A Design for Gamified On-the-job Training

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Abstract—The primary purpose of this article is to present a framework for creating gamified on-the-job training. In doing so, this paper reviews factors that impact employee motivation in on-the-job training and the extent to which game mechanics can be used to increase motivation and expected learning outcomes. The chosen topic stems from a lack of academic literature on gamification in the work environment—specifically on-the-job training. Conversely, there is a well-established need to improve user motivation in participating in such training programmes. This paper introduces the JTF (Job Training Framework) model. The baseline theories applied for the framework include the flow theory, FODEM, and Octalysis framework in combination with various motivational theories, game mechanics, and studies on user types. The framework operates in the intersection of business ROI, user experience design, and behavioural science, which need to be considered when evaluating the framework. In this research, there was a series of interviews conducted to assess the framework model from a user perspective.

Keywords—gamification, gamified learning, on-the-job training, motivation

1 Introduction

A functional team of highly motivated and involved employees is key to a company's growth [8, 30]. One of the critical points for sustained growth is employee development [8, 30]. Based on findings from related studies, the author observed that employee development is generally lacking and inadequately considered by management in companies [8, 30]. The resulting problems for new employees are poor social integration, misalignment with organisational philosophies, and an inadequate understanding of the correct company procedures to adopt. Furthermore, consistent employee turnover is evidenced at a rate of a maximum of 50% within the first two years in various labour market sectors [8]. This adversely impacts company performance with observed losses in profit, client dissatisfaction, and penalties incurred due to human error [8, 30].

On-the-job training enhances human capital and, ultimately, improves the performance of an organisation [8]. The optimal outcome is contingent on selecting well-researched on-the-job training that is holistic, adaptable, and relevant to the employee [6, 21, 42]. Thus, a well-informed selection by management is crucial. Initial interest and engagement from the employees are critical for managed success and

company profitability. It is essential that management also directs focus on increasing employee engagement in the initial training process and improving workability in skills development, behavioural adaptation, and competence enhancements [8].

This paper emphasises the necessity of integrating business needs, behavioural science, and game design to create meaningful training to improve employee engagement and motivation. Game-based tools have been successful in educational contexts—providing support when developing comprehensible digital learning environments and engaging learning tools [1, 21–23, 28]. Gamification has increased in popularity since 2010 [28]. Considering this, we found it relevant for this research to apply gamification methods in the context of on-the-job training to define possible solutions for the problems identified. Improved user-level familiarity with a company's software and related job-specific applications will indirectly impact outcomes on a broader company level with error mitigation in working processes, decreased working hours, and increased productivity. With this, companies can use business return on investment (ROI) as a performance measure to evaluate the efficiency of the investment through reduced development costs, workload, and employee turnover rates. In addition, improved quality and productivity can be good indicators.

The integration of gamified educational methods with on-the-job training forms the basis of this research. This research aims to address the following research questions (RQ): (1) 'What factors impact employee motivation in on-the-job training?', (2) 'Could game mechanics increase employee motivation in on-the-job training?', (3) 'How could gamified tools influence employee thinking in terms of learning, including psychological barriers and problems that preclude successful on-the-job training?', and (4) 'Are there any limitations in the framework in terms of gamification sustainability?' This article will, thus, explore the factors that impact employee motivation in on-the-job training and how game mechanics can increase motivation. In doing so, this article will present a conceptual Job Training Framework (JTF) model for defining and analysing methods to apply when developing on-the-job training along with the psychological aspects to consider for customising content and adjusting the difficulty level for each user.

This paper will detail the theoretical basis for constructing a framework and highlight the key discussions in the existing literature on gamification, on-the-job training from a business perspective, as well as the main problems of e-learning materials and the recent research on the effectiveness of gamified training within the working environment in the Literature Review and Methodological Background sections. The Framework Description section will present the JTF model. In the Discussion section, the author discusses the JTF model's applicability from the perspective of Millennial users and highlights suitable game methods functional for job training. Finally, the Conclusion ties up the threads of the discussion and details a compilation of the outcomes derived with further research avenues in the field of gamification from behaviour science and UX design perspectives.

