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ORIGINAL ARTICLE

Adverse effects of using gamification elements in online communities: a scoping review

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Abstract
The game-based research is growing in popularity, however, the number of game elements available to designers is still limited. As an alternative of incorporating novel design approaches derived from games, researchers and practitioners tend to focus on points, badges, and leader boards. The purpose of this paper is to explore adverse effects of using gamification elements in online communities by employing the criteria of Arksey and O'Malley (Int J Soc Res Methodol 8(1):19–32, 2005) five-stage framework that underpins the scoping review approach. Specifically, this paper helps to advance the current knowledge of adverse effects of using gamification elements in online communities in two ways. It highlights (1) a wide variety of areas in which adverse effects of using gamification elements in online communities has been examined, emphasising the rising popularity of the topic, (2) a collection of themes that summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities.

Keywords Adverse effects · Effective strategies · Organisational level · Scoping review · Online communities · Arksey and O'Malley five-stage framework · Gamification elements

1 Introduction

The purpose of this study is to present a detailed scoping review on adverse effects of using gamification elements in online communities by employing the criteria of Arksey and O'Malley (2005) five-stage framework that underpins the scoping

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review approach. Using this scoping review, authors identified two key themes that summarize organisational strategies for responding to adverse effects of using gamification elements in online communities. The use of badges to abstract the life of a community allows us to monitor and analyze how the community is performing (Bista et al. 2014). Gamification for online business must meet the aesthetic standards of its audience. Relationship design must consider motivation as well as encouraging online interaction (Xu 2020). Gamification has some ethical issues, such as exploiting and manipulating students, according to Kim and Werbach (2016). They suggest ways to avoid these issues, although they are not specifically related to education. There are also a set of properties that must be considered when designing gamification for deployment, especially in the Education domain (Toda et al. 2019; Khan et al. 2020).

Although few studies have examined the negative effects of gamification on learners, there are a few that do (Behl et al. 2022a, b; Jayawardena et al. 2022; Jayawardena 2020a, b, c). In addition, there are few studies that analyze the gamified design that is associated with those negative effects. By using two methodological approaches, our scoping review becomes unique by focusing on the adverse effects of gamification elements in online communities. Gamification can also have negative effects on companies and organizations, according to recent research (Chen et al. 2020b). This section provides the basis for future research work that can significantly contribute to the development of the domain of mitigating the adverse effects of gamification elements in online communities (Toda et al. 2019; Khan et al. 2020). As a result, the main purpose of this study is to identify the adverse effects in responding to the requirements of online communities by analyzing the findings from the literature. A scoping review allows the discovery of themes that summarize the organisational level strategies for addressing adverse effects caused by the use of gamification elements in online communities (Toda et al. 2019; Khan et al. 2020; Behl et al. 2022a, b).

2 The negative effects of gamification elements in online communities

Online communities have embraced gamification in recent years as a strategy to engage and encourage active participation (Regalado et al. 2021; Montola et al. 2009). An online community must be encouraged to contribute positively and frequently for it to succeed and develop into a sustainable operation (Montola et al. 2009). The boundaries between games are eroding as they gain in popularity. Pervasive games blend fictional rules with everyday situations (Montola et al. 2009), whereas serious games employ entertaining simulation environments for educational purposes (Mohd et al. 2019). In today's society, gamification is characterized by the application of "game-design elements in non-game contexts" (Deterding et al. 2011), in which "game-like features" are incorporated into non-ludic applications and services. Design techniques have been employed in a variety of fields, including learning (Goehle 2013), work (Stanculescu et al. 2016), health (Stinson et al. 2013),

and crowdsourcing (Melenhorst et al. 2015), in order to improve users' engagement (Darejeh and Salim 2016).

It is not the case that all members of an online community contribute equally to the community's life. It has been noted by Jakob Nielsen that "in most online communities, 90% of users are lurkers, 9% contribute a little, and 1% account for almost all the activity" (Chou 2010; Li 2011). Engagement in a community may be one of the best ways to encourage its members to contribute, thus improving its chances of sustainability (Chou 2010; Li 2011). The increased level of engagement leads to better social connections, which fosters social cooperation among members of the community (Chou 2010; Li 2011). However, it is challenging to increase contributions to online communities (Huotari and Hamari 2012). Gamification is also context-dependent, and the inclusion of game-related elements like points, badges, and leaderboards does not guarantee positive results (Toda et al. 2019; Khan et al. 2020). In order to recommend an appropriate game, gamification experts consider variables such as user profiling. As of yet, no studies have examined how gamification may negatively impact learners in an educational setting (Toda et al. 2019; Khan et al. 2020). A gamified system or task should take into account the following factors: Declining Effects, Cheating the System, Privacy, and Task Quality. These concerns, however, pertain more to gamified online environments than to specific educational settings.

3 Literature review

According to Arksey and O'Malley's framework, the review involved (2.1) defining the research question, (2.2) identifying relevant studies, (2.3) selecting studies, (2.4) charting data, and (2.5) summarizing and reporting the results (Arksey and O'Malley 2005). It has been shown that previous systematic reviews of gamification elements in online communities have served to summarize and communicate findings and to determine the need for systematic reviews or other types of research (Arksey and O'Malley 2005) to evaluate the effects of these elements (Arksey and O'Malley 2005). Scoping reviews, as their name suggests, are ideal for determining the extent of literature and studies available on a particular topic, as well as providing an overview (broad or detailed) of its focus. A scoping review is useful for examining emerging evidence when it is unclear what other, more specific questions can be addressed by a more precise systematic review (Arksey and O'Malley 2005). As well as presenting the types of evidence that address and inform practice in the field, they can also describe the research methodology.

