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Conceptualizing the Role of Gamification in Contemporary Enterprises

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ABSTRACT Nowadays, gamification is used to improve the enterprises' relationship with customers and employees. Employee engagement as one of the significant achievements of gamification is a major factor for increasing organizational productivity. In this paper we try to theorize the role of gamification in the enterprises from the employee perspective. The main objective of this research is to identify the major role of gamification as a new facilitating technology and organizational capability through examining the nomological network of influences. We highlight the strong interactions among three organizational capabilities in the form of mechanic options, dynamics, and positive emotions and their mediating role between gamification competence and enterprise's performance. Using a mixed method through expert interviews and questionnaires, we determined the proposed model and localized it to a 1,000-member banking organization. The proposed conceptual model shows that from a gamification standpoint, what factors and how they can cause and increase the employee engagement and thereby improve the organizational performance and capabilities. Using a mixed method, we have shown that there is a statistically significant improvement with positive emotion and that a good feeling of employees toward the system will have a positive impact on their preference for their work. This paper forwards an important debate on the conceptualizing the role of gamification in contemporary enterprises performance by applying gamified approaches, which contributes to literature on internal and enterprise gamification.

INDEX TERMS Gamification competence, enterprise gamification, engagement, mechanic options, enterprise performance, internal gamification.

I. INTRODUCTION

In today's competitive world, companies need to compete among each other to survive and satisfy all their stakeholders and shareholders [1]. To succeed in such a competitive environment, the use of new technologies is a necessity. Gamification as a new technology based on information and communication technologies [2], has attracted the attention of contemporary enterprises in the last few years [3].

Gamification is an umbrella term for the use of game elements in nongaming systems to improve user experience and user engagement [4]. Enterprises are one of the important areas for applying gamification. Nowadays, all organizations, including government, private, service, manufacturing, and research, are seeking ways to improve productivity and improve their performance indicators. Enterprise gamification try to use game design elements to engage, motivate, and persuade employees, customers, and partners to develop productive behaviors [5]. Usually, work and play do not get together, however, gamification gives the opportunity to mix the two [6].

Gamification increases the engagement of employees in the organization [3], [7], and since there is a significant relationship between employee engagement and employee performance, in turn, also promotes organizational performance [8], therefore gamification can be considered as an organizational capability.

Nowadays, many technologies, including gamification, may be used in organizations. However technology per se can't have a positive effect on organizations, and its proper use can have an impact on the productivity of the organization. Since people use technology, the proper use of technology depends on how it interacts with human. When people interact with technology in their current activities, they enact

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dynamic structures that shape their emergent use of that technology. These structures of technology use (technologies-in-practice), are rules and resources that are constituted in people's recurrent engagement with technologies [9].

In fact, we can say that the technology-in-practice includes emotional and mental factors that individuals declares when they use the technology. Although the word emotions is usually used to express affective experiences, but more accurately, emotion is a term that reflects the discrete responses of an internal or external event including subjective experience, bodily response, expression, and action tendencies [10]. Therefore, emotion plays an important role in technology-in-practice and consequently in the technology adoption in the enterprises; and positive emotion can significantly enhance engagement in the workplace [11]–[13].

The objective of this paper is to identify the major role of gamification as a facilitating technology and organizational capability through examining the nomological network of influences. In this regard, the role and position of employee emotions is also considered as a significant factor in creating interactive structures between employees and gamification technology.

We consider gamification competence as enterprise's capacity for developing gamification which including important elements such as level of gamification investments, the quality of the gamification infrastructure and enterprise's human conditions for gamification adoption.

According to Fig 1, we will show that gamification competence influences enterprise performance on basis of a nomological network model of three significant concepts contain mechanic options, dynamics, and emotions. The role of gamification is shown as a factor affecting the enterprise's performance through theories and concepts extracted from related researches.

Through this theorizing, we attract attention to a key role of gamification as a mechanic options generator in contemporary enterprises.

Then, to evaluate the proposed model and design of a gamified system to increase employee engagement, we will determine factors such as capability-building and behavioral change processes using the mixed method through expert interviews and questionnaires and we will run it for a 1,000-member banking organization.

The rest of the paper is organized as follows. First, we express the theoretical foundations of the model. Second, we develop propositions. Finally, we sum up with further discussion about the results.

