



Gamification in the Job Training Context: A Review of Underlying Theories and a Classification of Outcomes

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Master Thesis – Work, Organizational & Personnel Psychology

[S3644308]

[07] [2022]

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Abstract

Gamification is a trend that has enjoyed a rising interest in research and organizations alike. With the advent of the Covid-19 Crisis, there has been an ever more present need to effectively train employees online. One promising approach to increasing the efficacy of organizational training is the use of Gamification. This systematic literature review added to the literature by analyzing 16 articles to explore the current theoretical background of gamification in organizational training in addition to classifying the outcomes. The theoretical background was categorized into motivational and learning theories as well as overarching frameworks. Outcomes were classified into psychological outcomes (i.e., motivation) and performance outcomes (i.e., knowledge retention). Lastly, a critical view of the effectiveness of gamification in organizations was presented. The study contributed to the field of gamification by clarifying the theoretical framework of gamification in job training. Moreover, an overview of associated outcomes was provided to guide researchers in the field.

Keywords: gamification, job training, gamified interventions, effectiveness

Gamification in the Job Training Context: A Review of Underlying Theories and Outcomes

Gamification is defined as the application of game-like elements in non-game environments (Deterding, 2011). Within the last 15 years, research on this topic has proliferated. While most research has focused on the application of gamification in the context of health and especially education (Landers & Landers, 2014), business and more specifically human resource departments have been slow to catch up (Blštáková & Piwowar-Sulej, 2019).

Training in Organizations

In order to investigate the effects of gamification on organizational training, it is essential to have a clear picture of both concepts. Organizational training is defined as the attainment of skills, concepts, or attitudes ultimately increasing performance in an organizational environment (Goldstein, 1980). There are a number of positive effects of a constantly learning workforce, it allows organizations to innovate, adjust and reach goals (Salas., 2012). Thus, organizations generally use training in order to maintain a competitive advantage (Boudreau & Ramstad, 2005). Further, training practices have been linked to measures of organizational effectiveness across nations (Aguinis & Kraiger, 2009).

However, training exists on a dimension from effective to not effective; therefore, two important assertions about training for the remainder of this articles are: (1) properly designed training works and (2) how the training is designed and implemented can greatly influence the effectiveness (Salas et al., 2012). Contemplating the second assertion, we turn to gamification and its role in job training.

History and Definition of Gamification

Even before the concept of gamification was established, researchers have tried to learn about the motivational powers of game elements. In 1981, Malone published a paper investigating factors towards intrinsically motivating instruction. In this analysis, he deconstructed popular computer games to see which factors influenced the motivational level of his students to keep engaging with them. Game variables such as feedback, scoring, and immersion were found to positively influence students' motivation, and overall, the interventions containing game elements were found to be more interesting to students compared to their regular counterparts. Around 2002, the term gamification was first coined by a British computer programmer and inventor (Szyma, 2013), but it took academic research nearly one decade to arrive at a proper definition of gamification (Deterding et al., 2011). Now the question arises, what exactly is gamification? And how does it differ from other concepts such as serious games that are also used in training?

These questions can be answered by focusing on three distinguishing characteristics of gamification. First, an integral part of gamification is the use of game elements. These can be viewed as the puzzle pieces that constitute a game. Each game consists of a number of these pieces that can be isolated for the sake of gamification. Some examples are collaboration, competition, and story as more general game elements. In recent times, more concrete elements such as leaderboards, points, and badges have become popular (Kapp, 2016). However, to be efficacious, gamification needs to be embedded into a larger process. The 6'Ds of Gamification (Hunter & Werbach, 2012) is a popular framework for developing gamified systems. It starts with (1) defining business objectives, (2) delineating target behaviors, (3) describing intended players, (4) devising short-term engagement loops, (5) incorporating fun and lastly (6) deploying appropriate tools. Next, it is important to note that gamification is a process of applying game

elements, rather than an end product itself. This is a major point distinguishing it from the concept of serious games. Thirdly, gamification refers to the application of these elements in a “non-game context”. This refers to scenarios that are meant for purposes other than fun such as education, health care, or organizational training (Armstrong & Landers, 2017). To call it gamification instead of a serious game, the primary objective of the activity must remain stable throughout the process (Werbach, 2014). To illustrate, a gamified language study program needs to maintain its primary objective of learning the language. If another objective such as “competing in game tasks” now competes with it, we leave gamification territory. Having established how gamification is conceptualized, we turn next to the application of gamification in the organizational setting.

The Impact of COVID-19 on Job Training

The COVID-19 pandemic has forced organizations to rely more on electronic solutions for basic daily activities such as communication and learning. (Agrawal et al., 2020) Training, specifically, has shifted considerably into the virtual space. The online format poses some challenges to motivation and engagement if not designed effectively (Humala, 2017). This could result in employees not engaging effectively with the provided learning content by skipping through it or not even completing it in the first place. Thus, leading to worse training outcomes in general. Gamification, however, offers a promising solution to these problems as it has been reported to positively influence motivation and improve learning outcomes (Alsawaier, 2018, Brull et al., 2017). When used effectively, the enhanced efficacy of the training is beneficial for both the employee’s development and the organization’s performance (Armstrong et al., 2015, Landers et al., 2017). Considering the potential benefits businesses may gain if they adopt a

gamification strategy in their training interventions, provides a strong argument for this approach.

The Application of Gamification in Organizational Training

One of the first applications of gamification in the organizational context was during the cold war when the Soviet Union established a point-based system of competition to increase productivity in their factories (Nelson, 2012). For the last couple of decades, technology has become an increasingly integral part of our world. It shapes the ways we relate and work subsequently influencing how organizations operate internally and also in exchange with society (Folan & Browne, 2005). Due to the rising importance of digital media, gamification using computer elements has become a viable resource to enhance the learning experience of employees in organizational training. Gamification has already been applied to many different contexts of organizations, this includes talent management, motivation and performance, knowledge management, teamwork and lastly training (Murawski, 2021). In terms of talent management, research has shown that gamification can aid in assessing the soft skills of employees which in turn can decrease the costs of bad hires (Georgiou et al., 2019). Further, researchers have made the argument that employees who like playing online games might have better coordination and leadership skill that they can draw upon in the daily work context (Chamorro-Premuzic et al., 2019). Most studies so far have looked at the role of employee motivation and engagement. Research has shown that gamification can play a powerful role in motivating employees (Armstrong et al., 2017, Brull et al., 2017, Dincelli et al., 2020). Gamified systems are hypothesized to do this by engaging the user fully into the activity, this is often referred to as an experience of flow (Csikszentmihalyi, 1985). Having established the effects on motivation, researchers now turn towards the use of gamification in training, investigating if the

increases in motivation and engagement lead to improved training outcomes in job training. The theory of gamified learning (Landers, 2014) uses this link to hypothesize better learning outcomes of gamified educational interventions. Moreover, Jorge and Sutton (2017) show that gamification empowers employees to feel self-confident with succeeding in assignments and increases motivation in an education environment.

In conclusion, previous research established effects of gamification on motivational and learning processes (Hamari et al., 2014). In the organizational context, the enhanced efficacy of training is beneficial for both the employee's development and the organization's performance (Armstrong et al., 2015, Landers et al., 2017). In the next paragraphs, the existing literature will be reviewed.

Theoretical Frameworks Underpinning Gamification

Motivational Theories

In the current literature, a wide array of theories is used to explain and develop gamified interventions. These can be broadly classified into motivational and learning theories. Historically, theories explaining gamification have focused more on the motivational aspect such as self-determination, flow and autotelic experience, and goal setting (Matallaoui et al., 2017). The main theoretical argument is that gamification emulates game-like experiences such as flow and fun through game elements applied to the non-game environments where they may increase engagement and enjoyment of processes such as learning and education. There has been an ongoing effort to synthesize the mentioned motivational frameworks with game design research to explain the psychological outcomes of gamification (Aparicio et al., 2012). Earlier studies

demonstrated that gamification can be a potent means to engaging employees and inspiring them to advance work-associated abilities (Dubey et al., 2016; Ęrgle, 2016; Jabagi et al., 2019)

Self-Determination Theory. Self-Determination Theory (SDT) posited by Ryan and Dewis (2012) is a motivational theory that links intrinsic motivation to the fulfillment of three identified human needs, autonomy, competence, and relatedness. In regard to learning, autonomy is felt when requirements such as meaningful choice, control, and ownership over one's learning are fulfilled. Studies by Ng (2016) have shown that autonomous motivation can lead to higher cognitive processing as well as self-determined behaviors. The second need, competence is related to being skillful and efficacious when performing activities related to value outcomes (Chen, 2019). Applied to the learning context, confidence is gained when one feels like they are making progress toward goals associated with learning. Moreover, positive feedback (i.e., recognition for success) can lead to higher perceived competence, which is in turn a strong predictor of performance and learning (Chen, 2019). Lastly, relatedness is defined as the desire to feel connected and supported by other people (Yang et al. 2019). Relatedness is developed when circumstances of authentic and caring connections to other people are established (Thongmak, 2021).

