Does Gamified Training Improve Task Engagement? Longitudinal Evidence from the Banking Industry

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Abstract
Gamification is a behavioral design technique currently used to promote behavioral change in diverse contexts, such as marketing and education. Companies implement gamification in the work environment with the promise of generating positive business outcomes. Transfer of training *is defined as the degree to which employees apply the knowledge, skills, and attitudes acquired in training in the workplace. Our aim in this study was to investigate the effects of gamification on the transfer of training through task engagement. The study's sample was 53 managers from a Brazilian bank, who were assigned to three experimental groups: gamified training, conventional training, and an untrained group. Secondary data were collected from the bank system, which covered a total period of 14 months (seven before and seven after the training). The data represented written feedback registered by the managers to the employees under their supervision, representing their engagement with this specific managerial task. The results indicate that the gamified and the conventional training produced a positive effect on the managers' task engagement in the first month after the intervention. Gamified training resulted in higher task engagement when compared to conventional training. The effect produced by training had already declined in the second month after training. The between-group comparison tests found no difference in task engagement between the three experimental groups. This research contributes to the academic literature by finding evidence that gamification is effective in promoting behavioral change in bank managers through gamified training. Also, our study innovates by performing an experiment in a business setting and analyzing longitudinal data. Future research should investigate whether gamification also affects the quality of performance in managerial tasks. Game elements that promote collaborative gamification must be tested together with competitive gamification to optimize the results obtained with the use of this behavioral design tool. Research on gamification in business settings should also aim at differentiating the gamification effects produced on employees and customers.*

Keywords
Gamification; business; banking; transfer of training; task engagement.

Introduction

Gamification is consolidating as a commercial and cultural success and has attracted researchers' and companies' attention (Koivisto & Hamari, 2019; Seaborn & Fels, 2015). Despite its popularization as a topic of interest in different fields, such as marketing and education, gamification is still a recent phenomenon as a study subject (Robson et al., 2015). In the business context, gamification is a behavioral design technique expected to generate higher engagement, positively impacting business outcomes (Cechella et al., 2021). One of the main objectives for using gamification in a business context is the promise of motivating individuals to perform activities with greater engagement (Dominguez et al., 2013; Pettit et al., 2015; Tan & Hew, 2016). The design and development of complete learning games are generally costly, which has opened space for the use of gamification as an active learning methodology with rapid implementation (Ibanez et al., 2014; Landers, 2014).

One of the organizational strategies to promote learning and behavioral change in employees is the use of the training and development (T&D) system. The T&D assessment stage is a process that includes data collection used for later decision-making and the tracking of learners' progress. At the individual level, the immediate results of the T&D system are the participants' opinions or satisfaction with the experience (reaction assessment) and their knowledge, skills, and attitudes (KSAs) improvement or acquisition (learning). The learning assessment can be designed and implemented in various ways to identify how much the individual's behavior has changed (Bontis et al., 2002). *Transfer of training* is defined as the effective application in the organizational work context of the KSAs acquired or developed during T&D experiences (Jaidev et al., 2012).

This study aimed to investigate gamification's effects on the transfer of training in the banking industry. We contribute to the scholarly literature by addressing the call for more empirical research in the corporate training environment (Larson, 2020) and through the use of a controlled experimental design (Hsu & Chen, 2018). This study's measures, using a longitudinal design, go beyond previous studies by measuring gamification's effects on task engagement in a bank context.

Theoretical framing

Gamification and learning outcomes

Previous research has revealed contradictions in gamification's impact on learning outcomes. Some studies, when assessing the application of practical concepts, affirm that gamification generates a better learning performance (Alcivar & Abad, 2016; Hamari et al., 2016). By contrast, other studies find that gamification does not yield positive results in terms of factual or conceptual learning, even in written assessments (De-Marcos et al., 2014; Dominguez et al., 2013). However, others have found positive effects associated with theoretical knowledge acquisition (Filsecker & Hickey, 2014; Ibanez et al., 2014). Accordingly, gamification needs to be integrated with complementarity learning tools (Buckley & Doyle, 2017; De-Marcos et al., 2016) rather than being introduced in isolation in the learning environment.