Hence, authors selected the scoping review approach under the assumption of collecting the evidence that address and inform practice in the gamification field to find out the adverse effects of gamified elements within the online communities (Arksey and O'Malley 2005; Munn et al. 2018). In the same way, systematic literature reviews are conducted by review groups with specialized skills, which identify and retrieve international evidence relevant to a particular question or questions and appraise and synthesize the results to inform practice, policy, and in some cases,

further research (Munn et al. 2018). Table 1 further shows the difference between a scoping review and a systematic literature review as follows.

4 First step: identifying the research questions

Identifying the research questions will be the first step of this study. Authors examined critical components contributing to adverse effects of online communities using gamification elements. A search strategy was developed by the research team. Considering feasibility and comprehensiveness of the scoping process, authors decided to focus on scientific articles published in English (Arksey and O'Malley 2005). The following initial research questions were provided to guide the search to ensure that a broad range of literature relevant to the topic was collected: (1) What is the status of scholarly research on adverse effects of using gamification elements in online communities? To ensure that a broad range of literature relevant to the topic was collected, authors provided (2) a wide variety of areas in which adverse effects of using gamification elements in online communities has been examined, emphasising the rising popularity of the topic? and (3) What are the key themes that summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities ?

When considering the first research question (What is the status of scholarly research on adverse effects of using gamification elements in online communities?), it was identified that not only empirical studies, but also the theoretical or conceptual work, are reported in the scoping review findings, despite their importance in the research process and interpretation (Arksey and O'Malley 2005). The heterogeneity of the field might have prevented our search strategy from capturing some relevant studies. As part of our search strategy and study selection criteria, authors conducted a preliminary literature review to minimize this risk (Arksey and O'Malley 2005). Further, the second research question (A wide variety of areas in which adverse effects of using gamification elements in

Table 1 The difference between a scoping review and a systematic literature review

Scoping review	Systematic literature review
A scoping review is generally conducted in order to identify and analyse gaps in a given knowledge base, as examining what has not been investigated or reported requires an exhaustive examination of all available sources	Research synthesis, or systematic reviews, can be broadly defined as identifying and retrieving international evidence related to a particular question or questions and examining and synthesizing the results to give insight to practice, policy, and in some cases, further study
A scoping review aims to identify and map the available evidence	To determine whether current practice is based on relevant evidence, to assess its quality, and to address potential uncertainties or variations in practice, systematic reviews may be conducted
Used to clarify key concepts/definitions in the literature	***Used to c***onfirm current practice/address any variation/to identify new practices

Source: Developed based on Arksey and O'Malley (2005); Munn et al. (2018)

online communities has been examined, emphasising the rising popularity of the topic?), identified that studies reporting on offline consumer participation in innovation processes, studies exploring innovation intermediaries, and studies looking at crowdfunding practices were excluded from the scoping review process (Toda et al. 2019; Khan et al. 2020). The third research question of (What are the key themes that summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities ?) was devoted to identifying the key themes that summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities.

Through this scoping review, authors were able to identify two major key themes which summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities as gamified elements which enhance the consumer engagement and gamification theories.

5 Second step: identifying relevant studies

The second step is to identify the research that are relevant for this scoping review. Search keywords should be defined broadly to obtain a "broad coverage" of current literature, according to the selected model in this study. Key topics and search terms were created to acquire information on discovery of negative gamification elements in online communities. There are various types of systematic literature reviews, among them were structured reviews (Canabal and White III 2008), framework-based reviews (Paul and Benito 2018; Udall et al. 2020) and meta-analysis (Barari et al. 2021). Accordingly, scoping reviews are the most suitable review type for this study, as scoping reviews examine the extent, type, and nature of research before undertaking a systematic review (Castro et al. 2018; Jayawardena 2021; Jayawardena et al. 2020; Jayawardena and Jayawardena 2020).

Further, the authors examined the literature for a period of ten years (2012 to May 2022). The primary objective of this scoping review is to identify the negative effects of gamification on online communities based on a thorough analysis of prior literature (Arksey and O'Malley 2005). This is also supported by previous evaluations that used ten-year scoping reviews, the results of which linked the previous research with the most recent strategies (Castro et al. 2018; Facey-Shaw et al. 2020). Studies published by leading management and marketing organizations were reviewed using the software program 'publish or perish. Authors searched the database using several keywords, including negative effects of gamification, adverse gamified elements and online communities, online vs negative game effects, gamification, and adverse effects of using gamification elements in online communities, organisational level strategies in responding to adverse effects of using gamification elements in online communities. All results were confined to peer-reviewed studies in English. The literature evaluation took three months to complete, with the completion date been marked as 1st of June 2022.

6 *Third step:* selection of the studies

The literature evaluation took one months to complete, completing in July 2022. An overview of the preliminary results from the various databases is presented in Table 2.

Peer-reviewed English-language articles formed the basis for the analysis. Some of the keywords used by the authors were disadvantages of gamification elements in online communities; drawbacks of gamified elements among online communities; Online communities' drawbacks with gamified elements; Gamification's drawbacks for online communities and Gamification have some drawbacks in online communities. There was a total of 341 studies listed. To remain within the scope of the study, all papers were not included. In the initial abstract screening method, some of the studies have been eliminated without further consideration.

7 Forth step: data charting and collation

As part of Arksey and O'Malley's (2005) scoping review framework, selected articles are charted. The summary for each article includes the author, year, context, theory, and characteristics that show its limitations and suggestions. The inclusion criteria include the studies which focused on management aspects of gamified elements towards online communities. Further, authors considered studies which focused on organisational level online community-based strategies in mitigating the negative effects of gamified elements. Also, authors included the studies which are published during the period of 2012 to 2022. To avoid using obsolete material in the study, such as gaps in the realm of the gamification and online platform literature. This is also supported by previous evaluations that used ten-year literature reviews, with the results interlinking the previous research with the most recent findings (Bassiouni and Hackley 2014; Sanakulov and Karjaluoto 2015). This scoping review comprised 32 studies based on inclusion and exclusion criteria.