Previous research has already investigated the relationship between SDT and gamification (Hamari et al., 2014; Kapp, 2012; Nicholson, 2012). Kapp and colleagues (2012) state that the social dimension of learning (the feeling of being respected and cared for) is very important for the process of training. Gamification can increase feelings of relatedness by incorporating multiplayer mode, or by employing teamwork tasks (Treiblmaier et al., 2018). However, there needs to be an appropriate alignment of challenge and skill (competence) as well as the opportunity to make their own decisions (autonomy) in order to fulfill criteria of intrinsic

motivation. When these conditions are fulfilled, individuals will become immersed in the experience, which can be described as a flow experience.

Flow Theory. The concept of flow, which was developed by Csíkszentmihályi (1985) is defined as one's optimal holistic experience when performing a particular task. There are three conditions, that have to be met for flow to occur. These are a clear set of goals, the balance between the perceived challenges, and clear and immediate feedback (Lai et al., 2021). Previous research investigating the relationship between flow and gamification focused mainly on education setting (Oliveira et al., 2021). A recent literature found varied results, stating that most studies are of exploratory nature with uneven standards for quantifying the flow state (Oliveira, 2021). When looking specifically at the field of job training, the few studies conducted point in a positive direction (Kim, 2020; Iacono et al., 2020; Lai et al., 2020; Silic & Lowry, 2020), further suggesting methodological barriers as a main problem in current research. The present review will investigate these studies to clarify relationship.

Learning Theories

Next, learning theories such as Bloom's Taxonomy or the Social Cognitive Theory (Bandura, 1977) could play an equally important part when designing effective interventions. The only theory that has tried to explain the relationship between gamification and learning outcomes is the Theory of Gamified Learning (Landers, 2014). It postulates that gamification positively influences motivation, which in turn increases learning outcomes. Still, this is only one explanation of the possible effect of gamification on learning outcomes, this review seeks to synthesize the different mentioned learning theories in the literature, to provide an overview of the current theoretical understanding.

While most research has focused so far on more distinct features of gamification such as game elements, the theoretical framework has been neglected (Matallaoui et al., 2017). Hence, a detailed analysis of the specific factors and theories, that contribute to successful gamified interventions, in a training context, is needed. So, the first question that this literature analysis investigates is: *What are the underlying theories of gamification in the context of organizational training?*

Outcomes and Effectiveness

In addition, the review will examine the outcomes of gamified interventions, as the underlying theories used to explain and produce gamified interventions ultimately aim to explain how to achieve certain outcomes. Some of the most referenced outcomes are increases in motivation, engagement, and learning (Sailer & Homner, 2020). Osatuyi and colleagues (2018) report that gamification has been effective in changing behaviors, learning new problem-solving skills, and increasing engagement, across multiple organizational settings. However, there are currently mixed results in the literature regarding the potential outcomes of gamification leading to disagreement about the effectiveness of gamified interventions (Liu et al., 2017). Especially in terms of the anticipated performance outcomes, such as increases in knowledge retention and behavior, earlier studies have found different effects (Sailer & Homner, 2020), resulting in an ambiguous picture of the actual effects of gamification.

This confusion must be resolved which is why this review sought to identify and categorize outcomes and report on the effectiveness of gamified interventions. Thus, the next two questions this review asked are: *What kind of outcomes do gamified interventions produce? Is gamification an effective tool for increasing training outcomes in organizations?*

Research Question and Objectives

This paper aimed to conduct a systematic literature review to synthesize and categorize the existing literature in the field, providing a solid theoretical base from which further research can be carried out. Systematic literature reviews provide a thorough methodological framework for synthesizing existing studies by reducing the limitations of specific studies, such as selection bias. Furthermore, they offer a broad perspective of multiple studies and existing theories (Siddaway et al., 2019).

The objective of this systematic literature review was to shed light on the underlying theoretical framework of gamification in the context of organizational training and expand upon the investigation and classification of outcomes. It was guided by three main questions; 1) What are the underlying theories of gamification in the context of organizational training? 2) What kind of outcomes does gamification in organizational training produce? And lastly, 3) is gamification an effective tool for increasing job training outcomes?

Method

To investigate the aforementioned questions, this study adopts the framework of a systematic literature review, examining suitable articles in the field of gamification applied in the job training context. The PRISMA framework was assumed to provide a sound framework for the review process. This agenda was chosen as it is widely regarded as the state-of-the-art framework for conducting a systematic literature review. It is constituted of four main steps, namely identification, screening, eligibility, and inclusion (Page et al., 2020).

Criteria of Eligibility

As the field of gamification in organizational settings is quite young (Deterding, 2011), there was no year limit added. Only peer-reviewed primary studies of qualitative and quantitative

nature were considered to increase the validity of the selected articles. Aiming to make the review as accessible as possible, only articles in English were studied. Conversely, grey literature such as conference proceedings were omitted. The review focuses on gamification in the job training context, hence studies referring to serious games, virtual reality, and game-based assessments were excluded. This extends to the application of gamification in other contexts such as education or healthcare. Table 1 summarizes the specific inclusion and exclusion criteria used for the literature search process, recognizing, and assessing the most relevant studies.

Table 1

Inclusion and Exclusion Criteria for the Literature Search

Criteria	Inclusion	Exclusion
Results of the Literature Search	Boolean Search String: “gamifi*” AND “training” AND “organization” OR “work*”	Other
Literature Study	Published in Peer-Reviewed Journals	Other
Language	English	Other
Investigation Object	Application of Gamification in Job Training	Serious Games, Non-Employee Populations
Context	Organizational Training Context	Other

Search Strategy & Setting

The focus of the review is on gamification in organizational training. Hence, to perform the literature search process, a selection of the most reputable databases for scientific literature were used; PsycInfo, EBSCOHost, Web of Science and Scopus. These databases were selected

as they contain most of the peer-reviewed journals in the organizational psychology context. Moreover, Boolean search terms were used to scan the existing article base.

Search Term

Boolean operators were applied for the automatic search in the literature databases to execute the literature search. The search string “Gamifi*” AND “Training” AND “Organization” OR “Work*” was utilized as the primary search string across the mentioned databases. The root “Gamifi*” was chosen in order to include all possible alterations and abbreviations of the word gamification. The idiom “training” captures the specific focus of the paper in terms of reflecting on gamification literature in the specific context of job training. The terms “organizational” and “work” were used to narrow the field of application to an organizational environment.

Quality Assessment

Statistical Quality assessment of the studies was omitted, as this review focuses on qualitative studies next to quantitative studies in the field. Currently, there is little guidance from the literature on how to evaluate both qualitative and quantitative studies in the same review. However, the articles were scanned to ensure that they met the criteria and covered the correct target population and setting to the best of our knowledge.

Screening Process

There were 1294 articles identified in the first round, combined in the four major databases. A total of 30 duplicates were automatically removed. Next, the records were screened for title and abstract to identify relevant articles for closer inspection. Lastly, 113 articles were reviewed based on a full-text screening process resulting in a total of 16 final articles. The main reasons for exclusion were irrelevant research topics (e.g.,

serious games) as well as extraneous populations (e.g., students), and irrelevant types of articles (review articles). The final 16 articles were then classified by research type, research field, theoretical framework, and outcomes (See Table 2 for further information). The literature search was completed in February 2022. Figure 1 explains the process and selection of pertinent research articles used in this systematic literature review.