Although gamification is a tool to promote learning, it clearly needs further empirical exploration to determine its efficacy (Cechella et al., 2021). There is a need to assess the high-complexity cognitive levels (e.g., evaluation, synthesis, and analysis, according to learning taxonomies) because most available previous research measured learning using multiple-choice items or self-reporting instruments. This may be due to the designers' and scholars' difficulty in creating or accessing environments in which complex knowledge is developed (Attali & Arieli-Attali, 2015). Researchers are facing challenges, including the assessment of these cognitive levels, in developing instruments that are appropriate to what they are intended to measure (Landers & Landers, 2015; Tan & Hew, 2016). Scholars and business practitioners can take advantage of clarifying how gamification can influence workers' behavioral changes as measured with instruments that simulate work situations (Graafland et al., 2014).

Transfer of training

The training industry makes substantial investments to improve its employees' performance to obtain positive effects on organizational results. Organizations are not alone in having expectations regarding the training results in performance at work. Workers value feedback, opportunities to develop skills, and challenging tasks that contribute to satisfying personal ambitions while also contributing to the achievement of organizational goals (Noe et al., 2014). Training is the systematic acquisition of skills, rules, concepts, or attitudes that must result in performance improvement. The terms *instruction*, *course*, *event*, and *program* are used to refer to the learning environment. *Instructor*, *educator*, *learner*, and *participant* are used to refer to the individuals engaged in the teaching-learning process (Goldstein & Ford, 2002).

The degree to which the trainees apply the KSAs acquired in training in workplaces is a transfer of training definition provided by Wexley and Latham (1981). For acquired KSAs to be transferable, the training content must be learned and retained (Kirkpatrick, 1967). To summarize, the transfer of training definition stems from the existence of two conditions: (1) learning generalization for work (the extent to which the KSAs are applied in contexts, people, or situations different from those of the training) and (2) maintenance of trained skills (the extent to which changes resulting from a learning experience persist over time) (Baldwin & Ford, 1988; Blume et al., 2010).

Systematic literature reviews claim that the transfer of training construct is one of the oldest research topics in organizational and industrial psychology (Bell et al., 2017). Questions about the transfer of training remain relevant, and there is academic and organizational demand for more shreds of evidence that indicate the design and execution of effective training initiatives. There is a paradox in organizations because if, on the one hand, the results from training investments at the organizational level are viewed positively, the results from individual training events are still viewed with skepticism on the other hand (Baldwin et al., 2017).

Transfer of training questions has been the subject of several studies that explored the factors affecting organizational outcomes. Researchers seek to identify procedures to

increase the probability that KSAs will be applied in the most diverse contexts and tasks (Ford & Kraiger, 1995). Transfer measures can be taken immediately after training or after a certain period, and it is expected that the relationships are stronger the closer the measures are to the training experience, both in the physical and temporal context (Barnett & Ceci, 2002; Gautam & Basnet, 2020). Transfer of training has been measured as the amount of use of the KSAs trained and as the effectiveness of their application.

There is a longing for studies on instructional methods and strategies that explicitly target transfer of training, not just immediate learning, as a dependent variable (Yelon et al., 2014). Baldwin and Ford (1988) organized a model, widely adopted by scholars in the field, in which transfer of training is related to the following dimensions: characteristics of the trainees, training design, and work environment. Although the training design has received plenty of attention from researchers, there is still a lack of the fundamental element when it comes to instructional design and transfer of training: the relevance of the instructional objectives or training program goals concerning the explicit transfer. These objectives refer to the expected transfer of the training results, which should define the choice of assessment criteria (Blume et al., 2010). It is vital to use different designs for the initial learning processes (acquisition and retention) and the transfer of training, applying design elements that can effectively increase its outcomes (Ford et al., 2018). Concluding, it is crucial to optimize the transfer process, renewing research that investigates the principles of learning, now with an explicit focus on the transfer and not only on learning at the initial levels (Baldwin et al., 2017).