The PRISMA (The Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines have been incorporated into the selection of studies. The PRISMA guidelines been used as this scoping review intends to identify the most recent research gaps in game-based online communities. In doing so, this paper augments, recent related work looking at review articles in general by placing a greater emphasis on the role of theory (Bassiouni and Hackley 2014; Sanakulov and Karjaluoto 2015).

Table 2 A preliminary search of databases yielded the following results

Online database	The number of articles
Web of science	341
Total	341

Initially, the authors found a total of 341 publications. As a result of careful categorisation using Endnote, another group of 22 publications was identified as duplicate (Selçuk 2019). To select the papers that focused on the online communities which used gamified elements, the abstract screening technique was applied. Initially, the abstracts were reviewed, and articles that did not provide a special focus on circulation with reference to online communities (121) were excluded from the study. Publications on problematic contents in marketing and management such as the advantages or benefits of gamified elements on online communities; gamified elements circulation in other platforms excluding social media were dismissed owing to out-of-scope issues. Papers on gamified elements within the organisational context written in non-marketing context such as food science, computer science and education were removed due to out-of-scope aspects. As a result, out of the remaining 198 articles, 166 were found to be not suitable due to out-of-scope concerns. The remaining articles were evaluated using the PRISMA criteria listed below (Fig. 1).

The selected studies include thirty-one (32) journal articles. Several future gaps were established based on the foregoing discussion of management aspects of gamified elements towards online communities. Next, authors classify the selected studies as follows.

8 Fifth step: summarising and reporting findings

The fifth and final step of Arksey and O'Malley (2005) scoping review is summarizing and reporting findings. This is presented under Table 3.

9 Discussion of the findings

This scoping review was organised to address the pre-determined research questions developed using the Arksey and O'Malley (2005) five-stage framework of, *identifying the present status of scholarly research* on adverse effects of using gamification elements in online communities? To ensure that a broad range of literature relevant to the topic was collected, authors provided, (2) a wide variety of areas in which adverse effects of using gamification elements in online communities has been examined, emphasising the rising popularity of the topic? and (3) What are the key themes that summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities ? Hence this section provides the answers for these three study constructs based on the identified literature as follows.

10 The present status of scholarly research on adverse effects of using gamification elements in online communities?

This scoping review, which covered a broad range of disciplines, indicates that gamification is most effective when points, badges, and leader boards are used (Tobon et al. 2020; Xu et al. 2020). In addition to rewards and challenges, points, badges,

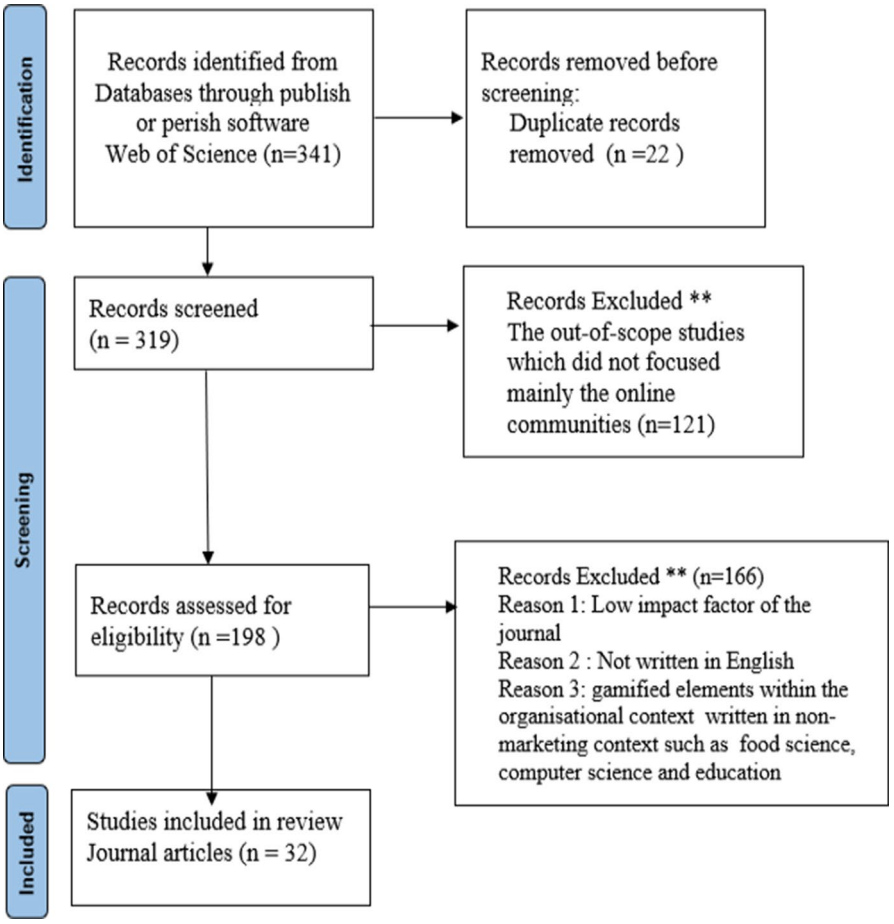

Fig. 1 Flow chart of the literature search process

and leader boards were the most extensively tested gamification elements (Zainuddin et al. 2020). Gamification works according to the Self-Determination Theory (SDT) and the Technology Acceptance Model (TAM) (Tobon et al. 2020; Xu et al. 2020). Consumers receive points for loyalty and rewards programs, which can be redeemed for products through gamification and these types of programs are therefore primarily concerned with gamifying the reward system (Jayawardena et al. 2021; Xu et al. 2020).