II. LITERATURE REVIEW

The proposed conceptualization of this study could be described by two streams of literature. First is enterprise gamification literature and the second is employee engagement and its relation to enterprise performance. Gamification and engagement are both new and hot topics in business literature [14]–[16]. In this section, we will review the literature of these two domains.

A. THE ENTERPRISE GAMIFICATION: PLATFORM FOR DYNAMICS AND EMOTIONS IN ENTERPRISE

Games have always been part of human life [17]. Games are important due to the attraction of the people's attention and the stimulation of the sense of participation [18]. A game is a voluntary interactive activity in which players follow rules that constrain their behavior and enacting an artificial conflict that ends in a quantifiable outcome [19]. Game science is to study the games using various tools and apply the assumptions of many natural sciences, social sciences and engineering fields [20]. Gamification science can be defined as a subdiscipline of game science that uncovers the many techniques for using of the game elements in real-world processes [21].

There are many definitions of gamification. We review some of these definitions. Gamification as a game-based technology is attracting increasing attention among practitioners and researchers [22].

Gamification is defined as 'The process of game-thinking and game mechanics to engage users and solve problems' [23]. Some researchers have defined gamification based on behavioral perspective as "Gamification is a designed-behavior shift through playful experiences" [5]. Gamification exists when gaming elements are used within non-game contexts [24]. The gamification is based on the fact that human activities are carried out due to intrinsic motivations [25]. Therefore, the design process of the gamification should be a human-centered process.

Nowadays, the gamification has various applications in different fields such as education [26], [27], e-commerce [28], social issues [29], innovation [30] and healthcare [31], [32]. Enterprise gamification contains a set of gamification applications in an organization that, as previously mentioned, means the use of the game in the organizations to improve user engagement and consequently upgrade of the organizational performance.

There are some studies about the impact of game and gamification on human's psychological factors such as motivation and engagement. The two concepts of motivation and engagement are close to each other at the heart of Self-determination theory (SDT) [33]. The three main features of the SDT are psychological needs to make choices, competition and collaboration with others, all of which can be covered by the gamified environments [34].

Organizations are always seeking to increase the engagement of their employees and customers. Many studies have been done on the positive impact of the gamification on participants' attitude [35] and their engagement [7], [36], [37].

Designing and implementing enterprise gamification is not an easy task, and it requires looking at various factors such as organizational goals, organizational structure and culture, and also motivating factors for users [5]. In other words, the design of the enterprise gamification is done correctly when the design process from organizational strategies to value creation is fully taken into account [38]. In fact, how to use fun features in the workplace is important and should

be judiciously employed and properly incorporated because it can have the opposite unintended effect if all aspects of the issue are not addressed [39].

Gamification as an academic topic is still young and only a few frameworks have been presented to describe it [40], [41]. Similarly, the literature review shows that there are few research works about enterprise gamification framework and methodology. One of the basic frameworks for enterprise gamification is MDE that includes three main concepts, Mechanics, Dynamics and Emotions [15].

Mechanics are at the level of data representation and algorithms and form the functioning components of the game such as Levels, Points, Leader-boards and Badges. In fact mechanics are the result of designer's decisions about topics such as goals, rules, setting, context and type of interactions in the game which is applied for the considered field [15].

The gamification dynamics refers to the different behaviors of players in the game. In other words, it shows how players use the game mechanics which has been chosen by designer. These dynamics describe behaviors and the strategic actions and interactions during the play [42].

Emotions are the affective states and reactions of players when they participate in the gamified experience. Therefore, gamification emotions are the products of the mechanics usage and the dynamics creation in the players [15].

In a real case, when employees of an enterprise act as players in a gamified experience of their work environment, they actually encounter gamification mechanics which have been designed by designers. When the employees use these mechanics, they exhibit behaviors or dynamics that lead to certain emotions in them. These emotions can be represented in different forms, for example in a positive form such as excitement, amusement, amazement, and surprise or in a negative form like disappointment and sadness [43], [44]. Therefore gamification can be a platform for making dynamics and emotions in enterprise.