Methodology

Our sample comprised 53 bank managers divided (non-random assignment) into three groups: gamified training (N = 19), conventional training (N = 19), and the untrained control group (N = 15). To recruit for the training events, e-mails were sent to approximately 300 individuals, and the acceptance criterion was the first respondents indicating availability. The selected training is called the Performance Appraisal Course, a 16-hour classroom training conducted on two consecutive days in sessions of eight hours each. Two training events were delivered in sequence, first to a conventional training group (instructional design without gamification), which was 68.4% male and 31.6% female; the ages ranged from 28 to 61 years (M = 45.3, SD = 8.36). The second event was conducted with the gamified training group, using gamification in the instructional design. This training contained game elements, such as avatars, leaderboards, cards, and a points system. The quality of practical activities was assessed by the managers themselves, generating points and stimulating in-class competition. The gamified training group was 52.6% male and 47.4% female; the ages ranged from 31 to 60 years (M = 45.31, SD = 8.81). The control group was composed of untrained managers. This group was 46.7% male and 53.3% female; the ages ranged from 37 to 53 years (M = 45.60, SD = 5.35).

Measures

For the measure of the transfer of training, secondary data were collected from the financial institution where the study was conducted. The data were recorded by the managers themselves in the corporate system in text format and represent written feedback that managers are instructed to provide to their team's employees. Managers are encouraged and guided to register written feedback for employees under their supervision, although the task is not mandatory. In this study, we analyzed the managers' engagement with this specific task, measured by the number of written feedback reports registered by each manager to their subordinates. Data were collected from the feedback reports recorded over 14 months (seven before and seven after the intervention). The number of feedback reports registered by each participant needed to be divided by the number of subordinates in each team so that the measure of the dependent variable was adequate for comparison between and within the experimental groups; the greater the number of employees in the team, the greater the opportunity to register written feedback and engage in this activity learned in the training event. Our dependent variable is task engagement, calculated by the number of written feedback reports registered divided by the number of subordinates on the team at that moment.

Hypotheses and analysis procedures

Studies on gamification point out that this tool, when used properly, can produce higher engagement when compared to traditional learning methods (Filsecker & Hickey, 2014; Hamari et al., 2016; Ibanez et al., 2014; Khan et al., 2017). Studies also indicate gamification's beneficial impacts on employee engagement (Kumar & Raghavendran, 2015) and work engagement (Silic & Back, 2017). A systematic training system is known to be one of the more important organizational strategies to promote behavioral change (Bell et al., 2017), and it was expected that the conventional training would produce positive outcomes in the bank context investigated. Thus, we proposed the following hypotheses:

H1. Gamified training will positively impact task engagement.
H2. Conventional training will positively impact task engagement.
H3. Gamified training will produce higher task engagement than conventional training.

For the comparison within groups (H1 and H2), we applied the Friedman test using SPSS v. 25. This nonparametric test is adopted to determine whether there are any statistically significant differences between the distributions of three or more related groups. The groups are related as they contain the same cases (e.g., participants) in each group, and each group represents a repeated measurement of the same dependent variable. This test is also used if the assumption of normality is markedly violated, which is the case in this study. While the Friedman test allows determining whether there is an overall effect of the independent variable on the dependent variable, it does not indicate which of the groups differ from one another. To discover where any differences lie, it is necessary to do a post hoc test. This study aimed to investigate how the use of written feedback changed over time for the same

participants, comparing three or more time points. Between the time points, there was a training event for two of the three groups.

The comparison between groups (H3) aimed to determine whether the median of the number of feedback reports registered of at least one group was different from the median of another group in any of the seven months after the training. We used the Kruskal-Wallis H test on SPSS v. 25, a rank-based nonparametric test to determine whether there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable. A statistically significant (i.e., $p < .05$) Kruskal-Wallis H test indicates only that the median of at least one group is different from the median of another group. To discover which group(s) are different from which other groups, it is necessary to run a post hoc test. In the case of the Kruskal-Wallis H test, this is done and interpreted by pairwise comparisons using Dunn's (1964) procedure with the Bonferroni adjustment.