Further our findings emphasise the importance of identifying the adverse effects of using gamification elements in online communities (Jayawardena et al. 2021; Xu et al. 2020). In Table 1 authors see that attitude, enjoyment, and usefulness are the three factors which predict gamification most accurately. Brand attitudes toward gamification are influenced by intent, enjoyment, and usefulness (Baptista and Oliveira 2019). Gamified experiences can enhance customer engagement if designed

Table 3 Summary of the studies

Source	Key concepts	Theory	Method	Findings
Heijden (2004)	Comparing user acceptance models for productivity-oriented (or utilitarian) and pleasure-oriented (orhedonic) information systems	Motivational theory Deci (1975)	Surveys	The perception of enjoyment and ease of use are more important in determining intentions to use a hedonic information system than the perception of usefulness
Li and Fitzmaurice (2012)	Introducing a software event driven finite state machine to model a user's progress through a tutorial	None	Surveys	As a teaching medium, educational programs are more likely to produce positive learning outcomes
Bista et al. (2014)	Implemented a program to assist welfare recipients in their transition from one payment to another	None	Experiments	Gamification, utilizing badges to provide an abstraction of the life of a community, enables us to monitor and analyse how the community is doing
Hamari al. (2014)	A review of gamification studies	None	Literature Review	Game context refers both to the core service or activity being gamified as well as the motivational levels based on the user's characteristics
Oprescu et al. (2014)	Gamified workplaces have been identified as a promising strategy for enhancing workplace wellbeing based on a review of research literature across disciplines coupled with expert opinion	Literature Review	Literature Review	If the employees are also able to provide performance data from their standpoint, using a gamified process would provide immediate feedback and allow for immediate improvement

Table 3 (continued)

Source	Key concepts	Theory	Method	Findings
Urh et al. (2015)	An overview of gamification in higher education was presented	Behaviorist learning theory	Literature Review	Gamification is an effective means of implementing e-learning using technology In addition, a lack of user profile analysis, inappropriate design methods, and gamification schemes that are too simple may result in applications not achieving the desired results
Krasulak (2015)	Examined the potential of using gamification in selection, the willingness of young adults entering the labour market to participate in such recruitment, and the factors determining their willingness to participate	None	Surveys	In this recruitment process, no significant differences were found between the independent variables adopted and respondents' willingness to participate
Mansouri et al. (2016)	A framework is proposed for categorizing existing gamified systems	Self -determination theory	Questionnaire	Gamified website is providing more personalized experience which could bring disadvantages when personalizing the user profile and gamification elements
Love et al. (2016)	Reviewed the feasibility of including social media and gaming features in a parenting program, Triple P Online	None	Community-Based Participatory Research approach	It is extremely difficult to access the Internet in neighbourhoods of poverty; parents should have access to computers and browsers that are up to date, adequate broadband, and training in internet literacy

Table 3 (continued)

Source	Key concepts	Theory	Method	Findings
Toda et al. (2017)	Analysis of the negative effects associated with gamification and gamified learning	None	Experiments	A major negative impact of less effective ranking systems within learning environments was loss of performance
Yang et al. (2017, 2020)	To design gamified incentive hierarchies that engage users optimally, select the ranking dispersion according to their needs	goal setting theory	Interviews	The state of high performance occurs immediately after achieving a goal and often lasts until the next goal is within reach
Furdu et al. (2017)	Study cases are presented to demonstrate the relationship between motivation and engagement of students as well as gamification	None	Surveys	The introduction of leader boards in a given situation (students, year, and specialization) decreases motivation
Platonova and Bērziša (2017)	Analyzed the impact of gamification on software development projects	None	Case studies	A gamification approach is used in the software development stage to encourage developers and testers to perform their tasks more effectively, but is considered a costly approach for other reasons than its usefulness
Mulcahy et al. (2018)	Increases practitioners' and academics' understanding of gamification and serious m-game design	The Self-Determination Theory	Surveys	Gamified apps and serious mobile games are designed and evaluated using this framework

Table 3 (continued)

Source	Key concepts	Theory	Method	Findings
Hinton et al. (2019)	The potential legal implications of gamified employee motivation systems were examined	Literature Review	Literature Review	The design of an enterprise gamification system should provide employees with sufficient information and clarity and promote positive workplace relationships. Implementing enterprise gamification systems should be carefully planned with employee feedback and consultation
Nenadić (2019)	In Croatia, assess the level of interest in using gamification to recruit and select students	None	Surveys	Gamification should not be viewed as an option, but as the norm for selecting the best candidates
Khan et al. (2019)	Evaluated the gamified recruitment	Game theory	Surveys	Among the survey respondents, reliability was viewed as an advantage and stress as a disadvantage of gamified recruitment
Högberg et al. (2019)	Gamification and in-store mobile advertising	None	Experiments	Gamification does not always increase the likelihood of a user taking action. In fact, gamification requires active participation from the user; otherwise, it may lead to a decrease in the likelihood of converting on offers
Baptista and Oliveira (2019)	Gamification and serious games: a meta-analysis	None	Meta analysis	According to the research, brand attitudes towards gamification can be predicted primarily by three factors: intent, enjoyment, and usefulness

Table 3 (continued)

Source	Key concepts	Theory	Method	Findings
Xi and Wang (2019)	Two types of hand gestures were studied in this research: surface gestures and motion gestures	Embodied cognition theories	Experiments	A congruent visual presentation and reward setting should be aligned with hand gesture designs in mobile marketing games
Kim and Ifenthaler (2019)	Technology-based assessment in the classroom: an analysis of the impact and reliability of such systems	None	Surveys	There has been a lot of progress made over the past ten years with game-based assessment, but does anyone know what challenges lie ahead for it?
Helmefalk (2019)	Gamification is developed from being a concept that only seeks to motivate people to alter their behaviour to one that can be used in an innumerable variety of contexts	Game theory	Literature Review	Considering motivation as a prerequisite for other psychological mediators may not seem so strange, as the word itself implies a course of action
Leclercq et al. (2020a, b)	Analyzed the impact of in-gamification perceived justice on member contributions	Social exchange theory	Experiments	Having high levels of distributive justice may be detrimental to performance, reducing game-related uncertainty, thereby reducing the enjoyment of gamified practices
Xu (2020)	SMART categorizes gamification features by reviewing the prior literature	SMART model, user-centred design theory, work design theory	Surveys	Designing relationships requires not only considering how to motivate online interaction, but also how to motivate offline interaction