2 Literature review

2.1 Defining gamification

Gamification refers to a design approach of enhancing services and systems with affordances for experiences that are similar to those created by games [18, 21]. It incorporates the experience of enjoyment, flow, autonomy, mastery, and accomplishment induced by games and game-play [21] in other systems to optimise benefits [18] and adjust human behaviour [4, 29]. Overall, gamification applies game elements in non-gaming contexts [9, 10, 17] to derive game-based solutions [28]. The concept has become increasingly popular in business and academia since it emerged in 2010 [28]. This paper reviews gamification in the context of on-the-job training, considering the adoption of gamified tools in learning and training processes, along with their influences on social and business environments.

The potential of gamification lies in restructuring tasks and activities with game elements and gameful affordances [21], well-informed motivational support, and invoking flow experiences. Thus, it may be reached by breaking down activities into subtasks with clear goals and, subsequently, providing direct feedback for accomplishments [25], reframing an activity by establishing a meaningful narrative or gathering a social community to provide support [21]. On the other hand, in ref. [6], the idea of analysing game mechanics through the lens of games is introduced to understand how to combine different game mechanics and techniques to form desired and joyful experiences for everyone.

According to ref. [22], the success of any gamification is contingent on the pre-existing instructional content being adequately effective. The goal of gamification should not be to replace instruction but to improve it instead. If the educational content does not already provide users with the desired learning level, the gamification of that content will not independently facilitate learning. Thus, to increase the efficacy of this approach, there must be effective instructional methods already used for assignments; otherwise, users will be motivated to increase their participation in irrelevant learning tasks [22].

Figure 1 represents the theory of gamified learning. D -> C -> B and A -> C -> B are mediating processes. The influence of C on A -> B is a moderating process. Directional arrows indicate theorised path of causality [22].

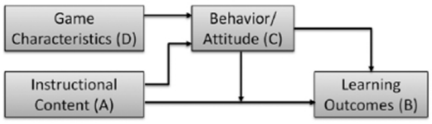

Fig. 1. Theory of gamified learning [22]

We assume that the same notion can be applied to the gamified training environment as it classifies as a "serious game"—i.e. "a game in which education (in its various forms) is the primary goal, rather than entertainment" [26, 34]. Therefore, gamification could serve as a motivational toolkit for engaging users in specific targeted training, where the initial training content prescribed provides an effective instructional method. Conversely, none of the gamifying elements would change the level of perceived learning in circumstances where the course material was inadequate. For this research, we presume that the learning methods and materials used are relevant and effective—as there was no focus on the analysis of course content and instructional design.

2.2 Game methods

In ref. [21] the authors conducted a study to analyse the psychological and behavioural outcomes of gamification, as well as the most frequently applied game mechanics. They reviewed 273 papers and identified 47 different affordances—which they organised into five type-based subgroups [21]. These affordances, and corresponding game mechanics, were categorised as follows: 1) progression-oriented—e.g., points, challenges, quests, badges; 2) social-oriented—e.g., social networking features, teams, competition; 3) immersion-oriented—virtual identity, narrative, a virtual world; 4) real-world related—e.g., real-world/financial reward, location data, motion tracking; and 5) miscellaneous—full game (also board games), virtual helpers, virtual currency [21]. The most commonly used game mechanics identified were various forms of points and scoring, challenges, clear goals, achievements, and leaderboards. In game design, points, achievements, and leaderboards are goal metrics that provide performance feedback to the player [40]. Their applicability to a diverse range of existing systems likely accounts for their popularity in gamified applications [21]. Though, in ref. [6], the analysis of game mechanics through the lens of games is introduced to understand the best way of combining different game mechanics and techniques to form desired and joyful experiences for everyone. Hence, the creation of the Octalysis framework comprised a significant range of game mechanics [6]. Eight core drives that motivate user interaction and promote desired behaviour within a game environment were incorporated to enhance the framework [6]. As a result, the Octalysis framework is an accessible and affordable toolkit for game designers and developers of any gamified environment. The framework has an extensive list of game mechanics that could be applied.