B. EMPLOYEE ENGAGEMENT AND ENTERPRISE PERFORMANCE

Human resources are the most important factor for organizations. One of the important terms in the Human Resource Development (HRD) literature is engagement. There are several definitions about engagement in the related literature [45]. Kahn [46] defined engagement as ''the simultaneous employment and expression of a person's ''preferred self'' in task behaviors that promote connections to work and to others''. He also introduced the concept engagement as ''the harnessing of organization members' selves to their work roles'' and added engaged people ''employ and express themselves physically, cognitively, and emotionally during role performances''.

From the psychological perspective engagement in an experience includes the involvement, energy, and the efficacy which is felt by an individual in that experience [47]. Therefore, engaged employees have higher levels of energy and do their job actively and with enthusiasm [48], [49].

Employee engagement is the cognitive, emotional, and behavioral energy of employee that leads to positive organizational outcomes [50]. Fleming and Asplund [51] as Gallup researchers, consider employee engagement as the ability to capture the heads, hearts and souls of employees.

Employee engagement involves three parts including intellectual, emotional, and social engagement in the work. Intellectual engagement is the level which employees are attracted to work and think about ways to improve it. Emotional engagement is the extent to which employees feel positive about their work and the organization [52]. Social engagement reflects the extent to which employees talk with their colleagues about improving work in the organization [53]. In opposite, employee disengagement leads to negative feelings like anger, disappointment, despair and frustration and physical disengagement can be revealed for example, as tiredness and stress, loss of confidence and child-like behaviors [54].

Engagement is a way to increase employee productivity and performance. There are many studies that have confirmed this meaning [45], [55]–[57]. In other words, there is a strong significant relationship between employee performance and employee engagement and the employee performance, which includes financial and non-financial outcomes, is directly related to the performance of the organization [8].

Various studies indicate that the employee engagement improves the financial and non-financial performance of the organization [58]–[60]. For example, Aon Hewitt Consultancy, in an report called ''Future of Engagement 2014'' mentions one disengaged employee is equivalent to -$ 1000 average annual profit and one highly engaged employee is up to 78 percent more productive and 40 percent more profitable [61]. Karl *et al.* [62] Examining the impact of fun at work on enhancing recruitment and retention, showed that a fun workplace can lead to higher job satisfaction.

According to the aforementioned literature, in general, we can say that the enterprise gamification can act as a platform for making dynamics and positive emotions in the employees, thereby improving employee engagement and, consequently, improving organizational performance. On the other hand, as explained, the main gap is that in the field of enterprise gamification, so far no nomological network has been provided to study the effects of gamification technology on important organizational factors such as employee engagement. Therefore, in this study, we try to theorize these relationships in the form of hypotheses and evaluate them. In this regard, more details are provided in the following sections.

III. THEORETICAL MODEL

According to Fig 1, the proposed theoretical model as a nomological network of influences highlights three important capabilities, including mechanics options, dynamics and emotions, as well as three processes including capability-building, behavioral change, evolutionary adaptation that mediate between gamification competence and enterprise