Table 3 (continued)

Source	Key concepts	Theory	Method	Findings
Lithoxoidou et al. (2020)	By organizing collective activities that improve teamwork among employees in industrial premises, a pleasant and friendly atmosphere can be created	Tiny Habit theory	Surveys	Using gamified social collaboration platforms as depicted in this paper, this paper aims to increase employee engagement by stimulating motivation and only providing positive feedback
Zainuddin et al. (2020)	Analyzed the literature on gamification in educational settings	None	Literature Review	Gamified online platforms face implementation challenges and participation challenges
Tobon et al. (2020)	Evaluated the literature on gamification to determine if it influences consumer decisions	The Self-Determination Theory the Technology Acceptance Model	Literature Review	Gamification in consumer contexts uses mechanisms like rewards and challenges
Leclercq et al. (2020a, b)	Prepare a set of foundational propositions based on a micro-foundational approach to attract Gamification-based research	The Self-Determination Theory	Conceptual Review	Gameplay as the micro foundation of the gamefic experience
Feng et al. (2020)	The aim of this study was to determine whether game elements can improve the consumer engagement in fitness applications	The Self-Determination Theory	Longitudinal field study	Although the two stimuli used in this study create comparable and incommensurate representations of the two applications, they differ in other aspects, such as the design of the user interface, usefulness, and ease of use Engagement and loyalty may be affected by different functionalities
Chen et al. (2020a, b)	An analysis of digital game-based learning	None	Meta analysis	In terms of game-based learning, it is effective for science subjects, but not so much for social sciences

Table 3 (continued)

Source	Key concepts	Theory	Method	Findings
Whittaker et al. (2021a)	Gamification of a sustainable energy app to encourage sustainable behaviour	Affect-as-information theory	Surveys	Gamified platforms should include both conditional and outcome flow dimensions, according to the model of flow, to enhance customer engagement
Bojd et al. (2022)	Studied the effect of gamified challenges on the weight-loss outcome	Dynamic model, using a system generalized method	Surveys	It is the role of leader boards to create social comparisons and motivate (discourage) users to engage in exercise (diet) challenges

correctly. Marketing and app designers who use gamification should also include outcome flow dimensions in their platforms to increase customer engagement (Whittaker et al. 2021a). In addition, a lack of user profile analysis, inappropriate design methods, and gamification schemes that are too simple may result in applications not achieving the desired results in online learning context (Urh et al. 2015).

A gamification approach is used in the software development stage to encourage developers and testers to perform their tasks more effectively but is considered a costly approach for other reasons than its usefulness (Platonova and Bērziša, 2017). It is extremely difficult to access the Internet in neighbourhoods of poverty; parents should have access to computers and browsers that are up to date, adequate broadband, and training in internet literacy (Love et al. 2016). Gamified website is providing more personalized experience which could bring disadvantages when personalizing the user profile and gamification elements (Mansouri Ebrahimi 2016). It was the loss of performance that was the most prevalent phenomenon, making less effective ranking systems within learning environments have a negative psychological impact (Toda et al. 2017). However, implementation issues and participation issues can be seen in the gamified based online platforms (Zainuddin et al. 2020). Cybersecurity issues and high costs were identified as the major adverse effects of gamification in online communities.

11 The wide variety of areas in which adverse effects of using gamification elements in online communities has been examined

The authors of this scoping review identified a wide range of areas where adverse effects of using gamification elements in online communities have been studied. For example, gamification, utilizing badges to provide an abstraction of the life of a community, enables us to monitor and analyse how the community is doing (Bista et al. 2014). For low-engaged community members who place high values on rewards, distributive justice may reduce game-related uncertainty, thereby making gamified practices less enjoyable (Leclercq et al. 2020a, b). Gamification must conform to the aesthetic standards of the audience. Motivating online interaction also involves motivating offline interaction (Xu 2020). Gamification is not only about the core service or activity but also about how motivation levels differ between users (Hamari et al. 2014), and educators attribute positive learning outcomes to the instructional design of educational programs rather than games as instructional mediums (Li et al. 2012). The perception of enjoyment and ease of use are more important in determining intentions to use a hedonic information system than the perception of usefulness in online gamified communities (Heijden 2004) and it is noteworthy that the introduction of leader boards in a given situation (students, year, and specialization) decreases motivation (Furdu et al. 2017).

The use of gamification in software development encourages developers and testers to perform their tasks more effectively, but it is considered a costly approach for other reasons. (Platonova and Bērziša, 2017). The design of an enterprise gamification system should provide employees with sufficient information and clarity and promote positive workplace relationships. Implementing

enterprise gamification systems should be carefully planned with employee feedback and consultation (Hinton et al. 2019). If the employees are also able to provide performance data from their standpoint, gamifying a process would provide immediate feedback and allow fast progress (Oprescu et al. 2014), therefore, literature further re-instated that gamification should not be an option, but rather a norm (Nenadić 2019).

Using technology to implement e-learning is effective through gamification (Urh et al. 2015). In addition, a lack of user profile analysis, inappropriate design methods, and gamification schemes that are too simple may result in applications not achieving the desired results (Urh et al. 2015). It has been found that men held a more positive view of gamification when considering gamified recruitment in online communities, whereas female respondents viewed gamification more as an entertainment tool than a recruitment tool (Khan et al. 2019). Participants in the survey viewed reliability as an advantage and stress as a drawback of gamified recruitment (Khan et al. 2019). When considering the gamified e-marketing, gamification does not always increase the likelihood of a user acting (Högberg et al. 2019). In fact, gamification requires active participation from the user; otherwise, it may lead to a decrease in the likelihood of converting on offers (Högberg et al. 2019). Gamification in consumer contexts generally uses mechanisms such as rewards and challenges (Tobon et al. 2020).