2.3 Researches related to the applications of gamification

In the current European Commission programme Horizon2020, which includes "Advanced Digital Gaming/Gamification Technologies" in a non-leisure context, we see the application of gamification in a socio-political context [11]. As highlighted in ref. [11], digital games can assist a range of excluded groups to integrate better into society. These techniques "show potential in addressing issues of policy concern, including wellness and ageing, education and employability of poor learners, improved quality of training and skill development in industry, and civic participation" [5]. Thus, evidencing the adaptability of gamification for use as an HR tool to achieve company objectives.

A literature review of empirical studies on gamification was conducted by ref. [15], and they subsequently presented their findings in a paper titled: "Does Gamification Work?" The majority of the studies reviewed (24) yielded positive effects from gamification. Some of the articles showed partially positive results and discussed the related shortcomings—for instance, the most extensive studies in the review reported that gamification might not be effective in a utilitarian service setting. However, engagement by gamification depends on several factors, including user motivation and the nature of the gamified system. In understanding the contextual factors, it is beneficial to consider the following theoretical perspectives: (1) the social environment: theory of planned behaviour states that the voluntariness of carrying out a task is one of the main antecedents for attitude formation and behaviour; (2) the nature of the system: whether the system in question is utilitarian or hedonic; and (3) whether the involvement of the user is cognitive or affective [15]. Accordingly, the JTF model functions as a link between motivational theories and game design. Motivational gamification methods were applied to develop this framework to optimise flow, enrich user experience, and address business needs. Experimental conditions could test the impact of the context of the gamified system. Thus, by implementing particular motivational affordances and holding them constant while varying the nature of the underlying service, we could get insight into how the context affects the outcomes of gamification. In some cases, the results of gamification could be short-term—having only a novelty effect for users. On the other hand, some studies indicate that the removal of gamification led to adverse consequences for engaged users—likely attributable to loss aversion from losing badges and points earned.

Unlike the attention, interest, desire, and action (AIDA) principle commonly used in marketing to attract and engage customers [13]; gamification processes enable a more direct way to adjust behaviour and, ultimately, promote consumer loyalty. This is because gamified applications establish a clear history of product usage [13]. Contrarily, in their research, ref. [15] highlights that, of the studies conducted, there were none in a marketing segment, even though gamification is often touted as a marketing strategy. Nonetheless, the dependent variables across the studies showed increased system and service quality acting as a significant marketing driver.

The empirical literature reviews in gamified education and learning conducted by ref. [23] indicate that most studies were related to the implemented affordances and psychological outcomes. The research results mainly reported positive feedback. However, there also were some mixed experiences and outcomes. These findings align with those of a study by ref. [21]. Among the most significant results reported in the controlled experimental quantitative studies identified [21] were the following: 1) while positive research findings are frequent (28.7% of the papers), a clear majority of the studies still report somewhat mixed results—i.e., the papers report negative or inconclusive results in addition to positive results; 2) nearly half (47.0% of the papers) report mixed, but mainly positive, results; 3) 2 out of 66 quantitative experimental studies reported entirely negative results. From their findings, ref. [23] suggested that future research in gamification solutions and study design focus on addressing user personality and demographic characteristics. These characteristics were integral in developing the JTF model. The research focus encompasses factors that precede the effects of gamification on human behaviour and motivation. These factors include user types, stages of mastery, multi-generational workforce, and various motivational theories.

Research on gaming motivations indicates that the motivators of user behaviour are diverse and include achievement-related methods, social aspects, and role play [21]. However, in ref. [21], the research further highlights that the theoretical and empirical issues of the overall gamification context are incomplete. Thus, the determinants behind gamification affordances are currently not well analysed.

3 Methodological background

Game design is a field that connects to both psychological and system thinking. As the user plays a leading role, their motivation drives the final result. Therefore, a company can build a successful gamification experience with knowledge of user motivations. Understanding user motivations is critical for a successful gamification experience for perceived learning. It was found in ref. [7] that using high degrees of skill in challenging tasks results in deep concentration, absorption or immersion – a phenomenon called flow. In their research, ref. [39] shows that during balanced activities, the flow experience has a psychologically positive effect on learning, as the individual becomes so immersed in the task that nothing outside distracts them. A user achieves flow when their skills directly correlate with their challenges—i.e., the challenge increases with an improvement in the user's skills [7, 25]. Similarly, improved skills encourage deeper user engagement; and subsequently increase perceived learning [7, 25]. Flow experiences commonly occur when the user applies a high degree of skill to meet a significant challenge [16, 34].