Figure 1

Literature Search and Screening Process

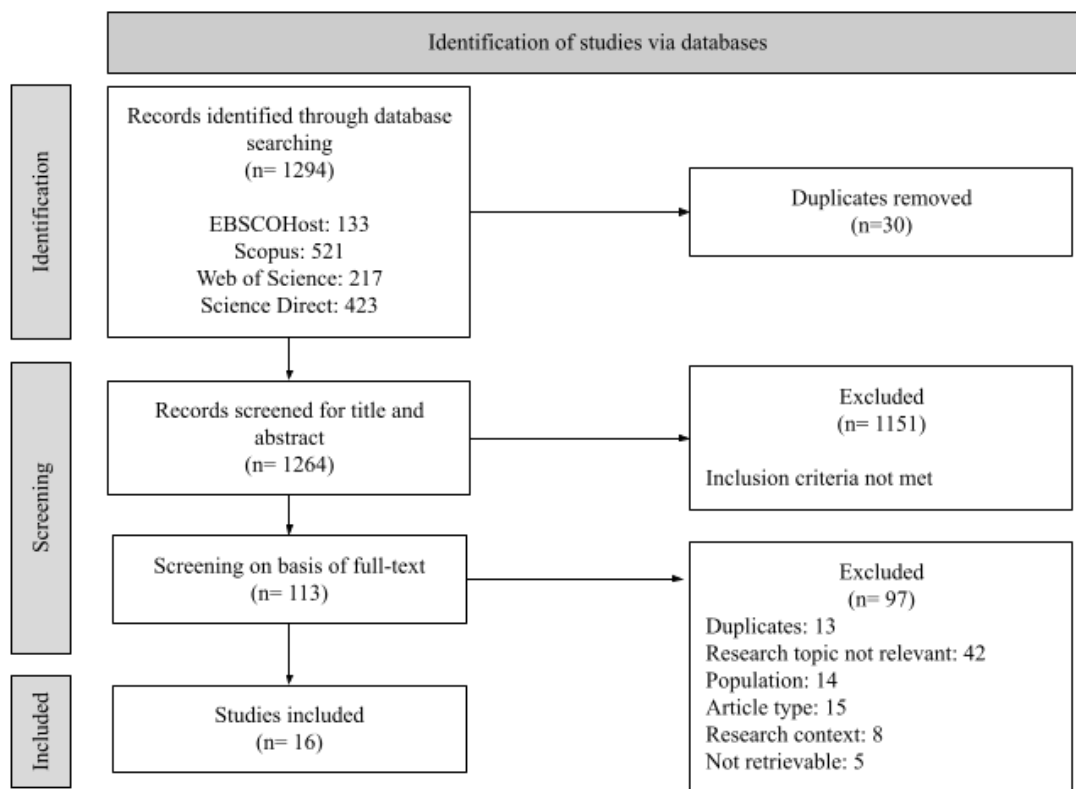


Table 2. Full Article Details

Author(s)	Year	Research Type	Research Field	Measures	Approach	Participants
Armstrong et al.	2017	Experimental Study	Company Laptop Security Training	Declarative & Procedural Knowledge, Attitude towards technology, Satisfaction	Quantitative	N = 301
Baxter et al.	2017	Field Study	Security Compliance Training	Satisfaction, Performance	Quantitative	N = 158
Brull et al.	2017	Quasi-Experimental Study	Nursing Orientation Training	Knowledge	Quantitative, Qualitative	N = 115
Cechella et al.	2021	Experimental - Case Study	Instructional Procedure for Bank Manager	Learning outcome	Quantitative	N = 53
De Oliveira et al.	2019	Survey Study	Regional Labor Court Member Online Training	Performance & effort expectancy, facilitating conditions, familiarity, intention to use gam. in media	Quantitative	N = 62
Dincelli et al.	2020	Longitudinal RCT	SETA Artefact Training of Employees	Instrumental & experimental measures	Quantitative	N = 1,718
Iacono et al.	2020	Case Study	Office Automation in Media Company	Case Study	Qualitative	-
Kim	2020	Survey Study	Gamified MSLP for Automotive Workers	Flow, Challenge, Relationship, Usability, intention of use, CUI	Quantitative	N = 293

Table 2. (Continued)

Author(s)	Year	Research Type	Research Field	Measures	Approach	Participants
Kornevs et al.	2019	Case Study	Procurement process in the construction sector	Performance Scores on application of business models	Quantitative	N = 16
Lai et al.	2020	Experimental Study	point-of-care ultrasonographic training	Theoretical knowledge, skill retention	Quantitative	N = 31
Miller et al.	2018	Case Study	IT Service-Desk Training	Service Desk Performance Survey	Quantitative, Qualitative	N = 27
Nair and Mathew	2021	Experimental Study	Organizational Training in Indian Companies	Learning, reaction, learner motivation	Quantitative	N = 60
Newcomb et al.	2019	Case Study	Professional Development System for Direct Care Staff	employee engagement, turnover, social validity, fiscal impact, CBA	Qualitative	N = 120
Santos et al.	2021	Exploratory study	Perception on effectiveness and results	Perception of Results & efficiency of gam. training	Quantitative, Qualitative	N = 56
Silic and Lowry	2020	Field Study	Organizational Security Training	appropriate challenge, HSMAM framework	Quantitative	N = 420
Thongmak	2021	Survey Study	Online Learning of Organizational Workers	LLL, SDT, organizational online learning readiness	Quantitative	N = 255

Results

The analysis of the theoretical background showed that there are immense differences in the depth and breadth of theoretical thinking applied to gamified interventions (Figure 2). Out of the 16 articles, only eight studies seriously illuminated motivational background and seven articles explained the learning theoretical implications of their interventions by use of theories (See Table 4). Moreover, as Reigeluth and Carr-Chellman (2009) explained, there is also a need for thorough methodological thinking behind the instructional framework when designing gamified interventions. However, only six out of the 16 studies actively incorporated such a framework in their design. Comparing outcomes of gamification is increasingly hard when there are steep differences in the thoroughness of the broader theoretical framework concerning the intervention. In terms of outcomes, most studies (over 90%) investigated psychological outcomes in their study of gamification, while there were only 56% of studies that looked at performance measures. All of the studies found positive results for psychological outcomes, conversely there were mixed results for performance outcomes.

This review will first examine the theoretical background and afterwards the different outcomes. Lastly, an evaluation of the effectiveness of gamification will be given.

Motivational Theories

Out of the 16 studies, half of them discussed motivational theories when explaining the effects of gamification. The two most prominent theories were self-determination theory and flow theory. However, also the theory of reasoned action and related theories such as the UTAUT were represented.

Self-Determination Theory

Self-Determination Theory proved to be the most accepted theory for explaining the motivational aspect of gamified interventions. Three out of the 16 studies explicitly referred to this theory while many implicitly mentioned associated concepts.

Thongmak (2021) directly investigated the relationship between gamification, SDT, and lifelong learning intentions in a survey study. He found that gamification impacted all three of the aforementioned needs of SDT which then in turn affected employees' lifelong learning intentions. In their case study, Nair, and Matthews (2021) also drew on SDT focusing specifically on the distinction of two dimensions of motivation, namely, autonomous motivation and controlled motivation. Autonomous motivation relates to intrinsic motivation and extrinsic motivation of value gain while controlled motivation refers to classical expectations of rewards or punishment. They propose that learners should aim at autonomous motivation which is driven by the fulfillment of the three needs of competence, autonomy, and relatedness, to increase learning outcomes. The findings point in a similar direction to Thongmak's study, meaning that learner motivation at least partially mediates the impact of gamification on learning (Nair & Matthews, 2021)

Kim (2021) also theorized that SDT takes a central role in explaining learners' motivation. He relates it to the concept of Flow (Csikszentmihalyi, 1985). In his study, he explored possible motivational antecedents of flow (relationship, usability, challenge, competition & compensation) and how these are related to the gamification of a Mobile Social Learning Platform and the continuance usage intention. Three predictors significantly mediated the relationship between flow and CUI, namely relationship, usability, and challenge. Also, flow significantly positively increased CUI suggesting it is a powerful motivational influence to be explored in gamification. Moreover, Kim (2021) draws upon the theory of intrinsic and extrinsic

motivation by Ryan and Deci (2000). It postulates those game elements that are meaningful to users can induce intrinsic motivation, regardless of external rewards. This theory is now part of the broader SDT framework

The three studies found a mediating effect on the psychological needs between gamification and learning, pointing to evidence for the theory of gamified learning, which postulates that gamification increases learners' motivation thereby improving learners' reaction to the training and increasing learning (Landers, 2014). In addition, the concept of continued use intention (Kim, 2021) and lifelong learning intention (Thongmak, 2021) seem to be related. It is important to note, that they do not directly refer to performance outcomes of learning, but postulate longer use patterns that will eventually lead to higher voluntary learning and thus better learning outcomes.

