

Impact of Gamification on Learning and Development

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Abstract

Gamification in learning and instruction is thought to appeal to a wide range of learners by increasing motivation, learner engagement, and social impact. This study aims to give a synthesis of the empirical findings of state-of-the-art literature in the burgeoning topic of gamification in the learning and teaching domain. It presents the most recent scientific evidence on developing trends in technology education and gamification plugins, but also extending the possibilities for future research directions in using gamification to transform instruction and learning. The adoption of gamification in learning and instruction is perceived to have mass appeal among the learners in stimulating motivation, learner engagement and social influence. Various responses and observation were made from employees to study the behavior in a controlled environment in order to understand the level of competency, social relatedness, meaning full task and there decision making freedom.

Keywords: Gamification, Learning and Development.

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OBJECTIVE

Gamification is the technique of integrating game principles and concepts to learning or training settings to make them more engaging and interesting for the learner. Learners directly compete against a or more individuals in game-based learning events or participate independently in an interactive experience that in some manner awards learning performance.

Objectives

1. To understand the Gamification in T&D and its scope
2. To understand how companies are using and benefiting out of this: Usability & Challenge

INTRODUCTION

When a new study literature emerges around a supposedly novel organizational concept, the most crucial issue to address is the development of a formal definition. As previously stated, the lack of an agreed-upon definition of gamification impeded both public perception of its worth and academic progress in studying it during its early years of popularity. In short, anything labelled "gamification" was immediately dubious, first because gamification was not deemed a novel or distinctive concept, and second, because many of the gamification implementations that received press

attention were at best gimmicky and at worst downright damaging.

Theory of Gamified Learning

The theory of gamified learning, which consists of two components: game element attribute categories and a process model, can be used to understand the possible impact of gamification (Landers, 2015). In conclusion, game element attribute categories (see Table 1), which were developed by Bedwell and colleagues (2012) in the context of serious games, provide a theoretically grounded yet practical framework for implementing individual game elements in the learning environment. These categories group together game aspects that have been associated to learning outcomes in the past and can be used to non-game instructional techniques. The indirect influence is explained by the process model (see Table 1), which is the second component of the theory. Gamification, according to this approach, influences learning through mediating or modifying learning-related actions and attitudes. Game features impact learning-related actions and attitudes, which are the basic mechanism for increasing learning outcomes, during the mediation process. Game components improve or lessen the existing association between learning-related behaviors and learning outcomes during the moderating process. When the game element attribute categories and the

game element attribute categories are combined, the game element attribute categories and the game element attribute, process model provide a parsimonious

theoretical framework of gamification in a training and development context.

Table-1: Theory of Gamified Learning

Theory of Gamified Learning Game Element Attribute Categories and Definitions	
Game Element Attribute Categories	Definitions
Action Language	The method & interface by which communication occurs between a player and the game itself.
Assessment	The method by which accomplishment and game progress are tracked.
Conflict/Challenge	The problem faced by players, including both the nature and difficulty of those problems
Game Fiction	The fictional game world and story
Immersion	The affective and perceptual experience of a game
Human Interaction	The degree to which players interact with other players in both space and time.
Rules/Goals	Clearly defined rules, goals and information on progress

Employee development is nearly unanimously acknowledged as a strategic instrument for a company's long-term growth, productivity, and ability to retain valuable people. If firms ignore certain problems, the employee development process will be time-consuming for management, irritating for employees, and of questionable value for both.

Employee Training Methods

Employee development can take place on the job, with a manager or an experienced coworker directing the activity in the context of the actual work environment. Other types of development take place in training facilities or other places. Organizations are increasingly using online techniques to train their personnel.

- **COACHING:** A more experienced or skilled individual provides advice and direction to an employee in order to help him or her develop new skills, increase performance, and improve the quality of his or her career. Coaching is defined by the fact that it is individualized and customized, that it has a specific business goal, and that it is usually done one-on-one over time.
- **MENTORING:** Through official or informal mentoring programmes, less experienced employees are paired with more experienced colleagues. Formal mentoring programmes can help women and people of color reduce turnover, promote recruiting, and improve performance and the work environment.
- **INDIVIDUAL DEVELOPMENT PLANS:** Organizations might utilize an individual development plan to help employees learn faster (IDP). This document outlines an employee's aims, learning outcomes, and the support required to achieve his or her specific growth objectives. Adult learning practices, experiential learning, and symbolic interaction are all examples of beneficial IDPs.

