive overall experience. (De Paiza et al, 2019)
Computer Aided Instruction	Adaptive Learning Paths, Time Metrics, and Progress Tracking	Using Computer-Aided Instruction in gamification can be a game-changer for workplaces. Think about when a worker starts using a new software tool. Instead of feeling lost or overwhelmed, they get helpful pop-up hints or step-by-step tutorials that guide them. By having these game-like tutorials, employees can learn faster and feel more confident. They don't have to waste time guessing or feeling frustrated. So, for companies, adding these interactive hints can mean better-trained employees in less time. (Tsay et al, 2018)

Each of these critical success factors contributes a unique element to the overall user experience. Human-computer interaction ensures that the user can navigate and interact with the gamified system effectively, which is crucial for increasing a positive user experience. Motivation, both intrinsic and extrinsic, fuels the user's engagement with the gamified system. It encourages continued interaction, persistence in the face of challenges, and a sense of achievement. User engagement, aided by elements like rewards, challenges, and social interaction, leads to higher levels of immersion, ensuring users remain invested in the gamified experience. Usability, which relates to the efficiency, effectiveness, and satisfaction with which specified users achieve specified goals, significantly impacts the user's overall experience. Computer-aided instruction guides the user through the gamified system, providing necessary information and feedback, which, in turn, enhances the learning and engagement process. Lastly, game elements, such as points, levels, badges, challenges, virtual goods, and leaderboards, serve as the backbone of the gamified system. These elements bring the essence of games into a non-game context. By infusing playful competition, setting clear milestones, and offering immediate rewards, game elements heighten the sense of progression and achievement. They appeal to users' competitive instincts and offer tangible markers of their progress and accomplishments. When incorporated thoughtfully, these elements can greatly influence a user's motivation to continue interacting with the system, thereby prolonging their engagement.

Moreover, the interaction of these factors is what truly amplifies the effectiveness of gamification. For instance, a user-friendly interface coupled with relevant game elements can create an experience that not only attracts users but also retains them. Similarly, when computer-aided instruction aligns with intrinsic motivations, users feel empowered and are more likely to invest time and effort into the system. While understanding these factors is important, current literature does present certain inconsistencies and gaps. A big gap in the research is that it mostly studies gamification in education and e-learning, and not so much at how it's used in other regular work settings.

5. Conclusion

In conclusion, this systematic literature review on user experience's critical success factors in the gamification of work has highlighted several essential elements vital for successful implementation and increasing a positive user experience. Within the scope of our study, we undertook a comprehensive review of empirical studies published in journals from 2013 to 2023 using the Scopus database, specifically excluding gamification research focused on augmented reality and virtual reality. The results fall into three broad categories: Technology, Human, and Procedure. They include the Game Element, which captures the mechanics, dynamics, and aesthetics of the gamified environment; Usability, ensuring a user-centric and efficient system interface; Human-Computer Interaction, crucial for strengthening the connection between users and the gamified platform; Motivation, which taps into both intrinsic and extrinsic user drives to engage; User Engagement, imperative for maintaining user involvement and commitment; and Computer-Aided Instruction, designed to streamline user onboarding and facilitate continuous learning within the platform.

For businesses and organizations considering gamification strategies, understanding these critical factors offers tangible benefits. Effective human-computer interaction ensures quick user adoption and satisfaction. Catering to both intrinsic and extrinsic motivators fosters deeper user engagement and loyalty. Enhancing user engagement through varied challenges, rewards, and social interactions ensures users remain committed. Emphasizing usability and continuously refining the system based on user feedback ensures efficiency and user-centricity. Computer-aided instruction, such as tutorials or feedback mechanisms, streamlines user learning, while tailoring game elements to fit audience preferences enhances engagement rates.