Flow Theory

The concept of Flow has been associated with gamification for some time. However, only in recent years, studies out of the organizational space explicitly picked up on it. From the 16 investigated studies, four discussed the Theory of Flow (Csikszentmihalyi, 1985).

As previously mentioned, the Theory of Flow and SDT are closely linked (Kim 2021). In their study of a gamified system for ultrasonographic training, Lai, and colleagues (2021) found that the gamified condition experienced increased motivation compared to the control group. Participants said that they "felt motivated" to learn the procedure. This sense of motivation is important to fully engage the participants in their learning process. This shows that the experience of flow is one of the ultimate destinations of game design. When people are deeply immersed in their activities, they are said to be getting "into the flow" (Lai et al., 2021)

Another more recent adaptation of the Theory of Flow is the Hedonic-Motivation System Adoption Model (HSMAM) which is used in the study of Silic and Lowry (2020) using gamification to improve organizational security training. HSMAM builds on flow theory by revising the concept of cognitive absorption (Argawal & Karahanna, 2000). Cognitive absorption is proposed to be a key mediator between perceived ease of use and behavioral intention to use. In their study, Silic and Lowry (2020) extended the HSMAM model by the concept of motivation fulfillment, and hence the concept of appropriate challenge is also closely linked to flow as it refers to the second postulation of flow experience (see above). The authors propose that there is an inverted U-shape relationship in the relationship between the level of challenge and experience of flow. They confirmed this relationship experimentally, which implies a point of optimal immersion where the challenges and skills of the learner match to provide the optimal experience of flow and engagement.

Based on this reasoning, Iacono and colleagues (2020) used the two aforementioned concepts of self-determination and flow for the motivational aspect of their approach study to enhance engagement in corporate training.

Theory of Reasoned Action

Another motivational theory, the theory of reasoned action is introduced by De Oliveira and colleagues (2019) in their study investigating the effect of gamification on behavioral intention to use training. The theory of reasoned action explains that behavioral intentions are based on subjective attitudes and norms (Fishbein, 1979). This theoretical framework is used as a dependent variable for intention to use gamified distance courses. They found that three main predictors were causally related to the behavioral intention; the UTAUT (Unified Theory of Acceptance and Use of Technology) proposes several factors that impact continued usage

intentions. Both models try to explain usage behavior related to technology acceptance in this case. Performance expectancy refers to the benefits of technology when performing learning activities. Effort expectancy relates to the ease of use and facilitating conditions are people's perceptions of the resources and support available. These three factors were found to be causally related to continued usage intentions. Again, it is noted that there are stark similarities between these predictors and the aforementioned ones regarding flow and SDT pointing to an underlying conceptual framework.

Learning Theories

Less than half of the studies (seven out of 16) explicitly discussed learning theories. Only the Theory of Gamified Learning proved to be quite established, it was mentioned by three different studies. Next, Kolb's Experiential Learning Cycle was mentioned twice. The other theories were only mentioned once, suggesting that the framework of learning theories is yet to be fully developed.

Theory of Gamified Learning

The only theory that directly relates gamification and learning is the Theory of Gamified Learning (ToGL) by Landers (2014). It postulates that gamification increases learner motivation which then leads to learners' reaction to the training, hence increasing learning. Nair and Matthews (2021) found support for the ToGL in their study of gamified training outcomes. Learner motivation, measured by the constructs of valence and instrumentality was found to be significantly higher in the gamified condition. Only expectancy was not significantly different, still, the gamified condition had a higher mean score. This suggests that learner motivation may

mediate the impact of gamification on learning. Thus, Nair and Matthews (2021) concluded that their study provides support for the ToGL.

Armstrong and Landers (2017) set out to explore the use of narrative to improve learning. They also used the theory of gamified learning (Landers, 2014) which implies that gamification does not affect learning directly but stimulates a learning-related behavior by a moderating or mediating process. They did not find significant effects in terms of performance outcomes, which they explain in accordance with the ToGL. One possibility for the null effect might be that game fiction does not affect declarative knowledge learning. According to the ToGL instructional content and game characteristics can have independent effects on learning outcomes, but in this study, they were operationalized as one construct "training design". Further, their proposed attitude moderator following the Technology-Enhanced Training Effectiveness Model (Landers, 2017) was not supported, suggesting that at least in the context of narrative gamification, the attitude toward technology does not influence the relationship between gamification and learning outcomes.

In an experimental case study applying gamification to the training of bank managers, Cechella and colleagues (2021) also used the ToGL to identify which game elements would produce the most effective results, as there is no business specific training framework of gamification to rely on. The Theory of Gamified Learning is the only currently available theory that integrates instructional design with the choice of game elements.

Universal Design for Learning Theory

Kim (2021) drew on the universal design for learning theories in his explanation of the theoretical background of his study about a gamified mobile social learning platform. It is a

theory by Rose and Meyer (2002) that proposed that gamification needs to consider three components to provide the best experience for learners. Namely, a diverse presentation of content, mastery through a multitude of activities, and multilinear learning paths.

Kolb's Experimental Learning Cycle

The main idea of the Experiential Learning Cycle by Kolb and Kolb (2005) is that learning is a process of building knowledge in the form of a cycle. It involves a creative tension between four learning modes. De Oliveira and colleagues (2019) used it to explain the role of the student in the learning process. They focused on learning through personal experience and how the student could select the most relevant information from this perspective. Further, the gamified training module "Healthy Living" was developed under the consideration of Bloom's Taxonomy, a framework for defining learning objectives in conjunction with the ADDIE model (a generic model for instructional design) to achieve a structured online learning course.

The study by Cechella and colleagues (2021) also reflects on the interactive role by which the content is provided to learners. They reason that trainees use the learning-by-doing mode when they develop KSA which is aligned with the theory of experiential learning (Kolb & Kolb, 2005). Similarly, Instructional Design comes up as a way to integrate gamification effectively with a structured learning environment. Specifically, they argue that learning theories only explain individual learning processes while instructional theories account for how individual differences interact with instruction and context to create learning outcomes (Reigeluth & Carr-Chellman, 2009). Hence, they draw on both types of theories to create an effective intervention.

Social Cognitive Theory

Similar to Kolb's Learning Cycle (2005), the Social Cognitive Theory by Bandura (1977) postulates that participants learn and imitate one another through a process called vicarious learning. This captures teamwork, social interactions, and communication. The study by Lai and colleagues (2021) used this theory as an explanation for the reported experiences of increased collaboration and acquaintance of doctors in the free answer questionnaire after conducting their gamified training intervention.

Self-Directed Learning Theory

Thongmak (2021) drew on the Self-Directed Learning Theory (Merriam, 2001) which postulates that learners are responsible for initiating and guiding their learning process, which is an important concept of their variable lifelong learning intention.

The three aforementioned theories all emphasize the active role of the learner in a social context. Learning is not simply an act of passive knowledge consumption but an active act of exploration in touch with contextual factors in the learning environment and the structure of the learning material. To integrate many of these complex parts, some of the articles draw on more complicated frameworks and multilayered theories to help create and structure effective gamified interventions in job training.

Gamification Taxonomies and Guidelines

Only a quarter of the investigated studies ($n = 4$) directly discussed gamification taxonomies and guidelines. This finding might support the assumption that the theoretical framework of gamification is yet to be established. Next to the two design theories (6 D's of Gamification and meaningful design strategy as well as the gamification taxonomy as well as the 5 Design Elements were mentioned.