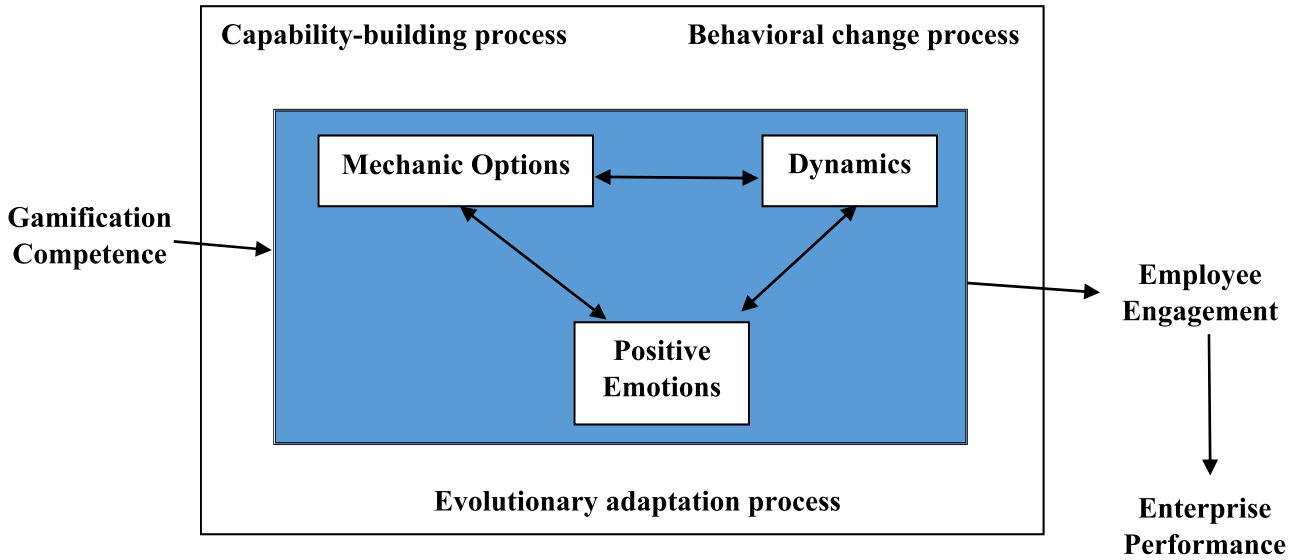

FIGURE 1. The nomological network model of relationships between gamification competence and enterprise performance.

performance. This model shows that from a gamification standpoint, as a facilitating technology, what factors and how they can cause and increase the employee engagement and thereby improve the organizational performance and capabilities.

A. GAMIFICATION COMPETENCE

Gamification competence describes enterprise's capacity for developing gamification. In other words, gamification competence is a major prerequisite for fulfilling of enterprise gamification. Important elements of gamification competence include the level of gamification investments, the quality of the gamification infrastructure, enterprise's human conditions (culture and skills) for gamification adoption and nature of the enterprise.

Therefore, it seems that the level of gamification investment, the infrastructure quality to fulfill the gamification, the nature and human conditions of the enterprise have a direct and significant effect on choosing the type of game mechanics and therefore in the way of realizing the gamification. Some of these effects have been confirmed in the related researches. For example, researches like Landsell and Hägglund [63], Bartle [64], and Marczewski [65] emphasize the relationship between users types and gamification and the need to categorize them for design and implementation of the gamification. Fullerton [66] and Caillois [67] consider matching between each player and a specific type of games or mechanics.

Reiners and Lincoln [5] indicate that the enterprise gamification design is complex and related to several factors, such as enterprise goals and users, compensation mechanisms and organizational structure and culture.

In this theoretical model, we expect gamification competence to be as an antecedent of the level of employee engagement and thereby enterprise performance through the mediation of three significant factors (mechanics options, dynamics and emotions).

B. MECHANICS OPTIONS AND DYNAMICS

Mechanics and dynamics are two important elements of gamification. As already mentioned, mechanics are the result of designer's decisions about topics such as goals, rules, setting, context and type of interactions in the game which is applied for the considered field [15]. Mechanics options are probably the most significant part of gamification [68]. There is not a unique definition for mechanics in the literature.

Ruhi [69] considers mechanics as three concepts that include components, courses and controls. Components are such as points and badges that illustrates basic achievements for players. Courses lead the players towards higher levels of play and controls are such as timers and tests that improve player performance. Elverdam and Aarseth [70] believe there are three types of mechanics including setup mechanics, rule mechanics and progression mechanics. The setup mechanics represent settings, the objects needed and how they are distributed among the players in the game environment. The rule mechanics determine the concept or purpose of the game and the progression mechanics include the various tools that designers consider in the game's progression.

Each mechanic can create a dynamic or specific behavior, for example, team-based mechanics will cause dynamics of players' collaboration, while individual-based mechanics will make dynamics of competition [72]. In fact, mechanics are the technologies and organizational systems that managers can use to induce the behaviors and goals they need in the organization [73]. Game designers who use mechanics cannot exactly predict dynamics [72].

TABLE 1. Eight concepts of gamification according to Octalysis framework [71].