- **THE 9-BOX GRID:** The 9-box grid is a technique for evaluating an individual employee's current and potential levels of contribution to the organization. The grid is most used in succession planning to assess a company's talent pool and identify possible leaders. The 9-box grid provides a visual reference for performance appraisals that can include appraisal and assessment data, allowing managers to see employees' existing and projected performance.
- **CROSS-TRAINING:** Cross-training is the process of preparing employees to perform tasks that are not ordinarily assigned to them. Cross-training might be a one-time or sporadic fix, or it can be a long-term, systematic approach. Cross-training may not always lead to immediate progress, but it does show that an individual is eager to learn new skills. This range of skills could help him satisfy the requirements for future promotions.
- **JOB ENLARGEMENT AND JOB ENRICHMENT:** Enlargement entails increasing the complexity of an employee's job by adding extra tasks and responsibilities. Through more power, responsibility, and discretion, job enrichment adds dimension to an employee's position.
- **JOB SHADOWING:** More than merely following a coworker about all day is required for job shadowing. Shadowers gain a unique perspective on the organization and gain firsthand knowledge of the issues faced by employees in other departments. This viewpoint allows employees to see how their decisions affect other people.

The objective of this paper is to elucidate the concepts, highlight the advantages as well as the disadvantages (if any) of three major technologies that are currently trending in workplace training:

Gamification

Massively Open Online Courses (MOOC)

Virtual and Augmented Reality (VR/AR)

1) Gamification

Gamification is a new buzzword in the corporate sector that loosely refers to anything that is even somewhat like gaming. According to (Sitzmann, 2011), the phenomenon of using games in the business world is not new and has been for a long time, but gamification as a concept is distinct and considerably more recent. It is precisely defined as the act of improving specific processes by infusing them with gaming components (such as leaderboards, points, career graphs, and so on) in order to improve the amount of interest produced by them, hence increasing the productivity of the person executing the task. Recent research shows that gamification of training components, such as the use of points, badges, and leaderboards, as well as other more intricate characteristics like challenges and plot stories, can be used to improve learning outcomes.

2) Augmented Reality and Virtual Reality (AR/VR)

Augmented reality (AR) is a new technology that is changing the way people interact with computers. It is a technology that allows the user to exhibit digital information in the form of interactive and wearable visualization systems to devise, develop, and execute new, original techniques that allow the user to exhibit digital information in the form of interactive and wearable visualization systems. Virtual reality is an electronic simulation of artificially generated, computer-based settings that is experienced through specialized head-mounted eye goggles and wired clothes and accessories, allowing the end-user to interact with realistic and immersive three-dimensional environments (Coates, 1992).

3) Massive Open Online Courses

MOOCs (pronounced mooks) are full-length academic courses (accessible as videos) that may be disseminated and developed to serve many learners from all over the world at a little to no cost. These courses must meet all the goals while requiring minimal registration and being delivered via the Internet. (Perna and colleagues, 2014).

LITERATURE REVIEW

This section gives an overview of the primary and secondary sources of information used in this paper. While gamification is not technology-dependent, it has enabled corporations to deliver game-like aspects through platforms like social media. Gamification, like game theory, is linked to several disciplines, including sociology and psychology, that are applied to the game-like aspects given through technology. The goal is to motivate or engage people to do a better job at their jobs in order to help the company achieve its objectives. Because many of the concepts and data used in

Gamification are not found in academic literature, business literature is used to supplement academic work. The purpose of this assessment is to bring together the many parts of Gamification and show that the concept is viable and can be implemented by a company with a compatible business plan. There has been a lot of research in the domain of motivation and organizational incentives, according to *Hilmarsson and Rikhardsson (2011)*, which has resulted in "a higher understanding of human motivation and a greater capability to motivate through corporate incentive systems." In a recent essay by *Nicholson (2012)*, who claims that the major purpose to gamify is to drive the individual into doing something, academic literature on Gamification framework is only beginning to emerge.

Gamification, according to *Werbach and Hunter (2012)*, can be a strong tool to apply to an organization's existing business practices. "Many of the best game mechanisms in business don't even look like games to those participating," they say. The core of games isn't entertainment...it's synthesis of human nature and dexterous design." Gamification apps are most effective when they are centered on the users/employees through the usage of User Center Design, which places the individual user's needs at the center of all elements. "Meaningful Gamification" is defined by *Nicholson (2012)* as "the integration of a user-centered game design element into non-gaming contexts." It's worth noting that, according to *Werbach (2012)*, non-game contexts indicate that a game is being played for a reason other than the game itself, implying that it's being played for "some objective other than the game's success." In terms of badges and leader boards, most frameworks govern how Gamification works. While function is crucial, the organization's framework and users are the focus of this study. Before deciding how Gamification will be given, you must first lay a framework.