6 D's of Gamification. Starting with Frameworks of Gamification, one of the most prominent is the 6 D's of Gamification by Werbach and Hunter (2012). They postulate 6 phases for a good gamification implementation, that goes beyond gamification itself and also consider the broader context such as business objectives and deriving desirable behaviors. Santos and colleagues (2022) draw from this framework in their exploratory study aimed at systemizing information in the gamification of job training.

Meaningful Gamification Strategy. Kim (2021) focuses on the antecedents of flow in his research on continuant usage intention. For his gamified Mobile Social Learning Platform, he used the meaningful gamification strategy which builds on the ground of intrinsic and extrinsic motivation theory (Ryan & Deci, 2000).

5 Design Elements by Deterding. The 5 Design Elements by Deterding (2011) employed by Newcomb and colleagues (2019) in their study of a gamified development system for direct care staff is more focused on gamification itself and neglects the broader framework. It is a classification system that is mainly concerned with the game's interactive elements and mechanics of the game, design principles, and player experiences.

Taxonomy of Gamification. Dincelli and Chengalur-Smith (2020) use the taxonomy of game elements by Liu and colleagues (2017) for their gamified security training intervention. This taxonomy is concerned with 2 broad categories: gamification objects and mechanics. Objects are used to create sensory experiences or cognitive experiences and mechanics are the rules that govern the interactions between users and game objects (Teh et al., 2013). In Newcomb and colleagues (2019) study, this taxonomy is embedded in a bigger design science research (DSR) process which we will turn to next.

Theoretical Frameworks in Gamification Research

The remaining articles do not cite specific theories but refer more to broader frameworks on which they based their studies. These frameworks are characterized by combining multiple existing theories and often incorporate both motivational and learning aspects. There is a need to distinguish between specific gamification frameworks which often focus specifically on the application of game elements and broader design frameworks that integrate gamification into the instructional context.

Design Frameworks

Next to the specific gamification theories, there are also more general design frameworks being used in the literature. These refer to multidisciplinary frameworks that aid researchers in the development of effective interventions in organizational training. Out of the 16 studies, six studies explicitly used design frameworks when creating gamified interventions.

DSR Framework. Design Science Research is a newly developed multidisciplinary research brand that seeks to generate prescriptive knowledge about the design of information system artifacts like software, methods, and concepts (Hevner et al., 2004). This framework was applied by both studies looking at the gamification of security training and awareness artefacts (SETA) (Dincelli & Chengalur-Smith, 2020; Silic & Lowry, 2020).

Silic and Lowry (2020) chose the DSR approach advocated by Nunamaker et al. (1990) which describes four steps. Theory building, systems development, experimentation, and observations. Further, they establish two design principles for their intervention. First, the gamified training system should incorporate different design elements that increase employees'

motivation and fulfillment. Second, the gamified training system should provide new knowledge through a learning process that is meaningful, entertaining, and fun.

Dincelli and Chengalur-Smith (2020) focused on different design elements for their gamified security training regarding online self-disclosure (OSD). Their first design principle, the story-based agent, advocates for the use of agents as part of the story-based content to help guide users through the learning process. Next, the principle of reflection implies that games should provide opportunities for the users to stop and think. In the context of learning, gamification must focus on providing feedback about the user's learning progress (Cheong et al., 2014), performance, and competence (Deci & Ryan, 2000).

Models of Instructional Design

Instructional Design is defined as the systematic development of procedures, based on learning and instructional theory, that aim to facilitate instruction (Ozcinar, 2009). In the following section, an array of different instructional design frameworks used to integrate gamification in a broader context will be presented.

4 Steps of Training by Salah. In Cechella et al.'s (2021) study which investigated gamified training in bank managers, the authors drew on Salas 4 Steps of creating a training which consists of a training needs assessment, instructional design, and training execution and assessment.

ADDIE Model. Another common framework of instructional design is the ADDIE Model (Branch, 2009) which stands for Analysis, Design, Development, Implementation and Evaluation. De Oliveira and colleagues (2019) investigated the gamified training course "Healthy Living" whose creators used the ADDIE model to create an effective instructional

design for the program. Similarly, Miller and colleagues (2018) used ADDIE to gamify an IT Service Desk Training Program. The goal of this program was to increase employee retention and customer satisfaction. The evaluation of the training effectiveness the Kirkpatrick's evaluation framework (2005) was used. Investigating the first level of this framework through the attitudinal survey, the intervention was deemed successful, as it was useful and enjoyable for the employees as well as successful at engaging the new hires. However, on the third level of the Kirkpatrick evaluation framework (the customer service satisfaction survey) which indicated whether the trainees were able to apply the learned knowledge, the intervention was not successful, as there was a decrease in overall satisfaction after the implementation of space camp training. Hereafter, the authors questionably still concluded that the training was effective, based on the attitudinal questionnaire, regardless of the negative trend of their main quantitative research object.

Surface 3 Phases of Training. Kornevs and colleagues (2019) used 3 step training framework by Surface (2013) to develop the gamified training process for public servants. It is constituted by the three steps of needs identification, needs specification and training/evaluation.

Summary of Results: Theoretical Background

The analysis showed that motivational theories such as SDT and Flow seem to be widely accepted models, but when investigating learning theories, there is a lot more diversity of theories and frameworks employed. Yet, a common theme is the ToGL (Armstrong & Landers, 2017, Cechella et al., 2021, Nair & Matthew, 2021). It is the first learning theory trying to build a bridge between motivational and instructional aspects necessary for gamified learning. Furthermore, there is a positive development of design research frameworks starting to appear

more often in recent research on gamified job training studies (Cechella et al. 2021, Miller et al. 2018, Silic & Lowry, 2020) integrating gamification in the larger context of interventions.