Concept	Some related mechanic options
Epic Meaning & Calling	Narrative, Higher Meaning, Elitism, Humanity Hero, Beginners Luck, Free Lunch
Development & Accomplishment	Points, Progress Bar, Step-By-Step Tutorial, Leaderboards, Badges, Quest Lists, Boss Fights, Fixed Action Rewards, Win Prize, High-Five, Level-Up Symphony, Aura Effect
Empowerment of Creativity & Feedback	General's Carrot, Evergreen Mechanics, Real-Time Control, Chain Combos, Milestone Unlock, Boosters, Choice Perception, Voluntary Autonomy, Instant Feedback
Ownership & Possession	Virtual Goods, Avatar, Build From Scratch, Learning Curve, Earned Lunch, Collection Set, Monitoring, Protection, Recruitment
Social Influence & Relatedness	Friending, Mentorship, Group Quest, Bragging, Touting, Water Cooler, Social Treasure/Gifting, Social Prod, See-Saw Bump
Scarcity & Impatience	Dangling, Appointment Dynamics, Fixed Intervals, Moats, Throttles, Countdown, Prize Pacing, Options Pacing, Patient Feedback
Unpredictability & Curiosity	Easter Eggs, Sudden Rewards, Oracle Effect, Mini Quests, Glowing Choice, Rolling Rewards, Random Rewards, Visual Storytelling, Obvious Wonder
Loss & Avoidance	Sunk-Cost Tragedy, Progress Loss, Fear Of Missing Out, Evanescence Opportunity, Scarlet Letter, Status Quo Sloth, Weep Tune, Visual Grave

Various options for mechanics have been introduced and suggested in the gamification literature. Three common mechanics including points (which are used to reward the players), Leaderboards (which provide the opportunity to compare players together), and Levels (which act as an indicator of the players status) [68]. However, many mechanics options have been introduced and used in related research works. For example, mechanics of avatar, narrative, points, feedback, levels and challenges [74], mechanics of feedback, challenges and social interaction [75], and mechanics of badges, virtual goods, avatar, leaderboard, dashboard, feedback, progress bar, points, content and unlocking [76].

One of the important frameworks in the gamification is Octalysis. In this framework Chou [71] represents eight types of core drives that motivate human to do activities including Epic Meaning, Accomplishment, Empowerment of Creativity, Ownership, Social Influence, Scarcity, Unpredictability and Avoidance. He introduces a set of mechanics options for each of the mentioned eight concepts as shown in the Table 1.

Dynamics represents the run-time behavior of the players when performing mechanics [77]. In other words dynamics represent user interactions with mechanics. Ruhi [69] describes dynamics in behaviors such as continuation, consequences, cooperation, competition, completion, chance, choice, context and constraints.

Robson *et al.* [15] have identified cases such as competition, cooperation, coopetition, and cheating as dynamics of different systems.

Mechanic options can enable all types of behaviors or dynamics in the enterprise. In fact, dynamics describe