Considering motivation as a prerequisite for other psychological mediators may not seem so strange, as the word itself implies a course of action (Helmefalk 2019). Feng et al. 2020 studied whether integrating game elements into fitness apps will improve engagement. Though the two stimuli in this study are commensurate and incommensurate in terms of game elements, they may differ in other aspects, such as user interface design, usefulness, and ease-of-use. Engagement and loyalty may be affected by different functionalities (Feng et al. 2020). Gamified experiences can be designed to enhance customer engagement using Flow. For gamification to maximize customer engagement, marketers and app designers should include both conditional and outcome flow dimensions (Whittaker et al. 2021a). Games for mobile marketing should align hand gestures with visual presentation and reward setting (Xi et al. 2019). Gamification is influenced by attitudes, enjoyment, and usefulness. Gamification attitudes are influenced by intent, enjoyment, and usefulness (Baptista and Oliveira 2019).

12 The key themes that summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities ?

Through this scoping review, authors were able to identify two major key themes which summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities.

12.1 Gamified elements which enhance the consumer engagement

There is a tendency for elements, mechanisms, and mechanics to be interchangeably used (Baptista and Oliveira 2019; Jayawardena et al. 2021). Some definitions on gamified elements, use terminology interchangeably when, in fact, they are distinct concepts. As the authors propose a new taxonomy the authors define gamification objects as "the building blocks of a gamified system, which typically comprise items, characters, scripts, visual assets, and so on" and game mechanics as the rules of the game (Liu et al. 2017). The mechanics of gaming are the mechanisms that explain how elements (objects), rules (mechanics), and gamer characteristics can combine to produce an experience that is engaging for players (Betzwieser et al. 2022). An example is Li (2018)'s study of whether gamification will increase Starbucks apps' adoption. With the new Starbucks app, users can earn points and badges (game elements). These gamification elements increased app adoption (Liu et al. 2017).

A gamification mechanism is the reward that accounts for the behaviour change (Liu et al. 2017). According to Reiners et al. (2015), there are two types of gamifications: reward-based and meaningful. Reiners et al. (2015) define reward-based gamification as using badges, levels, leader boards, achievements, and points to condition real-world behaviour. This type of game-based motivation is intrinsic motivation, and, although it affects behaviour short-term, it stops having an effect as soon as the reward ends (Skinner et al. 2018).

12.2 Gamification theories

In gamification and online engagement literature, self-determination theory and technology acceptance theory have been identified as the most prominent theories (Tobon, et al. 2020). Games, according to the literature reviewed here, must include one or more of the following elements: points, levels, leader boards, achievements/badges, stories/themes, and avatars (Xu et al. 2020). It is unclear whether the rewards are symbolic or can be redeemed for money or products (Xu et al. 2020). The level represents a progression of increasingly difficult scenarios that can be reached, or unlocked, based on the performance of the player to increase the intrinsic motivation levels (Xu et al. 2020).

In order to allow social comparisons to be made, the leaderboard provides information about the performance of other participants. Badges are earned by participants when they reach certain levels (Xu et al. 2020; Tobon, et al. 2020). There is a clear distinction between storytelling/theme, which is the setting for the game that allows the participant to understand the context, and avatars, which are the virtual representations of the participants (Xu et al. 2020). Gamification systems can be effectively used if a variety of mechanisms are used, including feedback, competition, rewards, challenges, social interaction, and rules; there are also certain conditions inherent in the system, such as voluntary participation and challenging objectives (Yang et al. 2017, 2020).

The motivation for gamification is frequently viewed as extrinsic in nature, where acquiring points, badges, or other rewards may explain why individuals engage in such activities (Seaborn and Fels 2015; Xu et al. 2020). In spite of this, some researchers have suggested that these types of incentives can serve as a source of intrinsic motivation (Seaborn and Fels 2015; Xu et al. 2020). Kim and Ahn 2017, for instance, have demonstrated that feedback as an implicit reward increases participation in a loyalty program more effectively than specific rewards, such as points. It has been suggested by Olsson et al. (2015) that gamifying systems increase engagement with an application. This behavioral change may be due to intrinsic motivation.

According to the Technology Acceptance Model (TAM), users engage with a website that is easy to use, helpful, and useful (Xu et al. 2020; Jayawardena et al. 2021). There is no doubt that humans are naturally resistant to change, so learning a new way to perform a task can be a challenge. However, if companies design their e-commerce platforms to be simple and user-friendly, consumers are likely to adopt these programs more readily. The study identifies the factors that influence behavior (Xu et al. 2020; Jayawardena et al. 2021). Therefore, all behaviour is preceded by an intention, and the intention is determined by attitudes about the behavior, subjective norms, and perceived control over the behavior (Tobon, et al. 2020). In the Gamification of Consumer Contexts, this theory has been employed to explain consumer engagement with gamified products. Huotari and Hamari (2012) reported that badges are an effective way to engage consumers with gamified products by comparing their performance with others. As a result, subjective norms motivate people to perform better (Kalutharawithana, and Jayawardena 2017; Jayawardena 2020a, b, c; Pereira et al. 2022; Jayawardena 2020a, b, c).

13 Future research directions

Through this study, authors found several future research directions under consumer behaviour, business strategy, online brand community behaviour and extrinsically motivated consumers engagement.

14 Consumer behaviour research

The application of gamification has recently attracted the attention of practitioners and researchers (Hoffman and Novak 2009). Various market research agencies predict that gamification will continue to grow in the future as companies apply it to their activities. Gamification is typically focused on customers, so it naturally relates to consumer behaviour (Jayawardena et al. 2021; Tobon et al. 2020). It is possible to use games to engage online consumers in a specific context and for a limited period of time (Xu et al. 2020; Jayawardena et al. 2021). Researchers will examine how to respond to adverse effects of gamification elements in online communities in the future (Xu et al. 2020; Jayawardena et al. 2021). Researchers should study consumer behavior over time in extended gamification applications.