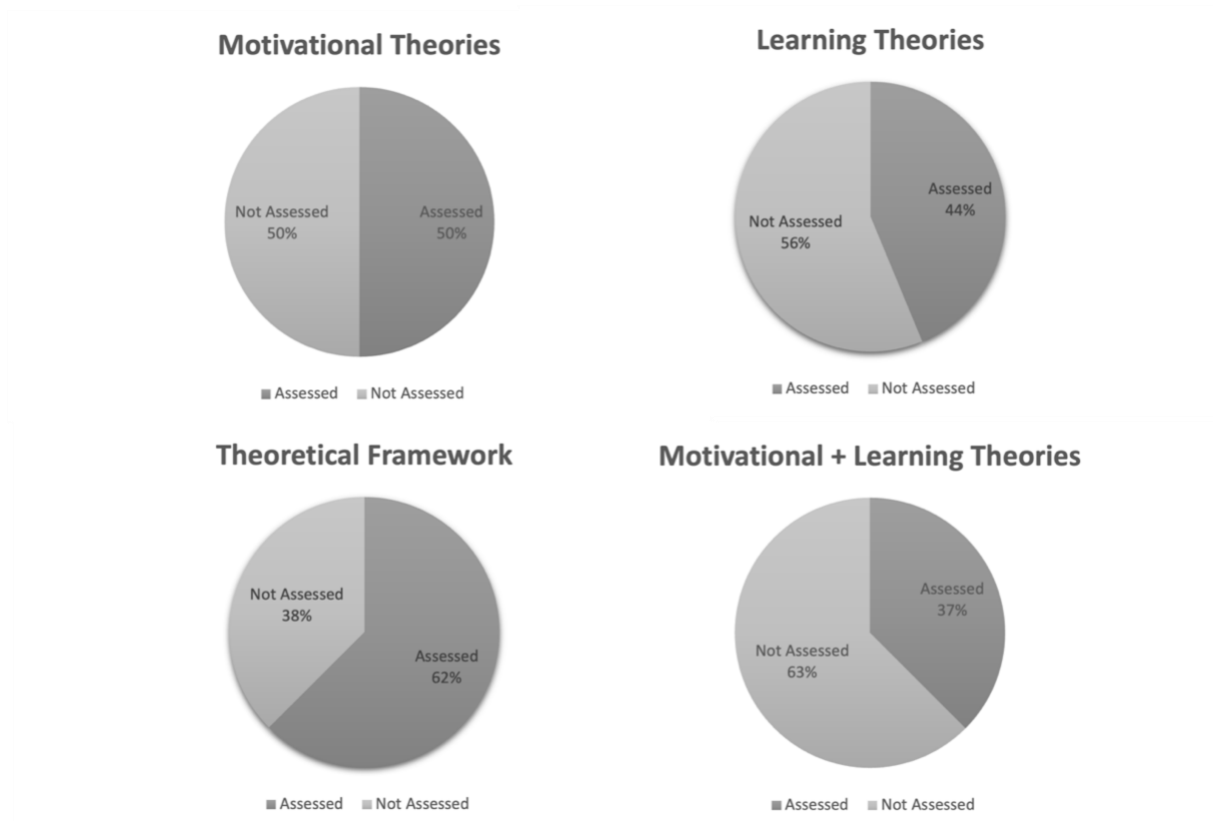
Table 3

Classification of Theoretical Background

Authors	Motivational Theories	Learning Theories	Frameworks/ Oth. Theories	Year
Armstrong et al.	TPB	ToGL	TETEM	2017
Baxter et al.	-	-	-	2017
Brull et al.	-	-	-	2017
Cechella et al.	-	Experimental Learning, ToGL	Instructional Design, 4 Steps by Salah	2021
De Oliveira et al.	TRA	Blooms Taxonomy, Experiential Learning	ADDIE Model, UTAUT	2019
Dincelli et al.	-	-	Taxonomy of Game Elements, DSR Approach	2020
Iacono et al.	SDT, Flow	-	Bartles Player Type, Game Element Hierarchy	2020
Kim	SDT, Flow	Universal Design for Learning Theory	Meaningful Gamification Strategy	2021
Kornevs et al.	-	-	3 Phases of Training by Surface	2019
Lai et al.	Flow	Social Cognitive Theory	-	2020

Miller et al	-	-	ADDIE Model Kirkpatrick Evaluation	2018
Nair and Mathew	SDT	ToGL	-	2021
Newcomb et al. Santos et al.	-	-	5 Design Elements 6 D's of Gamification	2019 2021
Silk & Lowry	HSMAM, Flow	-	DSR Approach	2020
Thongmak	SDT	Social Learning Theory	-	2021

Notes. TPB = Theory of Planned Behavior, ToGL = Theory of Gamified Learning, TETEM = Technology-Enhanced Training Effectiveness Model, TRA = Theory of Reasoned Action, UTAUT = Universal Theory of Acceptance and Use of Technology, SDT = Self-Determination Theory, HSMAM = Hedonic-Motivation System Adoption Model

Figure 2*Overview of Theoretical Background*

Note These graphs depict the percentage of studies that assessed either class of the established theoretical categories. Assessed means that at least one theory pertaining to the category is used to support the reasoning behind the gamification intervention of each study.

Outcomes of Gamified Interventions in Job Training

Psychological Outcomes

Looking at the psychological outcomes, 14 out of the 16 studies investigated different psychological outcomes of gamification in organizational training. This percentage suggests that the psychological aspect of gamification is already quite established in the literature.

Specifically, the concept of motivation and engagement is referenced in half of the articles. It is

closely followed by enjoyment, which is present in six out of 16 studies investigated this outcome. The last noteworthy category is presented by collaboration which was presented in three studies.

Engagement/Motivation

The most prominent finding of the literature on gamification in the job training context is the increase in engagement and motivation. Eight studies (50% of total articles) investigated this effect and all of them found significant increases in engagement/motivation in the gamified intervention. Most of these results originate from qualitative measurements, in this case field interviews (Brull et al., 2017; Dincelli et al., 2019; Miller et al., 2018, Newcomb et al., 2019) other studies employed questionnaires to quantitatively measure engagement and motivation (Lai et al., 2020; Nair et al., 2021; Silic & Lowry, 2020). This diverse set of measurements combined with the positive effects points to a solid effect.

Lai and colleagues (2021) observed that their participants felt more motivated in the gamified condition of their ultrasonographic training module by employing a gamification experience survey using a Likert scale. Moreover, participants felt that the gamified training was more enjoyable and made it easy to connect to their fellow peers. In their survey study investigating the effect of gamification and lifelong learning intentions (Thongmak, 2021), he found that gamification increases all three determinants of SDT which ultimately led to an increase in lifelong learning intentions. Nair and Matthew (2021) also reported a positive relationship between gamification and motivation. Their results show that their measures of valence and instrumentality were significantly increased in the gamified condition. Moreover, they found that participants reacted more positively towards the gamified module which included measures like enjoyment, reaction to technology, and relevance, leading them to conclude that

the gamified module results in higher learner motivation and ultimately job performance. In Newcomb's (2019) study of a gamified professional development system for direct care staff he found that there was an increase in engagement in the gamified condition, in addition to a positive valuation of the change in the system from supervisors. Baxter and colleagues (2017) likewise reported that the participants strongly preferred the gamified condition compared to the original training as they perceive it to be more enjoyable, fun, and interesting. In their efforts to gamify IT service desk training, Miller et al. (2018) qualitatively analyzed participants' responses to the gamified intervention. As previous studies indicated, participants perceived the gamified space camp training to be "engaging", "easy to follow" and "informative". Lastly, participants of the gamified training module for nursing orientation (Brull et al., 2017) similarly reported very positively about the gamification experience in the open part of the questionnaire. They noted how "engaging", "interactive" and "stimulating" the gamification experience was.

In conclusion, there is unanimous agreement across all studies that investigated the motivational aspect of gamification that gamification leads to significant increases in motivation and enjoyment of training. This effect was observed in different scenarios, ranging from nursing orientation to security desk training to gamifying procurement processes, and can therefore be described as context independent. This can be attributed to gamification eliciting autotelic experiences as explained by Flow Theory (Csikszentmihalyi, 1985) across different contexts.

Enjoyment

Enjoyment is closely linked to the aforementioned engagement part of gamified interventions. Similarly, out of the six studies that set out to investigate this effect, all of them concluded that the gamified intervention increased the perceived enjoyment of training

(Armstrong & Landers, 2017; Baxter et al., 2017; Dincelli & Chengalur-Smith, 2020; Lai et al., 2020; Miller et al., 2018; Newcomb et al., 2019)

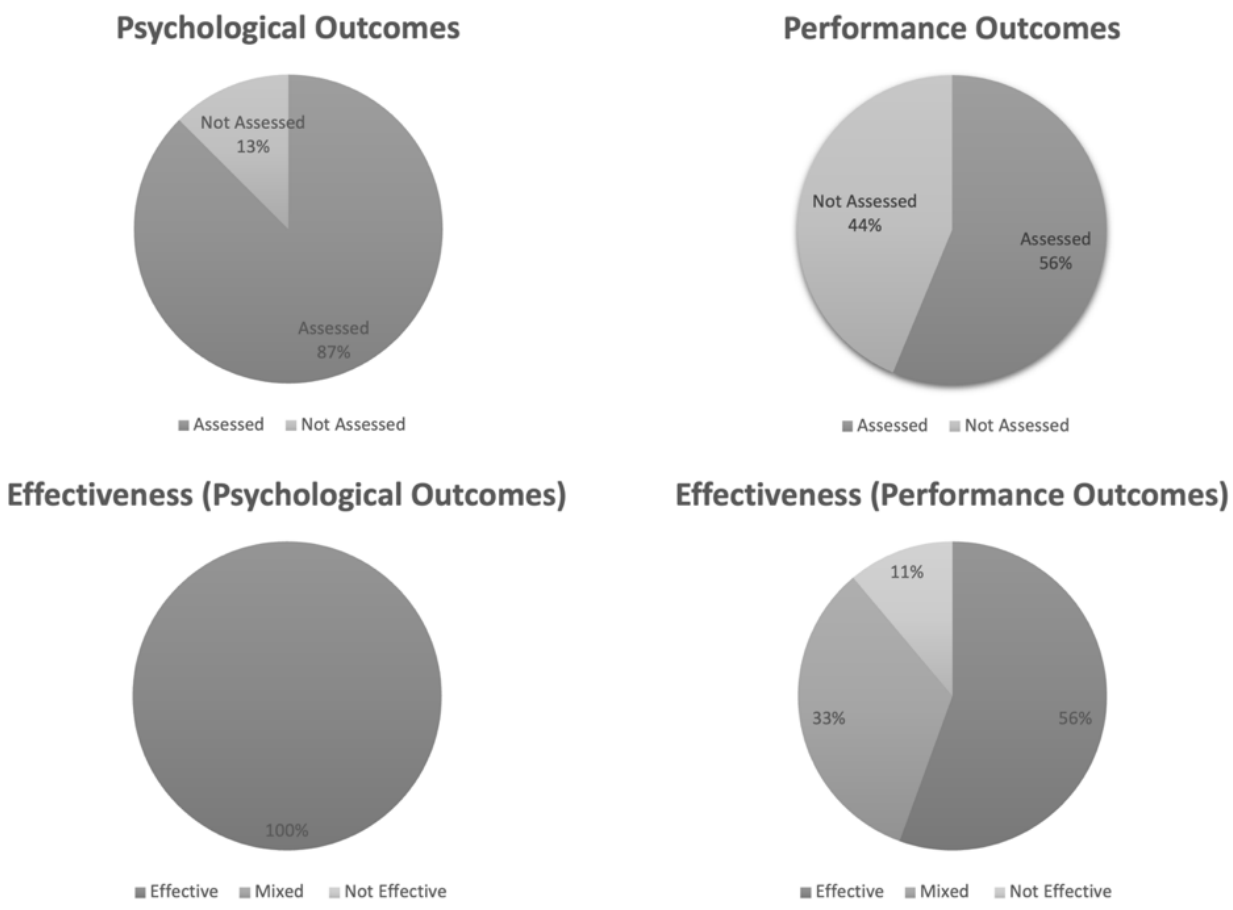
An interesting notion is situated in the study of SETA artifacts. Dincelli and Chengalur-Smith (2020) noted that out of their two gamified conditions, the visual-based intervention (compared to the text-based intervention) scored significantly higher, leading them to conclude that there might be associated benefits in presenting training visually to increase engagement.