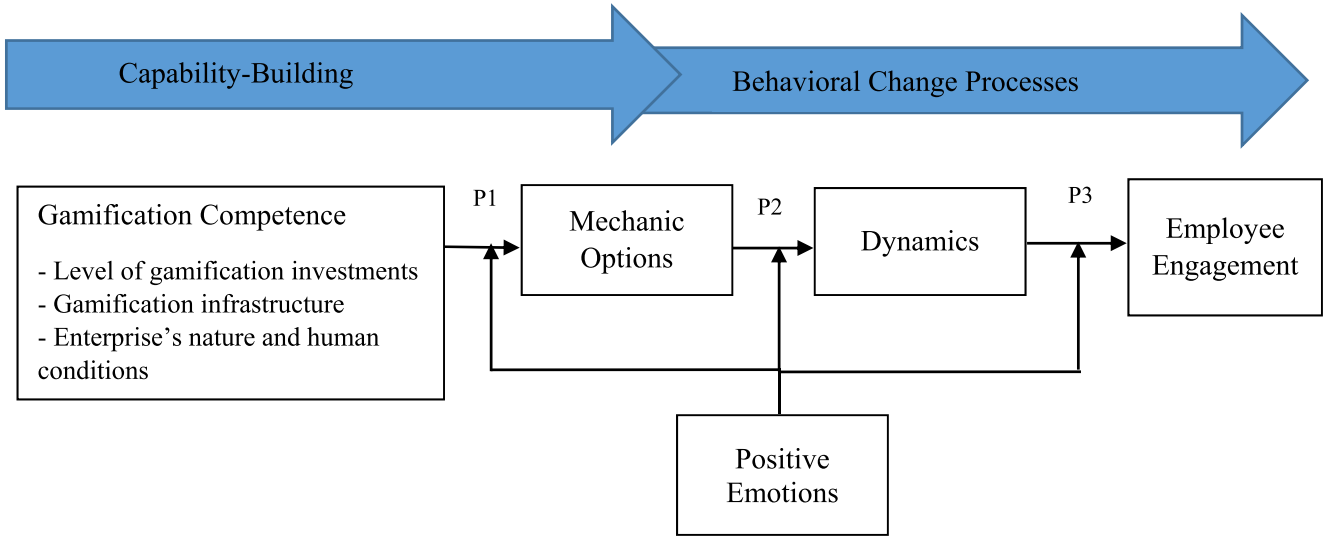

FIGURE 2. Capability-building and behavioral change processes.

behaviors and the strategic actions and interactions during the play [42].

According to the aforementioned literature, there are several mechanics options available to organizations that they can use based on the investment level in the gamification, existing infrastructure, organizational conditions and human features. These mechanics can create dynamics as employees' behaviors in the enterprise. For example, when we use the mechanics of points for efficient tasks of employees, this leads the employees to continue to get more privileges on such activities. Thereby we can see the dynamics of the continuity of efficient activities in the enterprise. We describe mechanic options as a set of gamification-enabled capabilities in the enterprise.

C. EMOTIONS

Emotion is a term that reflects the discrete responses of an internal or external event including subjective experience, bodily response, expression, and action tendencies. Expression denotes motor responses in the voice, face or body that show emotions to others in a social environment [10].

Ekman and Friesen [78] (21), define six basic emotions related to facial expressions: sadness, anger, disgust, fear, happiness and surprise. Of course secondary emotions might be arisen through combining basic ones. However, some researchers like Krämer *et al.* [79] believe the facial expressions are not universal and depending on the culture. Emotion plays an important role in technology-in-practice and consequently in the enterprise gamification deployment.

Gamification emotions are the products of the mechanics usage and the dynamics creation in the players [15]. Some researchers use Aesthetics instead of emotions. Hunicke *et al.* [77] and Ruhi [69], for example, use the word "Aesthetics" for emotional responses of the players, which is the result of playing the game. The emotional responses should not divert the user or player from the desired goals [68].

Emotions are the most important element of game design [80], [81]. The players experience different emotions based on mechanics and dynamics during the game, which can be a positive or negative feeling. However creating enjoyment and positive emotion for players should be the most important goal for their engagement in the gamification [82]. Such enjoyment can be created through positive emotions such as amazement, excitement, amusement, wonder, triumph over adversity and surprise against negative feelings, such as sadness or disappointment at losing a reward [15].

Studies showed that positive emotions were associated with employee engagement and performance, and stimulating positive emotions be required to promote work engagement [83], [84]. Parkinson and McBain [54] acknowledged that emotions have a mediator role on disengagement. Consequently, it can be said that positive emotions resulting from the enterprise gamification increase the employee engagement and negative emotions will reduce it in the enterprise.

D. THE PROCESSES

As already mentioned, the literature related to organizational performance as well as gamification emphasizes the importance of human resources as valuable and important factor of the organizations. In this regard, the significant subject of employee engagement and its role in the improving of the organizational performance has been discussed. Therefore, we identify two human-resource related processes that are important to how enterprises can leverage gamification as a technology for improving the enterprise performance through continuous improvement of the employee engagement. According to Fig 2, these processes are the capability-building and behavioral change.