DiTommaso presented one of the first Gamification frameworks (2011). He mentions that there are seven different aspects of Gamification to think about. The validity of each component of DiTommaso's Gamification framework will be determined by comparing it to a company that has effectively adopted Gamification using literature. The framework addresses the following seven areas:

- Understanding the business need to gamify
- Understanding your users
- What are the goals and objectives?
- Identify Necessary Skills and Actions
- Identify the Game Elements
- What are the desired outcomes?

The primary purpose of incorporating Gamification into a workplace is to enhance existing systems. "Incenting behaviors that employees already know they can and should undertake, but that they

might otherwise procrastinate about, or disregard altogether," write Mehta and Kass (2012). This implies that before incorporating Gamification into a company's systems, it is necessary to first understand how the company operates.

The process of a company's human resources being developed and trained is very old, perhaps perhaps as old as the concept of education. When we look at the history and stories behind the evolution of education, we discover that the earliest form of education was survival-driven learning, which was taught by primitive humans to ensure greater survivability during the period when they were exposed to the elements and organisms of nature. The impact of religious beliefs, classical works of art, and literature on formal schooling came next. Following that, war and military strategy began to impact education, resulting in significant changes in the landscapes of scientific and technical education in order to meet the demands of scientific and technological warfare. This was followed by job skills training and the Industrial Revolution's era of science-driven management approaches. Following that, military-style leadership development programmes based on WWII methods, as well as formal workplace team training, became the standard. Finally, the most recent evolution in the field of formal education occurred, which was the development of individuals, organizations, and communities for work-related purposes, with a greater emphasis on human holistic development rather than turning them into single-purpose workforce units. Swanson and *Torraco* (Swanson & *Torraco*, 1995).

With new technology developments coming at a quick speed, it's become critical for HR departments to guarantee that their employees' knowledge and talents keep pace with the changing technologies. In the last decade, firms' present training and development strategies have undergone significant changes. Gone are the days when workplace training was limited to paper-and-pencil learning sessions led by supervisors on the job. With the advancements in technology in recent years, workplace training can now be scheduled on the trainee's request and at a time and location of their choosing (*Kraiger & Ford*, 2007). Workplace training has grown more dynamic, immersive, and individualized because to technologies like gamification, massively open online courses, virtual reality, and augmented reality. The practice of training and developing human resources arose from the assumption that it encompassed a limited set of duties and objectives. Rather from being considered as a tool for individual employee improvement, it is now viewed as a tool for increasing total team efficiency and morale. Apart from that, in the twenty-first century, the notion of learning and development encourages organizations and businesses to gain a competitive edge through collaborative learning. (*Klein, Clarke, and Noe*, 2014).

RESEARCH METHODOLOGY

Industry managers are attempting to discover ways to make training more engaging and involve a higher degree of engagement. As a result, new and innovative ways for training personnel have been adopted. As a result, an empirical study was conducted on the use of gamification in training by selected firms as a method of training personnel. As a result, by focusing especially on web site content, this research study builds on past research and data. Case study analysis was used as a research method to better comprehend the above-mentioned aims and their implications for the future.

ANALYSIS

To test the effects of specific game design elements, grouped in varying configurations, on motivational need fulfilment, we conducted a Survey. The main research interest of our study was to better understand how and to what degree certain game design elements affect psychological need satisfaction of employee during training & Development; we also proceeded with understanding few case studies from various companies.

CASE STUDIES

CISCO

Cisco employs gamification in several significant initiatives. Our Social Media Training Program is one programme where we've used gamification tactics extensively. Cisco's Global Social Media Team has been investing in our Social Media Training Program for the past two years. This programme provides a one-of-a-kind chance for Cisco workers and contractors to hone their social media skills. And the possibilities for putting the talents they learn to use are endless. Sales account managers, for example, learn to use Twitter to communicate with clients, while human resources staff learn to use LinkedIn to communicate with potential applicants. Many other professional categories, such as marketing (of course!) and product development, also benefit from social media. There are various social networks out there, and different methods to use social media in a corporate setting, therefore the skills linked to social media are diverse. The programme includes over 46 courses, including Social Media Security & Privacy and Getting social media Buy-in. What is the best place for a beginner to start? Levels of Progression This is where the concept of gamification comes into play. There are three levels of certification in the Social Media Training Program: Specialist, Strategist, and Master. Players must demonstrate growing degrees of social media proficiency at each level of certification. Players must complete 15 courses to get the Specialist level.