Results

The Friedman test showed no statistically significant differences for the untrained group: $\chi2(13) = 20.438$, $p = .085$. The test for the conventionally trained participants was significant, and the pairwise analysis revealed statistically significant differences with a Bonferroni correction for multiple comparisons ($\chi2[13] = 28.702$, $p = .007$) when statistical significance was accepted at the $p < .01$ level (H2 is accepted). The same procedure was done for the gamified training, and the results obtained after the correction showed statistically significant differences: $\chi2(13) = 47.412$, $p < .001$ (H1 is supported). Figure 1 shows the periods with the highest differences in the mean ranks (representing task engagement) for the gamified training.
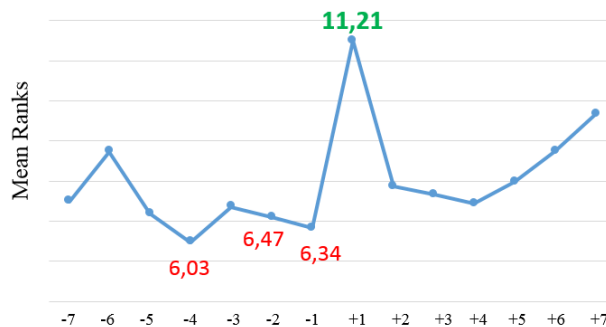

Figure 1. Task engagement - gamified training

No statistical differences were found when comparing the three experimental groups in the 14 months analyzed, so H3 is rejected. Despite this result, three aspects deserve attention: (1) the control group had a higher task engagement in the sixth month before the intervention; (2) both trained groups surpassed the untrained group in the first month after the intervention; and (3) in the second month after the intervention, all three groups already had similar task engagement scores. Figure 2 highlights the three moments mentioned above.
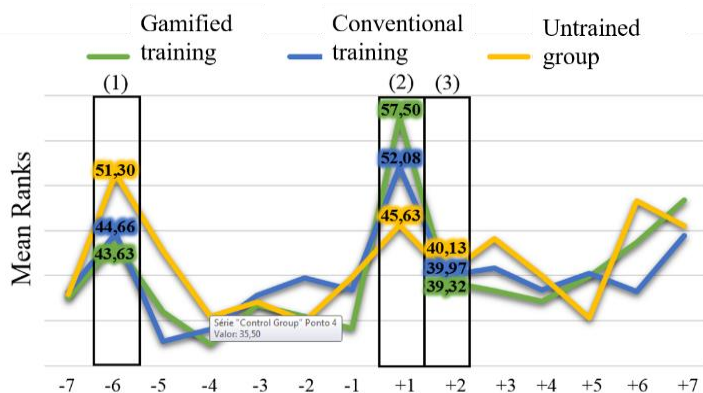
Figure 2. Task engagement - longitudinal view

Discussion and conclusions

The main objective of this study was to analyze the effects induced by gamification in the transfer of training through managers' engagement in performing the task of recording written feedback to the employees under their supervision. Our first contribution to scholarly research is the evidence found that gamification influences the behavior of employees and their engagement to perform tasks. This finding is in line with recent literature that has suggested that the inclusion of game elements positively impacts work practices (Silic & Back, 2017). Another contribution emerged from the finding confirming that the positive effects of training are affected by contextual variables and tend to decay quickly over time if supportive actions for applying what has been learned are not implemented. The literature states that transfer of training measures can be implemented immediately after training or after a certain period, and it is expected that the relationships are stronger the closer the measures are to the training experience, both in the physical and temporal context (Barnett & Ceci, 2002). This is reinforced by recent research indicating that employees' engagement is distributed and flows among a set of tasks, losing strength depending on the task attributes (Newton et al., 2020).

This study has a limitation of measuring the effect of gamification only in the number of written feedback reports and not in their quality. Studies measuring the effectiveness aspect are believed to be more consistent than those that measure the amount of use. The interest of researchers and organizations is usually in the useful application of the training KSAs and not in their simple use (Blume et al., 2010). Future research should aim at investigating how gamification impacts the quality of employees' work on their daily tasks. Collaborative and competitive gamification should be combined to investigate how individuals respond to each type of gamification. Future studies on gamification in business settings should also seek to differentiate the effects that gamification has on employees and customers.

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