Collaboration and Teamwork

Another notable theme that emerged from the research was the increased collaboration between team members resulting from higher interactivity of some team-based interventions. In their study of gamifying ultrasonographic treatment, Lai, and colleagues (2020) observed that participants felt that they could better acquaint themselves with their colleagues. They noted that especially in the clinical context the traits of teamwork and effective communication are indispensable for an effective operation.

Similarly, Miller and colleagues (2018) noted that the gamified training module was effective in the pursuit of encouraging participants to build a community of peers through the means of mentoring and team interaction. These results point toward the positive effects of gamification of increasing communication and collaboration between peers. This might be a result of the team-based interventions and hence intensified interactions between team members that are common in gamified training.

Figure 3
Outcomes & Effectiveness of Gamified Interventions



Notes. These graphs depict the frequency of the different types of outcomes that have been assessed by the studies. Further, effectiveness aims to show if the outcomes are reported unanimously or if there is mixed evidence in the literature. Effective means that a significant p-value (<0.05) has been observed.

Performance Outcomes

Performance outcomes are split into knowledge-based outcomes and skill/behavior-based outcomes. In contrast to the stark positive outcomes observed in the literature, the nature of performance outcomes is more ambiguous. Knowledge retention has been the focus of most papers, amounting to 6 studies that discussed this concept. Conversely, higher cognitive functions were only discussed in one study (Cechella et al., 2021) suggesting that there is some conceptual work to be done. Moreover, procedural knowledge was assessed in four out of the 16 studies while cognitive attitude was assessed in two studies.

Knowledge Retention & Memory

In their study of ultrasonographic training, Lai et al. (2020) found no significant difference between the post-test scores of the gamified intervention and the regular training. They stated that the gamified intervention group did not significantly outperform the control group in terms of knowledge acquisition. One possible explanation for that might be that the two conditions were together in lectures and pre-assessment skills training sessions, which could have obscured the effect.

Armstrong and Landers (2017) reported that there was no effect of declarative knowledge between the two conditions and even a negative effect on procedural knowledge. Suggesting that if at all, gamification had a negative effect on knowledge retention. It is noteworthy that the knowledge measures were low in internal consistency reliability (due to heterogeneity of content), possibly serving as an explanation for the observed effects.

Miller and colleagues (2018) reported an increase in the fields of response time, problem-solving and professional staff in the customer experience survey after the gamified intervention. This can be thought of as indirectly relating to both procedural knowledge (response time,

problem-solving) and knowledge retention (knowledgeable staff). However, their main variable of increased overall customer satisfaction dropped 9 percent compared to the year before.

Suggesting that the gamified experience might not have been successful in achieving this goal.

They rationalize this negative effect due to contextual variables such as the overall changes to the IT department over the year which might have impacted overall satisfaction levels. Still, they conclude that the gamification strategy positively affected the IT-Desk employees.

The study investigating gamified orientation training for nurses (Brull et al., 2017) found that the gamification orientation group had the highest scores for all measures (total index, pain-, wound-, fall management) compared to the didactic and online module groups. Hence, they conclude that gamification was effective in increasing knowledge retention.

Baxter and colleagues (2017) continue the small but significant learning improvements of the gamified group compared to the control group. Moreover, they observed a small interaction effect between learning outcomes and the experience of employees, leading them to conclude that gamification might provide greater learning for less-experienced employees. A possible explanation is the increased motivation of new employees and a better affinity to technology.

The gamified SETA training (Dincelli & Chengalur-Smith, 2020) also reported positive effects on memorability for both gamified intervention groups (visual vs text-based). They classified memorability as consisting of recall, recognition, and redintegration. They found that both conditions increased significantly compared to the control group. Additionally, the visual-based intervention group scored higher than the text-based group which can be explained by the number of meaningful associations triggered by visual stimuli.

Higher Cognitive Functions. The only study, that did not assess learning outcomes by simple measures of knowledge retention was Cechella et. al (2021) investigating gamification in bank manager training. They looked at higher cognitive functions, namely synthesis and analysis, and assessed those via open-ended questions about real-world problems. The scores of the gamification group were higher compared to the control condition but did not reach statistical significance ($p = .27$). It is important to note, that this study is the only one that assessed knowledge performance outcomes with higher cognitive predictors of synthesis and analysis compared to simple knowledge retention. As learning is not only constituted of passive knowledge recall, there is a strong need for further investigation and operationalization of the concept of learning when assessed in the context of gamification.

Skill Learning and Procedural Knowledge

In terms of skill learning and procedural knowledge, the literature also shows mixed effects. As established, Armstrong and Landers (2017) found a negative effect on procedural knowledge in their study. Silic and Lowry (2020) however found that learning, efficacy, and behaviors were all significantly increased in the gamified condition. Their study employed a rigorous DSR framework and tested the effects of gamification longitudinally. Additionally, they measured the effects of the security training by a behavioral test that they issued via a third party. Employees received phishing emails in their inboxes. The click-through rates were then measured, and the gamified condition significantly outperformed the control condition. Unfortunately, this is one of the very few studies that assessed actual skills after their training interventions instead of pure knowledge scores.

Cognitive Attitude

The gamified SETA artifact study (Dincelli & Chengalur-Smith, 2020) also investigated the effects on cognitive attitude and behavioral intention. In the short-term analysis, they found that the gamified interventions were significantly better than the control group at reducing online self-disclosure as well as changing intentions to disclose, behavioral attitudes, and cognitive attitudes. These effects combined show that gamification applied within the right framework can have a powerful effect on learning, behavior, and attitudes.