15 Business strategy

Gamification is part of a business strategy to build long-term customer loyalty (Xu et al. 2020; Jayawardena et al. 2021). It will take further analysis to determine whether and how long-term gamification campaigns can be effective. After the gamification campaign ends, will the consumer remain loyal? Tobon, et al. 2020, warn that extrinsic motivation (when people act for a reward) is not effective over the long haul since behaviours cease to exist without a reward. Although longitudinal studies present a risk, only one has been found (Tobon, et al. 2020; Xu et al. 2020; Jayawardena et al. 2021). In contrast, there are few studies that examine gamification from the perspective of business strategy formation. Since gamification is heavily influenced by information technologies (Seaborn and Fels 2015; Xu et al. 2020).

16 The online brand community behaviour

Jang et al. (2018) mentioned that an online brand community has been analyzed for two years, and the result of the analysis has led to the conclusion that gamification elements such as points, leader boards, and badges explain why online brand communities are active. It was found that social benefits, belonging, and feeling connected were the strongest predictors of this behavior (Furdu et al. 2017). Leisure activities, such as virtual co-creation, can be influenced by intrinsic and extrinsic motivations (Guay et al. 2000). Consumers who are intrinsically motivated are mainly motivated by the activities themselves. (Gagné and Deci 2005) Persistent contributions to the community, fun, genuine interest in the medium and content, less intentional orientation, time filling and recreational activities, and hedonistic satisfaction are intrinsic motivations (Füller 2010).

17 Extrinsically motivated consumers engagement

The extrinsically motivated consumers engage in activities to achieve a separate objective (Wong-On-Wing et al. 2010). Such behaviours include situational involvement, selective and intentional engagement, cognition, and interest in content, work, and utilitarian benefits (Hoffman and Novak 2009). Rewards and goals also reinforce behaviour (Hoffman and Novak 2009). The motivations of some individuals can be internalized and lead to active commitments (Behl and Pal 2016; Behl et al. 2020; Sharma et al. 2020; Behl and Singh 2014; Jayawardena et al. 2023; Jayawardena 2022; Behl et al. 2023). Voluntary acceptance of a task and its intrinsic value (Deci and Ryan 2000). Intrinsic rewards are often small monetary prizes or social rewards, such as a positive reputation in the community (Dahlander and Magnusson 2005; Hertel et al. 2003).

The study has limitations, which suggest directions for future research (Behl and Dutta 2019; Behl et al. 2019; Yeravdekar and Behl 2017; Behl 2020; Choudhury

et al. 2021). Firstly, the study was conducted in the context of adverse gamification elements within online communities. It may be possible to extend the scope of our literature review to other topics in the future, such as gamification in travel or education, to enhance the validity of our findings.In addition to user adverse experiences and negative attitudes, future researchers may take into account mediators such as perceived trust, perceived benefits, and perceived sacrifices in the relationship between online gamified features and perceived value.

18 Practical implications

Gamification drives desired user behaviour through game mechanisms and design (Behl et al. 2020; Sharma et al. 2020). Several studies used source credibility in different gamification settings (Lee 2012). Personality of the lecturer (qualifications, experience), comments or recommendations provided by the lecturer, scrutiny and assessment of issues was identified in education context (Lee 2012). To enhance the impacts of games, it is important to understand the antecedents and motivations of user engagement (Wong-On-Wing et al. 2010). To investigate gamification, authors propose integrating and extending theories from previous online game literature, user participation literature, and non-game contexts of the specific gamified application design (Behl et al. 2020; Sharma et al. 2020). Hence it is recommended for game-based e-learning designers to consider gamified user behaviour when designing the e-learning platforms.

Further, this scoping review revealed two major key themes summarizing the organisational level strategies for responding to adverse effects of gamification elements in online communities. In order to monitor and analyze how a community is performing, authors use badges to abstract its life (Bista et al. 2014). Gamification for business online must meet the aesthetic standards of the intended audience. In addition to encouraging online interaction, motivation must also be considered when designing relationships (Xu 2020). According to Li et al. (2012), educators can attribute positive learning outcomes to the design of educational programs rather than games. Among online gamified communities, enjoyment and ease of use are more important than usefulness (Heijden 2004), and using leader boards reduces motivation (Furdu et al. 2017; Pawar et al. 2017; Mendon et al. 2021; Bhattacharya et al. 2017; Jayawardena et al. 2023; Jayawardena 2022; Behl et al. 2023; Behl and Pal 2019).

Gamification improves the performance of software developers and testers, but it is regarded as a costly solution despite its effectiveness (Platonova and Bērziša, 2017). Employees need sufficient information and clarity from enterprise gamification systems in order to foster positive relationships at work. Gamification systems should be implemented with employee feedback and consultation (Hinton et al. 2019). According to the literature, gamification should not be an option, but rather become the norm (Nenadić 2019) by providing immediate feedback and enabling immediate progress. In the past decade, developers and decision-makers have realized that games and game-like appeals can serve as appropriate gamifications to attract people to virtual idea communities. Therefore, gamification gained

momentum and was widely implemented into virtual idea communities (Furdu et al. 2017; Pawar et al. 2017; Mendon et al. 2021). It is important to remember, however, that gamification doesn't necessarily lead to positive results. As a result, obstacles and challenges associated with gamification must be considered, but they are often ignored (Furdu et al. 2017; Pawar et al. 2017; Mendon et al. 2021).

19 Theoretical implications

Based on this scoping review, which covered a wide range of disciplines, gamification is most effective when points, badges, and leader boards are used (Tobon et al. 2020; Xu et al. 2020). Aside from rewards and challenges, points, badges, and leader boards were the most extensively tested gamification elements (Zainuddin et al. 2020). Gamification is based on the Self-Determination Theory (SDT) and the Technology Acceptance Model (TAM) (Tobon et al. 2020; Xu et al. 2020). Loyalty and rewards programs reward consumers with points that can be redeemed for products through gamification (Jayawardena et al. 2021; Xu et al. 2020). In addition, our findings emphasize the need to identify the adverse effects of using gamification elements in online communities (Nigam et al. 2022; Jayawardena et al. 2021; Xu et al. 2020).