Players must complete an extra 13 courses and write a blog post to get the Strategist level. At the Master level, players must complete ten courses and

create a case study that demonstrates an integrated social media effort or a social media strategy. There are also four sub-specializations to choose from

- Social Media for HR
- Social Media for Sales
- Social Media for Executive Communication Managers
- Social Media for Internal Partner Teams

Individuals in specific job functions might benefit from these specialities by learning social media skills that are directly pertinent to their profession. Team Challenges add some fun to the mix. Furthermore, the programme includes team tasks in which participants can work together in small groups or as a full company to obtain the certification. This is a good approach for employees in a company to learn new skills together. Completing team challenges also earns players badges. Getting things going Motivation Learning is frequently an action that is naturally driven. The challenge of mastering new talents appeals to many people. And learning new professional skills can help them advance in their careers. And, when you combine the intrinsic motivation with gamification techniques, this further encourages participation and engagement.

The Social Media Training program and the use of Gamification drive engagement through:

- Exploration: Players have fun exploring social media topics. There are many courses available, and participants can learn about the different aspects of social media through the courses.
- Progression Loops: Players can go through several stages of study with three levels of certification, four sub-specializations, and midway level successes. Each class finished represents a little accomplishment. Each level of certification presents a greater challenge. For the core learning track, the purpose of the game is to progress from Specialist to Master.
- Teamwork: Humans are social creatures. In addition, the team challenges allow players to work together and compete against one another. It can be enjoyable to work as a group to attain a common goal. Over 650 people have been certified, with over 13,000 courses completed. And the number is increasing by the day. At Cisco, we're only at the beginning of our gamification adventure. At Cisco, gamification is used in a variety of ways, including the Social Media Training Program. Our team's challenge is to continue to develop new gamification use cases to increase engagement.

XEROX

Game elements are being used by Xerox in a variety of ways, including management training. Within the Stepping Up programme, for example, the user is required to apply taught skills in on-the-job exercises known as Quests. Quests are frequently carried out with

other gamers, promoting social connection. Users' progress is acknowledged on the Yammer site as a result of the integration, offering another degree of social interaction.

IBM

Kudos Badges are used by apps like IBM Connections, which is displayed below. The Kudos Badges Leaderboard allows users to see who the most valuable contributors are across all of Connections. Users gain rank by doing things like updating their status, starting a blog, sharing a file, or having someone recommend your content. Users may see the top 10 Kudos Leaderboard across the platform or inside individual features like Profiles, Activities, and Blogs in Connections. Bunchball's Nitro is also being integrated into IBM Connections. New IBM Connections customers are urged to familiarise themselves by using the gamification aspects provided with Nitro.

METHODS

Participants in the study were recruited online in the firm. A total of 95 participants were involved in the study. Out of 95 participants, 48% were women and (52%) were men. The average age was 22 -35 Years.

Survey instrument

Well-structured questionnaire was developed for conducting the study. Questionnaire included statements. Respondent had to just encircle the appropriate choice.

Where 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4=

Where 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4=

Where 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4 =Agree, 5= Strongly Agree

Keeping 50% observation to be successful response

We investigated the following research questions and hypotheses.

Research Question 1

To what extent do game design element groups affect competence to achieve success?

All gamification elements that provide players with specific feedback on their performance should evoke feelings of competence. Thus, we expected that badges, leaderboards, and performance graphs would foster experiences of competence. This led to our following hypothesis:

Control Condition: It refers to external factor where stress of time and task is given.

H0: Participants in a game condition with badges, leader boards, and performance graphs does not experience higher levels of success than participants in a *control condition*.

H1: Participants in a game condition with badges, leader boards, and performance graphs experience

higher levels of success than participants in a *control condition*.