While gamification literature is expansive, it reveals certain gaps and inconsistencies that merit attention. Many of the research focuses on education, leaving out gamification in other work areas. This might make current theories and models less versatile. Also many research is Western-centric, neglecting potential cultural variances in gamification experiences. Current studies highlight immediate

gamification benefits but often overlook long-term implications. There's a notable absence of research that considers the interconnectedness of these success factors, often examining them in isolation. Furthermore, as digital landscapes and user behaviors evolve, research needs to adapt, ensuring gamification strategies remain updated and pertinent. Addressing these gaps will enrich both the academic and practical realms of gamification.

We recommend future research to be more inclusive of varied industrial sectors, cultural perspectives, and to take a more holistic approach, recognizing the symbiotic relationship among the critical success factors. Additionally, long-term studies are essential to comprehend the sustained impacts of gamification on work environments.

References

- Alcivar, I., & Abad, A.G. (2016). Design and evaluation of a gamified system for ERP training, *Computers in Human Behavior*, vol. 58, pp. 109-118. <https://doi.org/10.1016/j.chb.2015.12.018>
- Alfitman, Kristanto, R.H., & Widodo, D.E. (2019). Studi Literatur dengan Bibliometrika: Sebuah Pendekatan Mendapatkan Topik Penelitian Menggunakan PoP, Mendeley, dan VOSViewer, *Suluh Media Yogyakarta*, pp. 20-30.
- Alkawsi, G.A., Norashikin, A.S., Baashar, M.Y., Alhussian, H., Alkahtani, A., Tiong, S.K., & Ekanayake, J. (2018). A hybrid SEM-neural network method for identifying acceptance factors of the smart meters in Malaysia: Challenges perspective, *Alex. Eng. J.*, vol. 60, no. 1, pp. 227-240, 2021. <http://dx.doi.org/10.1016/j.aej.2020.07.002>.
- Almeida, F. (2018). Canvas framework for performing systematic reviews analysis. *Multidisciplinary Journal for Education, Social and Technological Sciences*, 5(1), 65. doi:10.4995/muse.2018.9832.
- Alsharo, M., Gregg, V., & Ramirez, D. (2016). Virtual team effectiveness: The role of knowledge sharing and trust, *Information & Management*, vol. 54, no. 4, pp. 479-490. <https://doi.org/10.1016/j.im.2016.10.005>
- Bowser A., Hansen D., Preece J., He Y., Boston C., & Hammock J. "Gamifying citizen science: A study of two user groups", Proceedings of the ACM Conference on Computer Supported Cooperative Work, CSCW, 2014.
- Giunti G., Mylonopoulou V., & Romero O.R. (2018). More stamina, a gamified mHealth solution for persons with multiple sclerosis: Research through design, *JMIR mHealth and uHealth*. <https://doi.org/10.2196/mhealth.9437>
- Gunta K., Sivaselvan B., & Oswald C. "Gamification Paradigm for WebApps Design Framework 2018", 2nd International Conference on Computer, Communication, and Signal Processing: Special Focus on Technology and Innovation for Smart Environment, ICCCS, 2018
- Hamari, J. & Koivisto, J. (2014). Measuring flow in gamification: Dispositional Flow Scale-2, *Computers in Human Behavior*. <https://doi.org/10.1016/j.chb.2014.07.048>
- Hamari, J., Koivisto, J., & Sarsa, H. "Does gamification work? -- A literature review of empirical studies on gamification," *Proceedings of the 47th Hawaii International Conference on System Sciences*, IEEE, 2014. <https://doi.org/10.1109/HICSS.2014.377>
- Mogavi, H., Zhang, R., Haq, Y., Wu, E.U., Hui, Y., & Ma, X. "What Do Users Think of Promotional Gamification Schemes A Qualitative Case Study in a Question Answering Website," Proceedings of the ACM on Human-Computer Interaction, 2022. <https://doi.org/10.1145/3555124>