To extend previous studies, ref. [23] recommended that future research focus on user personality, demographic characteristics in gamification solutions, and study design. Accordingly, this section will delve into the various theories explored in this research related to user motivation based on 1) their needs, 2) player type, 3) stage of mastery, 4) the correlation of skills and challenges in a training environment, 5) the influence of age, and 6) level of loyalty to a company. The JTF model introduced in this article is a conceptual model personalised according to these aspects to help companies implement successful on-the-job training.

3.1 User needs

A successful gamification experience combines the desire and predictability of games to motivate an improvement in the life of a user. We discuss relative theoretical studies on user motivation to analyse this topic. This paper reviews game mechanics and their correlations to Maslow's needs hierarchy and will later reflect on various player types and stages of mastery.

In ref. [6], Maslow's needs pyramid [42] is modified to evolve the theory for a gamification context. The adjustment of the pyramid was the addition of a list of core drives that promote desired user behaviour within a gamified environment [6]. The eight core drives introduced are epic meaning and calling, development and accomplishment, the empowerment of creativity and feedback, ownership and possession, social influence and relatedness, scarcity and impatience, unpredictability and curiosity, and loss and avoidance [6]. A human-focused design—or gamification—increases human

motivation and behavioural optimisation [6]. This concept focuses on analysing the reason behind user participation in gamified experiences, as opposed to the main components of the game. It is proven in refs. [6, 20, 32, 33] that the core idea behind the game makes it exceptional and not the game elements. As such, it is the core drive which influences user behaviour rather than badges or points [6, 20, 32, 33].

3.2 Player types and stages of mastery

People are unique, each with their challenges and skill set. Therefore, to design a successful gamified experience, a company will apply general motivational rules with the necessary customisation to suit the user. Thus, better familiarity drives the user to a desirable result [42].

In his works, Richard Bartle [3] identifies and describes four player types [42], namely: 1) the Explorers who seek discovery and find reward in the journey, 2) the Achievers who focus on the status of achievement and collecting awards, 3) the Socialisers are the majority who enjoy interactive and collaborative game-play, and 4) the extremely competitive Killers who glorify winning and collecting trophies. Naturally, each player type has a different level of proficiency. In the late 1980s, Dreyfus performed research analysing the stages of mastery and found five core levels [42]. These stages are level 1: Novice—novel to the experience and no understanding of how to navigate it; level 2: Problem Solver—has enough knowledge to find solutions and lean on other sources; level 3: Expert—comfortable user and has familiarity with some intricacies; level 4: Master—experienced and knowledgeable, confident in their understanding and control of the process; and level 5: Visionary—proficient user keen on improving the system [42].

Among the various possible challenge combinations, only flow motivates the user to increase their level and elevate from novice to visionary [36]. The framework needs to consider the user player type and skill level to create a user-focused model for job training. Understanding these aspects will assist with customising the JTF model to suit user needs to effectively create the flow experience, optimise learning and enhance the user's gamified experience.

3.3 The multi-generational workforce

Currently, the workplace consists of four distinct generations that include the Silent Generation (born between 1928 and 1945), the Baby Boomer generation (born between 1946 and 1964), Generation X (born between 1965 and 1982), and the Millennial generation (born between 1983 and 2001) [27]. The saturation of Millennials will reach 75% by 2025 [27]. Psychologically and practically, there is a disparity in the motivations for attaining knowledge for employees across the generations [41]. The older generation, with extensive knowledge and work experience, is oriented more to the present and is selective with their resources, whereas younger employees are more future-focused and keen on growing their knowledge for professional development and increasing potential career opportunities [41]. It was observed in ref. [19] that older employees are often less engaged in education while approaching retirement.

In their article, ref. [19] shows the influence of factors such as supervisor support and recognition, schedule satisfaction, job clarity, career development, and promotion on employees. All these factors encourage employee motivation to various degrees depending on age [2, 31]. This research analyses on-the-job training that applies to employees across all demographics.