Table-2: Research Question observation RQ1

<i>While playing I had feelings of success</i>	Answers
Strongly Disagree	5%
Disagree	5%
Neutral	20%
Agree	56%
Strongly Agree	14%

On basis of observation from the survey 56% participant agreed on the fact of feeling competent and and felt successful on achieving a milestone of completing project. participants in the game design element condition with badges, leaderboards, and performance graphs had significantly higher levels of competence need satisfaction than participants in the control condition. This result supports H1

Research Question 2

To what extent do game design element groups affect autonomy need satisfaction regarding decision freedom?

One way of offering choices is by using avatars, which are included in a game condition

together with a meaningful story, and teammates. We expected that a game condition that includes avatars can cause players to experience feelings of autonomy regarding decision freedom. This led to the following hypothesis:

H0: Participants in a game condition with avatars, a meaningful story, and teammates does not experience higher levels of decision freedom than participants in a *control condition*.

H2: Participants in a game condition with avatars, a meaningful story, and teammates experience higher levels of decision freedom than participants in a *control condition*.

Table-3: Research Question Observation RQ2

<i>While playing I could make my own decisions</i>	Answers
Strongly Disagree	10%
Disagree	15%
Neutral	27%
Agree	33%
Strongly Agree	15%

Based on above observation Participant observed to be around 33% Agreeableness on the autonomy of decision-making mindset, but none of the observation did not clear 50% threshold mark cannot be implement in the positive value addition to the system

Research Question 3

To what extent do game design element groups affect autonomy need satisfaction regarding task meaningfulness?

One way of generating meaning within a game is to use a story that embeds the game environment

within a larger, fictional narrative. Thus, a story can evoke volitional engagement and subsequent experiences of autonomy in regard to task meaningfulness. This led to the following hypothesis:

H0: Participants in a game condition with avatars, a meaningful story, and teammates does not experience higher levels of task meaningfulness than participants in a *control condition*

H3: Participants in a game condition with avatars, a meaningful story, and teammates experience higher levels of task meaningfulness than participants in a *control condition*.

Table-4: Research Question Observation RQ3

<i>It was worthwhile playing the game</i>	Answers
Strongly Disagree	1%
Disagree	15%
Neutral	27%
Agree	51%
Strongly Agree	5%

Based on the observation from the participant 51% agreed on the meaningfulness of task as it provides

them with objective of working and doing task, this hypothesis can be considered valid as it creates a

pertaining mindset in an employee to achieve something out of task and enable them to be performer.

Research Question 4

To what extent do game design element groups affect social relatedness need satisfaction?

Playing as part of a team can induce feelings of belonging, and thus contribute to the experience of social relatedness. A suitable story in addition can strengthen these feelings, if it stresses that one's efforts

are important to the team's success. This led to the following hypothesis:

H0: Participants in a game condition with avatars, a meaningful story, and teammates does not experience higher levels of social relatedness need satisfaction than participants in a control condition

H4: Participants in a game condition with avatars, a meaningful story, and teammates experience higher levels of social relatedness need satisfaction than participants in a control condition.

Table-5: Research Question Observation RQ3

While playing I felt I was part of a team	Answers
Strongly Disagree	7%
Disagree	15%
Neutral	18%
Agree	43%
Strongly Agree	17%

Participants in the game design element condition with avatars, meaningful stories, and teammates had significantly higher levels of social relatedness need satisfaction than participants in the control condition and participants in the experimental condition 1. Accordingly, H4 could be confirmed.

DISCUSSION

The results of the study indicate that certain game design elements address specific psychological needs, in as much as they are recognized by the users. As expected, the group of game design elements with badges, leaderboards, and performance graphs positively affected competence need satisfaction. This is consistent with theoretical considerations about the potential of badges, leaderboards, and performance graphs to act as feedback elements and thereby address experiences of competence.

Furthermore, badges, leaderboards, and performance graphs also seemed to contribute to an increase in perceived task meaningfulness. One possible explanation for this unexpected result is that badges, leaderboards, and performance graphs can also create meaning at game level. The game design element group with avatars, meaningful stories and teammates did not affect perceived task meaningfulness. It was expected that the story would render the prescribed path within the game a volitionally engaging experience and thus foster perceived task meaningfulness.

The game design element group with avatars, meaningful stories, and teammates, on the other hand, did successfully affect experiences of social relatedness. The group of game design elements with avatars, meaningful stories, and teammates introduced a shared goal and led to feelings of relevance in accord with our theoretical considerations, experiences of social relatedness were fostered.