- Högberg J., Hamari J., & Wästlund E. (2019). Gameful Experience Questionnaire (GAMEFULQUEST): an instrument for measuring the perceived gamefulness of system use, *User Modeling and User-Adapted Interaction*. <https://doi.org/10.1007/s11257-019-09223-w>
- Ibrahim, E.N.M., Jamali, N., & Suhaimi, A.I.H. (2021). Exploring gamification design elements for mental health support, *International Journal of Advanced Technology and Engineering Exploration*. <https://doi.org/10.19101/IJATEE.2020.S1762123>
- Jagušt, T, Botički, I, & Hyo-Jeong S. (2018). Examining competitive, collaborative and adaptive gamification in young learners' math learning, *Computers & Education*. <https://doi.org/10.1016/j.compedu.2018.06.022>
- Kazhamiakin R., Loria E., Marconi A., & Scanagatta M. "A Gamification Platform to Analyze and Influence Citizens' Daily Transportation Choices", *IEEE Transactions on Intelligent Transportation Systems*, 202.
- Koivisto, J., & Hamari, J. (2019). The rise of motivational information systems: A review of gamification research, *International Journal of Information Management*, vol. 45, pp. 191-210. <https://doi.org/10.1016/j.ijinfomgt.2018.10.013>
- LeGrand S., Knudtson K., Benkeser D., Muessig K., McGee A., Sullivan P.S., & Hightow-Weidman L. (2018). Testing the Efficacy of a Social Networking Gamification App to Improve Pre-Exposure Prophylaxis Adherence (P3: Prepared, Protected, emPowered): Protocol for a Randomized Controlled Trial, *JMIR Research Protocols*. <https://doi.org/10.2196/10448>.
- Luo, X. & Hussain, W.M.H.W. (2023). A Bibliometric Analysis and Visualization of Influencer Marketing, *Journal of System and Management Sciences*, vol 13, no 4, pp. 59-73. <https://doi.org/10.33168/JSMS.2023.040>
- Martens M., Rinnert G.C., & Andersen C. (2018). Child-centered design: Developing an inclusive letter writing app, *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2018.02277>
- Mora A., Tondello G.F., Nacke L.E., & Arnedo-Moreno J. "Effect of personalized gameful design on student engagement", *IEEE Global Engineering Education Conference, EDUCON*, 2018. <https://doi.org/10.1109/EDUCON.2018.8363471>
- Mora, A., Riera, D., Gonzalez, C., & Arnedo-Moreno, J. (2015). Gamification: a systematic review of design frameworks, *Journal of Computing in Higher Education*, vol. 29, pp. 1-33. <https://doi.org/10.1109/HICSS.2014.377>
- Morschheuser, B., Hamari, J., & Koivisto, J. "Gamification in crowdsourcing: A review," *Proceedings of the 49th Hawaii International Conference on System Sciences (HICSS)*, 2016. <https://doi.org/10.1109/HICSS.2016.543>
- Panyawanich, K., Maguire, M., & Pradel, P. (2022). How Effective is the Octalysis Gamification to Design Satisfying Electronic Wallet Experiences? *Communications in Computer and Information Science*. Vol. 1655, pp. 323-331. https://doi.org/10.1007/978-3-031-19682-9_42
- Petersen, K., Vakkalanka, S., & Kuzniarz, L. (2015). Guidelines for conducting systematic mapping studies in software engineering: An update, *Information and Software Technology*, vol. 64, pp. 1-18. <https://doi.org/10.1016/j.infsof.2015.03.007>
- Purnomo, M., Maulana, Y.S., Sugiartana, & Tjahjono, E. (2020). AdBispreneur: Jurnal Pemikiran dan Penelitian Administrasi Bisnis dan Kewirausahaan, *Jurnal Universitas Padjajaran*, 89-116.
- Rahayu, R. N. & Tupan, T. (2018). Studi Bibliometrik Artikel Jurnal Perpustakaan Pertanian Periode 2013–2017, *Jurnal Perpustakaan Pertanian*, 44-50.

Reiser, R. A., & Dempsey, J. V., 2013. Trends and Issues in Instructional Design and Technology, Pearson, 3rd Edition. Merrill Prentice-Hall.