Table 4

Classification of Outcomes & Effectiveness

Authors	Psychological Outcomes	Performance Outcomes	Gamification Effective?	Direction of Effect
Armstrong et al.	Enjoyment	Decl. & Proced. Knowledge	Yes	Mixed
Baxter et al.	Satisfaction, Enjoyment	Knowledge	Yes	Positive
Brull et al.	Engaging, Interactive, Stimulating	Knowledge Retention	Yes	Positive
Cechella et al.	-	Analysis & Synthesis	Not Sign.	Positive
De Oliveira et al.	Performance & Effort exp., Facilitating cond.	-	Not Appl.	Positive
Dincelli et al.	Enjoyment, Usability, Ease of Learning	Memory, Cog. Att., ISD	Yes	Positive
Iacono et al.	-	-	Not Appl.	-
Kim	Flow, CUI	-	Yes	Positive
Kornevs et al.	-	-	Yes	Positive
Lai et al.	Engagement, Collaboration, Enjoyment	Knowledge Ret., Skill Learning	Yes	Positive

Miller et al	Engagement, Easy to Follow, Collaboration	Ind. Measured	Yes	Positive
Nair and Mathew	Motivation, Enjoyment, RtT	Learning performance	Yes	Positive
Newcomb et al.	Engagement, Elective Participation	-	Yes	Positive
Santos et al.	Engagement, Lucidity, Collaboration	-	Yes	Positive
Silk & Lowry	Appropriate challenge, Motivation, Experience	Learning, Efficacy, Behavior	Yes	Positive
Thongmak	LLL	-	Yes	Positive

Note. RtT = Reaction to Technology, LLL = Lifelong Learning Intentions, CUI = Continued Use Intentions

Discussion

This systematic literature review set out to explore the underlying theoretical framework of gamified training organizations as well as the outcomes of these interventions. Moreover, a critical view on the effectiveness of gamified interventions was provided. A discussion of the findings will be presented in chronological order.

There are a couple of important patterns emerging from this review of the literature. When examining the theoretical background, there is a great disparity between motivational and learning theories in terms of consensus among the scientific community. Looking at motivational theories there are a couple of relatively stable theories that seem to be widely accepted in research (SDT, Flow Theory). The associated psychological outcomes support the solid foundation. All of the studies that incorporated these theories reported significant results for outcomes such as engagement, motivation, and enjoyment.

Conversely, learning theories that try to link gamification to performance outcomes such as declarative knowledge are sparse at best. Only the Theory of Gamified Learning (Landers, 2015) explains this effect by using motivation as a mediator in this relationship. This theory however is generally applied in the educational context, so far there is no theory that proposes an explanation the relationship between gamification and performance outcomes in organizational training. This lack of theoretical background in conjunction with poor ecological validity might account for the diverse findings across the studies.

Apparently, most theories are largely focused at explaining the motivational aspects of gamification, this is why broader theoretical frameworks with multilevel theories are starting to emerge in more recent literature, combining classical motivation theory used in gamification with instructional design out of the training and design field. When comparing different frameworks, an evident structure becomes clear. They all incorporate an element of identifying and assessing the learning goals and needs. Next to the development of the intervention and finally, an evaluation phase will be employed to adjust the proposed intervention. It is important to stress the iterative nature of this approach. In contrast to the mere application of theories to a one-time intervention, both motivational and learning theories are implicitly incorporated into the broader context of DSR processes.

Looking at the effectiveness of gamified interventions, the studies incorporating a thorough longitudinal DSR framework all show great results spanning psychological and performance outcomes (Dincelli & Chengalur Smith, 2020, Silic & Lowry, 2020), further suggesting that gamification alone does not seem to be sufficient to singlehandedly increase performance outcomes but rather that it might have a positive interactive effect when combined with a suitable instructional framework.

The results of outcomes of the gamified interventions were varied. In terms of psychological outcomes, there is a consensus that gamification increases psychological outcomes, ranging from enjoyment to motivation. Each of the studies that looked at psychological outcomes found significant results (Table 4). On the other hand, mixed results were observed for performance outcomes. The different studies found positive, negative, and null results for the effect of gamification on job training performance outcomes. The study of Lai et al., (2020) did not find a significant effect in declarative knowledge between the conditions, this might be due to the identical learning content that both groups received together. Only the interaction with this content had been gamified, suggesting that the actual instructional content and structure of presentation plays an important role in the effect on declarative knowledge. Also, there might be the possibility that gamification just is not causally related to direct increases in performance outcomes. The Study done by Armstrong et al. (2017) even found negative effects in terms of procedural knowledge, while declarative knowledge scores were not significant, however it has to be noted that the knowledge measures had low internal consistency, due to the heterogeneity of the content which could be an explanation for this negative effect.

In more general terms, some reasons for these varied outcomes were the various instructional strategies and learning contents that were being used. Next to that, the diverse organizational target groups might have different predispositions that interact with how they react to gamified training (i.e., a younger generation of computer specialists being more adept at using technology than an older generation of nurses). Without an overarching methodological framework, it is quite difficult to single out the effect of gamification on performance outcomes.

The analysis of the literature shows, that gamification is an effective tool for increasing psychological outcomes. SDT and flow studies point to gamification as being effective to

increase the motivational aspect required for intentions to use job training systems and courses but there is mixed evidence that gamification can directly influence performance outcomes. Performance outcomes seem to be dependent on the design and content of good educational content. Currently, there is an argument to be made that gamification only indirectly influences performance outcomes via increased motivation, as the ToGL (Landers, 2014) proposed. This leads to the conclusion that gamification needs to be used in conjunction with design frameworks as well as good learning content to effectively increase both types of outcomes. As Cechella and colleagues (2020) remarked, “when designing gamified solutions for learning, [it is paramount] to identify and write learning objectives according to learning taxonomies” (p. 8).

In essence, we conclude, that gamification is not the “silver bullet” (Baxter et al., 2017) that uniformly increases the psychological and performance outcomes of training objectives outright. However, there are undeniable benefits to the thoughtful application of gamification in organizational training, of greater enjoyment while simultaneously maintaining learning outcomes. Hence, gamification can be recommended as a tool to increase the efficacy of organizational training by positively influencing the engagement of employees. Especially in settings not feasible for external rewards such as financial benefits, gamification can pose a promising way to promote employees’ intrinsic motivation.

Limitations

While this systematic literature review contributes to the field of gamification research in the organizational space, it is not without its limitations. First of all, the literature review can only provide momentary overview of the current studies at a certain moment of time. This is why it should be continually updated with new and emerging research, especially in a thriving field like gamification. Next, the final sample size amounted to only 16 articles for this review due to

the high inclusion criteria. In connection with the nature of the studies that are to a considerable degree of exploratory nature, this means that the actual power of the conclusions drawn from this review is relatively modest. Finally, the lack of a standardized instructional framework for the training interventions and the different organizational settings of the studies makes it difficult to generalize the observed effects.

Future Research Direction

The review of the current literature identified a couple of problems with the current state of the art of gamification research. First of all, this study discerned a diverse use of different theories and multidisciplinary approaches across the different studies, making it difficult to draw any generalizable effects of the gamified intervention. This is why there is a call for better theoretical integration of gamification in the organizational context (Mora et al., 2015, Suh et al., 2018). This review identified DSR approaches that are being used in conjunction with classical gamification theories as a promising way to apply gamification in the job training context. Still, future research should be directed to the unification of the theoretical framework of gamification and come up with a more universal framework specifically tailored to applying gamified interventions in organizational training.

In the same vein, it is important to agree upon a common instructional framework in order to provide a uniform basis when assessing the effectiveness of gamification, especially in terms of performance outcomes. Moreover, it is important to create a universal definition of learning with a solid theoretical foundation and testable constructs, that go above and beyond the current state of mere knowledge retention, as this is deficient as a complete measurement for the concept of learning outcomes (Cechella et al., 2021).

Lastly, future studies should adopt a longitudinal framework for studying gamified interventions. Learning is a process that occurs over time, rather than being a one-time effect. Hence, it is important to investigate the effects of gamification in organizational training on longer-term projects.

Conclusion

This literature review of underlying theories and the classification of outcomes of gamification in the job training context established a strong base for the effects of gamification on psychological outcomes in terms of motivation, enjoyment, and collaboration. Concerning performance outcomes, the current literature is more ambiguous which is why future research is needed to establish if gamification directly influences performance outcomes. Possibly it could be mediated by the implementation or type of instructional framework being implemented in the creation of a gamified training regimen. Similarly, there is agreement about the mechanisms that explain the motivational aspects of gamification in organizational training by the means of Self-Determination Theory and Flow Theory. On the other hand, learning theories are still spread out in the literature, which suggests that there is a need for practitioners to draw on learning theories when developing gamified training. In conclusion, it can be said that gamification is an effective tool for increasing the motivation within organizational training. In conjunction with an extensive instructional framework, it is a great tool to increase the effectiveness of learning interventions.

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