Table-6: Confirmation on Finding

Findings	Observation
Competence	Confirmed
Decision Making Freedom	Insignificant
Meaningful Task	Confirmed
Social Relatedness	Confirmed

RECOMMENDATIONS

Companies can understand problem first and then they can go for specific Gamification module instead of just buying any software without understanding its outcomes and results.

Proposed Gamification Flow Model

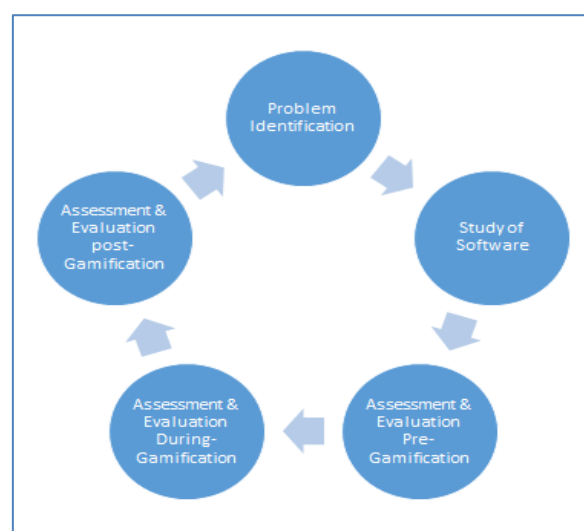


Fig-2

CONCLUSION

In today's technology-driven economy, everyone expects immediate solutions to all concerns. Devoting time to training and receiving feedback over a long period of time results in the training's goal being

lost. Companies and employees desire an engaging and results-oriented learning process. With the rise of internet usage and the integration of many learning platforms, this is now achievable. Gamification allows organizations to stimulate employee learning through a common platform that can engage and drive employees to learn new advancements in their fields of work. Many businesses are transitioning from traditional Gamification or training and development strategies to new digital Gamification strategies to train and engage their staff and stakeholders.

The usage of game principles to aid learning and development shifts our focus away from typically obsolete views of knowledge acquisition and toward thoughts of pushing employees' learning capabilities and capacities. Learning and development that is gamified can assist employees in their quest for mastery. Gamification, when done right, may assist an employee enhance their skills while also allowing them to take risks and fail in a safe environment. Health and safety training, as well as leadership development, are examples of learning and training that have already proven to be quite successful when applying gamification techniques.

Gamification has the potential to engage employees in ways that have never been seen before. "Games build on nostalgia, curiosity, visual appeal, and staff interest to create an emotionally appealing atmosphere for the player." They have an emotional connection with the gamer and serve as an invitation to explore a new universe." By appealing to employees' sense of fun, incorporating these principles into the internal organizational environment may increase engagement. The use of LinkedIn's profile completion tool is a basic example of a game-like tool aimed at persuading users to engage more deeply with an idea. It might be about using game features (e.g. points for cross-departmental project teams) to foster teamwork and collaboration inside an organizational business setting, presuming those are fundamental business imperatives.

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REFERENCE

1. Hilmarsson, S. T., & Rikhardsson, P.
2. Hilmarsson, S. T., & Rikhardsson, P. (2011). The evolution of motivation and incentive systems research: A literature review. Available at SSRN 1965646.
3. Lamprinou, D., & Paraskeva, F. (2015, November). Gamification design framework based on SDT for student motivation. In *2015 International Conference on Interactive Mobile Communication Technologies and Learning (IMCL)* (pp. 406-410). IEEE.
4. DiTommaso, D., & Taylor, C. (2014, October). Beyond gamification: designing behavior change games. In *Proceedings of the first ACM SIGCHI annual symposium on Computer-human interaction in play* (pp. 475-475).
5. Torraco, R. J., & Swanson, R. A. (1995). The strategic roles of human resource development. *Human resource planning*, 18, 10-21.
6. Armstrong, M. B., & Landers, R. N. (2018). Gamification of employee training and development. *International Journal of Training and Development*, 22(2), 162-169.
7. Welsh, E. T., Wanberg, C. R., Brown, E. G., & Simmering, M. J. (2003). *E-learning: Emerging uses, empirical results and future direction*. *International Journal of Training and Development*, 7, 245–258.
8. Training, M. (2018). Training Industry Report for the Year 2018, [online] Available at <https://trainingmag.com/trgmag-article/2018-training-industry-report>
9. Stone, D. L., & Deadrick, D. L. (2015). Challenges and opportunities affecting the future of human resource management. *Human Resource Management Review*, 25(2), 139-145.