The JTF model emphasises the importance of flow experience as a design principle [7]. The Octalysis framework applies various user types and corresponding motivational theories as a toolkit with eight core drives for user motivation and related game mechanics [6]. However, for this research, they are combined in a meaningful way to support companies in meeting their goals for on-the-job training by applying game design aspects. This section highlighted literature related to gamification and its application. Additionally, the various motivational theories and game mechanics integrated to form the basis of the JTF model were analysed.

4 Framework description

The research method adopted for this study is constructive research. The study was undertaken in line with the requisites of design science research: building and evaluating an artefact [24]. The artefact developed is an experiential framework model—the JTF model—for creating on-the-job training. The construction of the artefact follows a movement from the initial state to the final state inherent to the design science research method.

One of the main challenges of designing on-the-job web-based training is the low level of user motivation and, consequently, the insufficient level of perceived learning. It has been evidenced in industry and literature that web-based training is used only as an information distributor without factoring user needs and feelings. In turn, user engagement and motivation to participate in the training environment are overlooked [1].

Each facet of the motivational theories provides a specific practical solution for the framework—forming ideas on the best way to improve implementation. The focus of the JTF model was not to produce one singular design solution. Instead, the framework primarily focuses on the user experience and addressing business needs to optimise ROI. User interface (UI) design is an exception that can be developed a step further and explored for future research. The JTF model extends beyond creating a fun and gameful experience and provides a business-focused solution to improving business goals and needs. The JTF model enables a decline in employee turnover and improved work quality, employee loyalty, and subgroup relations within an enterprise. The design of the framework focuses on the specific needs of a company. Therefore, while designing a user experience, the company should consider the business ROI as a performance measure to evaluate the efficiency of an investment. These three elements (business ROI, user experience design, and behavioural science) are defined to provide a clear picture of the sphere of influence for the framework introduced in this paper.

The development of the JTF model began with a review of the formative development method for digital learning environments in learning communities (FODEM) created by [37]. The FODEM concept provides a three-step process for creating digital learning tools and related environments, viz.: 1) needs analysis, 2) implementation, and 3) formative evaluation. The original assumption was that the structure of FODEM enables the development process and corresponding technical design environment. However, upon further investigation of FODEM, some limitations were identified in the model. We found that the needs analysis in step 1 is not adequately detailed and fails to consider a solution to enrich user motivation. Therefore, we focused on this phase to create a framework for users such as HR, business managers and other personnel responsible for successfully implementing training within the business environment to increase employee motivation and loyalty. Table 1 below provides an overview of the FODEM model.

Table 1. Summary of FODEM components

	NA	**I**	**FE**
Tasks	Identify the design solutions and main concepts.	Implement the design solutions fast to enable an early experiment with learners.	Evaluate the use of environment to find out viable features.
Methods	Analysis of contextual factors, learning theories and evaluation of the information received from other threads.	Fast prototyping	Use of environment, and experience analysis; content analysis.
Outcome	Pedagogical and technical design principles and solutions.	Environment that is usable in authentic learning settings.	Information about the features of the environment.
Risks	Incorporate the design ideas from different origins in a meaningful way.	Exposing too early to users.	Break the structure of the environment

In addition to FODEM, the PAT model [12] reviews the possibilities of experiencing flow when participating in a computer-based activity as well as what influences flow: the person, the task or the use of artefacts. The JTF model merges various concepts into a single figure to summarise the flow antecedents based on the PAT model, dimensions of flow, and its consequences. The result is improvements in learning [35] and exploratory behaviour [39], along with an acceptance of information technology [14] and perceived behavioural control. Therefore, all factors—person, task and artefact—should be analysed when developing software, a training programme or an educational application, as flow experience provides the balance between challenges and tasks. Good usability of an educational resource increases the value of flow and, correspondingly, the user's attention during the task. The best outcome is a perfect correlation between artefact, task and personal characteristics.