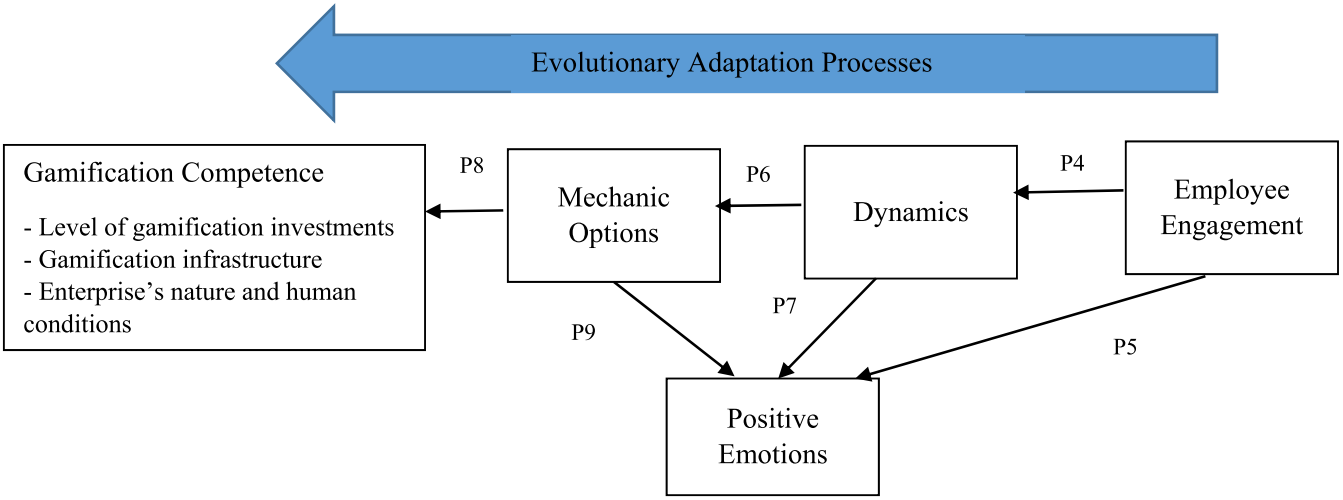

FIGURE 3. Evolutionary adaptation process.

The capability-building processes are defined for using the human resources and their skills to empower the organization and represent the relationship among gamification competence, mechanic options, dynamics and positive emotions for organizational capabilities development.

Enterprises can develop their capabilities over time through the blending of gamification with their organizational processes. Capability-building processes integrate gamification and organizational resources in to enterprise capabilities.

The behavioral change processes also describe how to create positive emotions for employees in order to continuously improve their engagement. Capability-building and behavioral change processes describe the sequence of effects from gamification competence to employee engagement. We develop propositions one, two and three related to these processes.

According to Fig 2, we can say, if employees' positive emotions emerged from the gamification are greater, the effect of gamification competence will be greater on the mechanic options. In other words, at the first step that the enterprise is in the initial level of gamification competence, suitable mechanic options will be implemented using a specific cost. However after successful realization of gamification and making dynamics and positive emotions in the employees, creating higher levels of mechanic options will be possible at a lower cost. It seems, positive emotions facilitate the conversion of gamification competence into mechanic options. Therefore, we can propose:

P1: The impact of gamification competence on mechanic options will be positively improved by the positive emotions.

And also if employees' positive emotions emerged from the gamification are greater, the effect of mechanic options will be greater on the dynamics. For example if we use mechanic options based on social interactions that will cause cooperation dynamics and likely a positive emotion of cooperation in the employees, therefore, this emerged positive feeling helps to the next effect of mechanic options on making dynamics. In other words, positive emotions facilitate the conversion of mechanic options into dynamics. Therefore, we can propose:

P2: The impact of mechanic options on dynamics will be positively moderated by positive emotions.

Finally, if employees' positive emotions emerged from the gamification are greater, the effect of dynamics will be greater on the Employee engagement. In other words, positive emotions facilitate the conversion of dynamics into Employees' engagement. Therefore, we can say:

P3: The impact of dynamics on Employee engagement will be positively moderated by the positive emotions.

According to Fig 3, evolutionary adaptation processes are related to the fact that enterprises experience and learn over time along with development and use of mechanic options and creating different dynamics.

In fact, evolutionary adaptation are processes based on feedback and experience that through successful employee engagement, will boost the three concepts of dynamics, emotions and mechanic options and consequently gamification competence in the enterprise. In fact the learning included in these evolutionary adaptive processes influence the future development of gamification competence. Therefore, evolutionary adaptation describes the sequence of effects in the contrary direction.