According to Table 3, attitude, enjoyment, and usefulness are the three factors that most accurately predict gamification. Gamification attitudes are influenced by intent, enjoyment, and usefulness (Baptista and Oliveira 2019; Jayawardena et al. 2022). Gamified experiences can enhance customer engagement when designed correctly. Gamification platforms can increase customer engagement by using outcome flow dimensions (Whittaker et al. 2021a). A lack of user profile analysis, inappropriate design methods, and overly simple gamification schemes can also result in applications not achieving the desired results in online learning contexts (Urh et al. 2015). In addition, this study contributes to Arksey and O'Malley's (2005) five-stage framework for scoping reviews by being the first to focus on adverse effects of gamified elements in online communities. In subsequent contexts, scoping reviews aim to provide an overview of a potentially large and diverse body of literature, whereas systematic reviews seek to gather empirical evidence from a relatively smaller number of studies that address a specific research question (Arksey and O'Malley 2005; Higgins et al. 2011; Jayawardena and Karunarathne 2022).

Table 4 illustrates the future research perspectives based on the theoretical and practical implications.

20 Conclusion

From this scoping review, authors were able to identify two major key themes which summarise the organisational level strategies in responding to adverse effects of using gamification elements in online communities. Gamification, in which badges are used to abstract the life of a community, allows us to monitor

Table 4 The future research prepositions

Topics	Major themes	Future research questions
Future directions based on the *Theory*		
Theoretical foundation	Need to interlink Self-Determination Theory (SDT) and the Technology Acceptance Model (TAM) to further assess human social cognition stages such as persuasion, memory, information comprehension as well as the recalling and recognition abilities of game-based e-learning	How can social psychology theories be extended to explain the consumer social cognition stages such as (persuasion, memory, information comprehension, recalling and recognition) regarding game-based e-learning
Theoretical foundation	Need to establish links with the traditional technology adoption models	How can technology adoption models link with the gamified online communities?
Future directions based on the *Context*		
Online game-based platforms	Need for more research based on characteristics of gamified online communities	How does the indirect effect of format or gamified platform changes effect on ad attitudes via heightened perceived ad novelty? Exploring the conditions under which the novelty effects of gamified platforms could be maximized Exploring telepresence and interactivity in relation with the colourfulness of mental imagery
Effects or outcomes of gamified e-learning	Need for more research based on effects or outcomes of gamified e-learning	What are the factors or explanations for improved user experience for gamified e-learning techniques?
Future directions based on the *Method*		
Nature of method applied	Need for more research based on qualitative techniques	How can qualitative exploratory methods expand the current knowledge on online game-based platforms?

and analyze how the community is performing (Bista et al. 2014). Gamification of online business must meet the aesthetic standards of the intended audience. Moreover, when designing relationships, motivation must be considered for both online and offline interaction in addition to encouraging online interaction (Xu 2020).

It can be argued that educators can attribute positive learning outcomes to the design of educational programs rather than games (Li et al. 2012). In online gamified communities, the perception of enjoyment and ease of use are more important than the perception of usefulness (Heijden 2004), and it is noteworthy that the use of leader boards in a given situation (students, year, and specialization) reduces motivation (Furdu et al. 2017; Pawar et al. 2017; Mendon et al. 2021; Bhattacharya et al. 2017; Jayawardena et al. 2023; Jayawardena 2022; Behl et al. 2023; Behl and Pal 2019).

In the software development stage, gamification is used to encourage developers and testers to perform their tasks more effectively but is considered a costly solution despite its usefulness (Platonova and Bērziša, 2017). An enterprise gamification system should provide employees with sufficient information and clarity and foster positive workplace relationships (Muthuri et al. 2022; Hillebrand and Westner 2022). Gamification systems should be implemented carefully with employee feedback and consultation (Hinton et al. 2019). In addition, gamifying the process would give immediate feedback and allow for immediate progression (Oprescu et al. 2014), therefore, literature further re-establishes that gamification should not be an option, but rather a norm (Nenadić 2019).

Gamification is an effective way to implement e-learning using technology (Urh et al. 2015). Moreover, a lack of user profile analysis, poor design methods, or gamification schemes that are too simple may result in applications not achieving the desired results (Urh et al. 2015). According to Khan et al. 2019, female respondents saw gamification more as an entertainment tool than a recruitment tool when considering gamified recruitment in online communities (Khan et al. 2019). It was found that survey respondents saw reliability as an advantage of gamified recruitment and stress as a disadvantage (Khan et al. 2019).

In e-marketing campaigns, Gamification does not always increase the likelihood of users taking action (Högberg et al. 2019). Feng et al. 2020 examined whether game elements could enhance consumer engagement with fitness applications. Despite the fact that, the two stimuli used in this study accurately reflect the two applications by using comparable and incommensurate aspects of the games, they may differ in other respects, such as usability, usability design, and ease of use. The level of consumer engagement and loyalty may be affected by different functionalities (Feng et al. 2020). It is possible to use a flow chart to provide insight into how gamified experiences should be designed to increase customer engagement. To increase the level of customer engagement, marketers and app developers should consider including both conditional and outcome flow dimensions in gamified platforms (Whittaker et al. 2021b). In the pursuit of enhancing consumer satisfaction, mobile marketing games should be designed so that hand gestures are aligned with congruent visual presentation and reward settings (Xi et al. 2019). To predict gamification most accurately, attitudes,

enjoyment, and utility should be observed. Three factors can be used to predict brand attitudes towards gamification: intent, enjoyment, and usefulness (Baptista and Oliveira 2019).

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