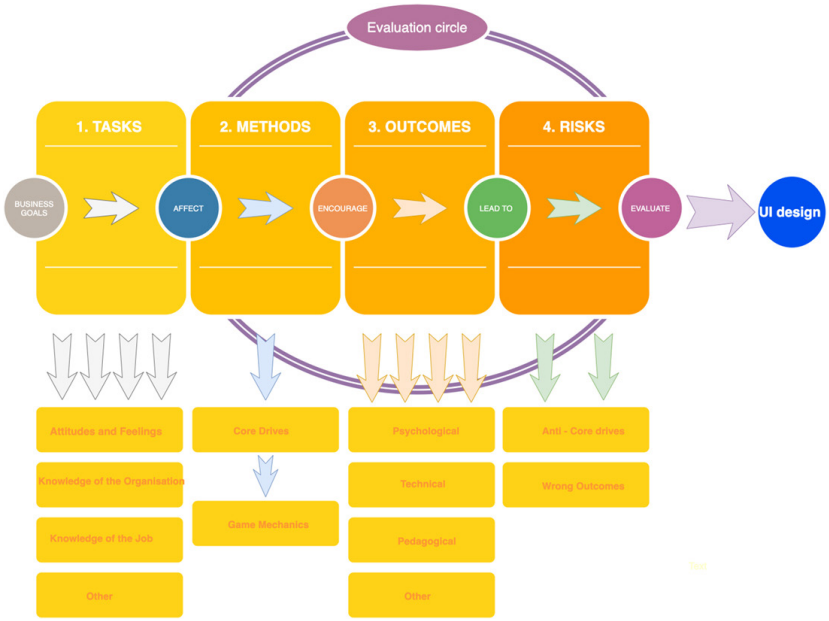

Fig. 2. JTF model for creating on-the-job training

In developing the JTF model (Figure 2), each facet of motivational theories, user types and stages of mastery are integrated with the FODEM, PAT and Octalysis framework models. The JTF model works as a link between motivational theories and game design. Moreover, the JTF model can be used to design and analyse gamified training. Though, companies should factor in several issues excluded in the framework when designing on-the-job training. In addition to the steps and benchmarks introduced in the framework, the company should also pay attention to the learning material, storyline, graphics, and sound along with various combinations of skills/challenges. The game should be usable—it must have clear goals and appropriate feedback to the user to facilitate the flow experience [20]. The author states in ref. [20] that applying conversational tools, rational tutorials, and computer-based tutors can facilitate the understanding of online learning environments. Only one solution yields results and gaming strengths are related to those schemata. One-sided activity may become tedious for the user and reduce motivation in the long run. The trick of a gameful experience is matching the user's skills with corresponding challenges to increase the likelihood of the flow experience. However, predicting the progression of user skills and appropriately matching them to similar challenges is always difficult. One solution is to design training personalised to the user's skill level. Alternatively, providing the employee with the option to choose a corresponding difficulty level is another solution. The focused attention implied in the form of game features aims to support reflective thinking and knowledge construction by focusing the player's attention on relevant information for learning. The training environment should help the user focus on relevant information, reduce excessive cognitive load, and increase the cognitive load necessary for knowledge construction [20].

As previously mentioned, the JTF model operates at the intersection of business ROI, user experience design, and behavioural science. Therefore, as a baseline for the JTF model, the initiator should provide business goals that management intends to reach. The first step aims to identify the goals and challenges within a training environment, including four types of tasks: 1) attitudes and feelings, 2) knowledge of the organisation, 3) knowledge of the job, and 4) other. Based on this input, the framework requires the user to fulfil steps 2–4. These steps are completed by adding corresponding core drives, game mechanics, identification of desired outcomes in the cross-sections of four characteristics—psychological, technical, pedagogical and other—and, finally, analysing possible subsequent risks, such as anti-core drives or incorrect outcomes. Keeping in mind the cyclical nature of the framework, the fourth step within the first evaluation round is not the end phase. The user must rectify all the results by returning to the methods mentioned in the Literature Review section to implement changes in the chosen gamified methods. Subsequently, in the evaluation round, the user may finalise the desired methods and assess the corresponding risks. The JTF model directs the user to the final stage of the process, which is a ready-to-use description for UI designers and programmers. Figure 2 depicts the above-mentioned steps with a simple colourful map that guides the user toward a desired result.