Riatmaja, D.S., Suyanto, M., Muafi, & Prajogo, W. (2020). Motivational Affordances to Gamification in Workplace: A Literature Review and Proposed Framework. *TEST Engineering & Management*, vol. 82

Rincon-Flores, E.G., Rodriguez-Rodriguez, N., Santos-Guevara, B.N., Sonoda, A.M., & Quintana-Cruz, H. "Gamit! Interactive platform for gamification," IEEE Global Engineering Education Conference, EDUCON, 2022. <https://doi.org/10.1109/EDUCON52537.2022.9766380>

Robson, K., Plangger, K., Kietzmann, J.H., McCarthy, I., & Pitt, L. (2015). Is it all a game? Understanding the principles of gamification, *Business Horizons*, vol. 58, no. 4, pp. 411-420. <https://doi.org/10.1016/j.bushor.2015.03.006>

Sailer, M., Hense, J.U., Mayr, S.K., & Mandl, H. (2017). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction, *Computers in Human Behavior*, vol. 69, pp. 371-380. <https://doi.org/10.1016/j.chb.2016.12.033>

Saputra, A. (2018). Mengukur Kontribusi Langganan E-Journal Sciencedirect Terhadap Produktivitas Perguruan Tinggi Menggunakan Studi Bibliometrik: Studi Kasus Universitas Andalas, *Jurnal Dokumentasi dan Informasi*, 91-99.

Seaborn, K., & Fels, D.I. (2015). Gamification in theory and action: A survey, *International Journal of Human-Computer Studies*, vol. 74, pp. 14-31. <https://doi.org/10.1016/j.ijhcs.2014.09.006>

Suh, A. "Applying game design elements in the workplace," International Conference on Information Systems: Exploring the Information Frontier, ICIS, 2015.

Suh, A., Cheung, C.M.K., Ahuja, M., & Wagner, C. (2014). Gamification in the workplace: The central role of the aesthetic experience, *Journal of Management Information Systems*, vol. 30, no. 1, pp. 267-299. <https://doi.org/10.1080/07421222.2017.1297642>

Thakur, N. and Han, C.Y. (2021). An Ambient Intelligence-Based Human Behavior Monitoring Framework for Ubiquitous Environments, *Journal of Information*, vol. 12, no. 2, p. 81. <https://dx.doi.org/10.3390/info12020081>

Tondello G.F., Mora A., & Nacke L.E. "Elements of gameful design emerging from user preferences". CHI PLAY 2017 - Proceedings of the Annual Symposium on Computer-Human Interaction in Play, 2017.

Tsay C.H.H., Kofinas A., & Luo J. (2018). Enhancing student learning experience with technology-mediated gamification: An empirical study, *Computers and Education*. <https://doi.org/10.1016/j.compedu.2018.01.009>

Tupan, T., Rahayu, R.N., Rachmawati, R., & Rahayu, E.S R. (2018). Analisis Bibliometrik Perkembangan Penelitian Bidang Ilmu Instrumentasi, *Jurnal Dokumentasi dan Informasi*.

Urh, M., Vukovic, G., Jereb, E., & Pintar, R. "The Model for Introduction of Gamification into E-learning in Higher Education", *Procedia - Social and Behavioral Sciences*, 2015.

van Roy, R., Deterding, S., & Zaman, B. (2019). Collecting Pokémon or receiving rewards? How people functionalise badges in gamified online learning environments in the wild, *International Journal of Human Computer Studies*. <https://doi.org/10.1016/j.ijhcs.2018.09.003>

Werbach, K., & Hunter, D., 2015. The gamification toolkit: dynamics, mechanics, and components for the win. Wharton Digital Press, Philadelphia.

Yahaya, N.A.M., Rambli, D.R.A., & Sulaiman, S. (2022). A Conceptual Game-based Design Model: Game Elements for Enhancing User Motivation, *Journal of System and Management Sciences*, vol 12, no. 4, pp. 281-294. <https://doi.org/10.33168/JSMS.2022.0418>