As discussed in the Methodological Background, it is necessary to identify a target group of users so their experience can be personalised accordingly. It is important to note that among all the theories, there is an extensive list of characteristics and segregations. Within possible company challenges and goals for training, we propose a list with four intersections corresponding to their background, viz.: 1) attitudes and feelings, 2) knowledge of the organisation, 3) knowledge of the job, and 4) other. The list provides an apparent structure that is easily adjustable for any enterprise depending on its needs. Based on the cumulative number of selected outcomes in step 3, the user has to identify which core drives are dominant and accordingly apply the relevant number of gamified methods targeting those specific goals.

To address the company's objective for on-the-job training, the evaluation of the JTF model demanded a thorough financial and business approach from a managerial perspective. An organisation must be geared to retain new employees. A good example is to focus on onboarding training. The onboarding process, including on-the-job training, is among the first experiences a new employee has with a company. On-the-job training could contribute to increased employee loyalty, reduce turnover and as a result, increase profit and other company gains. The analysis of these elements forms the foundation for an ingenious, competitive and holistic orientation training framework for new employees. Providing employees with effective onboarding training can be viewed as a great investment of a company's capital. The list below details the most obvious benefits of implementing gamified on-the-job training for company employees based on the JTF model. These benefits can be adjusted in line with the company's requirements and tailored to a business/departments' specific features: 1) reduced employee turnover rates; 2) increased employee loyalty; 3) increased production; 4) improved quality of work; 5) reduced human error; 6) reduced absenteeism; 7) improved subgroup relations; 8) improved customer service; 9) reduced onboarding time for new employees; and 10) improved workplace safety and ergonomics.

5 Discussion

As established, the JTF model aims to help businesses create on-the-job training to increase employee motivation and loyalty. The framework does not function to provide one solution for creating job training. Though, it will help companies ask relevant questions to adjust their needs and determine the possible and desired outcomes, the primary user type, and core drives for engagement and motivation. This also factors in the risks related to their solutions. When the user follows steps directed by the framework, they contribute essential data to creating a learning environment. Simultaneously, the user also learns about motivational theories, gamified systems and related outcomes. The JTF model, therefore, could be used more widely as a design principle in different business contexts. In this section, we will discuss the user's experience applying the proposed JTF model. The user perspective will provide insights regarding the usability and applicability of the framework in the business environment.

The author conducted a series of interviews to evaluate the JTF model based on user experience. A range of participants were interviewed, including university students, experienced employees, and mid-level managers with international work experience. The participants were Millennials and socialisers. The interviews served as an instrument to assess the usability and effectiveness of the framework for on-the-job training. The interviewees were presented with the framework model and, subsequently, asked the same set of open-ended questions. All the results were recorded, summarised and analysed for similarities and shared ideas.

The feedback from participants was a clear understanding of the purpose, goal, and outcomes of the framework. The participants deemed framework relevant for application in the work environment. Furthermore, they reported that the JTF model was user-friendly , its form, colour codes, links, and directions were understandable and easy to follow. This aligns with the assertion by ref. [20] that a game should be usable and provide clear goals and appropriate feedback to the user to facilitate the flow experience. Responses from the users indicated that most participants found the fourth step (Risk) to be the easiest based on their pre-existing knowledge of the subject, whereas the remaining few were more well-versed in the business goal and task creation steps. Conversely, the users all deemed the second step (Methods) the most challenging and, thus, should be integrated under the oversight of competent individuals in gamification, motivational theories, and user experience design. The participants' feedback corresponds with the findings from surveys by refs. [8, 38] and studies by refs. [5, 6, 21, 23].

When engaged further, all the users conveyed a preference for gamified training over e-learning materials in their learning environment. Moreover, they confirmed that gamified training would motivate an increase in loyalty to their employer. Their responses affirm the assumption that gamification should be introduced in on-the-job training to increase user motivation and engagement. To assess business ROI, we applied an impact study as a simple method to evaluate business goals and benefits. This method analyses the changes triggered by the training—i.e., business impact—such as staff retention, sales, or customer feedback. During this process relevant financial data regarding the organisation's operations is collected and used to measure the business impact. The company determines the inputs and indicators based on the

programme objectives. These can include use of knowledge or skills, completion of actions or tasks and the implementation of ideas. A cost/benefit analysis can be done by applying the standard ROI formula: the program benefits less the training costs divided by the training costs.

To achieve the aim of our research, we endeavoured to address the RQs proposed in the Introduction. These RQs were investigated through literature and accordingly addressed as detailed:

RQ.1: What factors impact employee motivation in on-the-job training?

The Introduction and Literature Review highlight factors that affect employee motivation and engagement in job training and the workplace [6–8, 15, 16, 19, 21, 23, 25, 30, 31, 41, 42].

RQ.2: Could game mechanics increase employee motivation in on-the-job training?

The Introduction highlights the success of game-based tools in educational contexts [1, 21–23, 28]. Subsequently, the Literature Review expands on the benefits of gamification for increasing employee motivation in on-the-job training. This section further discusses motivational theories and gamified learning, delving into how the flow experience and core drives can contribute to improved user motivation and engagement [4, 6, 7, 16, 18, 20, 21, 25, 26, 32–36].

RQ.3: How could gamified tools influence employees' thinking in terms of learning, including psychological barriers and problems that preclude successful on-the-job training?

The Introduction highlights the importance of well-researched, relevant, and adaptable training [6, 21, 42]. Furthermore, the concept of gamification along with game mechanics and related motivational theories are thoroughly discussed in the Literature Review [7, 21, 25, 26, 34]. The Literature Review also addresses the barriers to the successful implementation of job training [12, 16, 22, 26, 34, 36, 41].

RQ.4: Are there any limitations in the framework in terms of gamification sustainability?

As discussed in the Framework Description, gamification exists to improve instruction and not replace it. Therefore, the optimal efficacy of this approach is reliant on pre-existing instructional methods that are adequate and relevant. This prevents users from being subjected to increasing their participation in irrelevant learning tasks [22].

6 Conclusion

This article presents the JTF model—a framework for creating gamified on-the-job training. The JTF model was developed using motivational gamification methods to optimise flow, enrich user experience, and achieve business goals for optimal ROI. The targeted users for the framework include HR personnel, business managers, and those

responsible for successfully implementing job training. The JTF model aims to equip these users to increase employee motivation and loyalty within the business environment, though the successful adoption of gamified tools in learning and training processes is contingent on the use of effective instructional methods for training. Gamification serves as a solution to enhance existing training methods, not replace them.

The JTF model operates at the intersection of business ROI, user experience design, and behavioural science. In developing the framework model, various user types and corresponding motivational theories were applied in an Octalysis framework and meaningfully combined with FODEM, PAT, and other existing game models. The framework includes four key steps: 1) tasks, 2) methods, 3) outcomes, and 4) risks. The model can be used to design and analyse gamified training. It functions as a link between motivational theories and game design and does not provide the means to a whole game design process. In addition to the steps and benchmarks introduced in the framework, the company should consider aspects such as learning material, storyline, graphics, and sound, along with various combinations of skills/challenges in the path of flow that are excluded from the framework due to research scope limitations.

The intention of the JTF model was not to produce a specific design solution but to focus on motivational theories, business needs, and user experience—with the exception of UI design. UI can be further developed in future research. Several interviews were conducted to present the JTF model to users and get their perception of the applicability of the framework. All participants stated that they had a clear understanding of the meaning, goal, and outcomes of the framework and would recommend it for their working environment. They confirmed the findings established in literature [8, 30] that many companies give insufficient consideration to employee development. Consequently, new employees commonly face problems such as poor social integration, misalignment with organisational philosophies, and an inadequate understanding of company processes. Moreover, companies are challenged with high employee turnover rates that lead to adverse effects like reduced profits, client dissatisfaction, and penalties due to human error. In response to these challenges, a cost/benefit analysis using the standard ROI formula could be applied. This helps visualise the company's benefits and profits from effective gamified training that enhances human capital and improves the organisation's performance on a broader scale. Therefore, it is critical that companies implement job training that is well-researched, holistic, adaptable and relevant to the employee to achieve a successful outcome.

The increasing popularity of gamification in business and academia enables the continuous expansion of possible game mechanics. Therefore, this provides a baseline for more tools to expand training solutions. Technologies such as augmented reality could offer directions for gamified solutions extending beyond the diversity of experiences that game mechanics can currently afford.

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