For example, for a specific level of gamification competence in a typical enterprise, if we use Points, Badges and Leader-boards as mechanic options in a gamification solution to motivate employees for performing their efficient activities, the competitive behaviors as dynamics will be created among the employees. These dynamics will cause more employees' engagement in their work. After a while, creating higher levels of employee engagement, in turn, can enhance their competitive behaviors (dynamics). It seems that the higher levels of dynamics will also enhance

mechanic options. The well-developed mechanic options can help to increase the level of gamification competence in the enterprise. Therefore, the level of gamification competence including investment, infrastructure and human conditions gradually rises. Of course, enterprises first considers an initial investment to start the gamification. Initial experiences with mechanic options often need additional gamification investments. When enterprise start to make better use of mechanics, their investment level on gamification increases. If the enterprise after the initial evaluation, concludes that the gamification does not have a positive effect, it may reduce or eliminate the investment. On the other hand, we can anticipate well-developed mechanic options will cause more investment and influence the gamification competence. The initial experience of well-developed mechanic options can also lead to reinforce the insight of the enterprise managers and consequently it enhances the gamification competence.

The increased levels of employee engagement as well as dynamics and mechanic options can also enhance employees' positive emotions in the enterprise. Therefore, considering the above, we propose the propositions p4 to p9 as follows:

P4: High levels of employee engagement will enhance dynamics.

P5: High levels of employee engagement will enhance positive emotions.

P6: Higher levels of dynamics will enhance mechanic options.

P7: Higher levels of dynamics will enhance positive emotions.

P8:Well-developed mechanic options will contribute to higher levels of gamification competence.

P9: Well-developed mechanic options will contribute to higher levels of positive emotions.

IV. METHODOLOGY

Using a mixed method through expert interviews and questionnaires, in this paper, we determined and localized MDE framework indicators to design a gamified system to increase employee engagement. Since in this research we have focused on engaging the employees of an organization to enhance its productivity by adopting a gamification-based approach, the field study of this research is internal gamification or enterprise gamification [22]. The organization we considered as the case for this study is Bank Hekmat Iranian. The vision of this organization is to create a reliable bank, with an innovative approach to delivering the highest and most distinctive banking services in the country, making it the first choice for its customers, employees and shareholders. Its mission is to provide customers, employees and stakeholders with the satisfaction of effective and profitable economic activities by relying on creative and innovative human capital and providing superior customer service to maintain mutual and sustainable benefits.

We used the opinion of experts to select the appropriate indicators for research. To this end, among experts in relevant fields, 6 specialists from the field of gamification, 3 Enterprise expert, 4 expert in the field of employee engagement, 5 bank managers, and 5 faculty members of the Banking Institute for Higher Education and Central Bank Monetary and Banking Research Institute (MBRI) were selected.

It is noteworthy that the number of experts was determined by the theoretical saturation of the data and experts views on the mechanic and dynamic factors of the MDE framework were analyzed. Therefore, after selecting the experts and addressing the issue, semi-structured interviews were conducted with each of the experts separately to achieve their insights beyond the basic concepts we extract from the literature and to gather more accurate insights from them. We used Likert scales of 1 to 5 in order to obtain expert opinions in a semi-structured interview, with 5 indicating strongly agree and 1 indicating strongly disagree.

From the hypotheses presented in the previous section, in this study we validate the first three hypotheses P1, P2, and P3, and leave the investigation of other hypotheses to future studies. In the following, the results of experts opinions are discussed in detail.

A. SELECTING A PROPER SET OF MECHANICS

As it mentioned, there are three types of mechanics in MDE framework: setup, rule and progression. The setup mechanics are related to the gamified system settings and the rule mechanics relate to the allowable actions, and constraints of the system, and the progression mechanics relate to the rewards and reinforcements used to increase user engagement. In reviewing the literature, we have summarized a list of the types of mechanics in gamified systems, which are shown in Table 2 along with related references; and in order to refine and select the best set of mechanics for the purpose of this research question, we asked the experts to review the list and report any issue that they consider unrelated, as well as misleading and redundant. They were also asked to rate the provided mechanics in terms of their importance and necessity to use in the gamified system in order to increase employees' engagement.

Experts' opinions on the proposed mechanics were summarized and discussed, and finally, the top three, which includes point, badge, and leaderboard mechanics out of the proposed reinforcement and motivational affordances were selected. It is worth noting that the three mechanics selected are the most popular gamification mechanics, also known as PBL triad [22], [40].

B. SELECTING A PROPER SET OF DYNAMICS

As Robson *et al.* [15] have pointed out, gamified system designers should anticipate a variety of dynamics that make the mechanics more pleasant for the user. Various factors have been introduced in the literature for dynamics. For example, Robson *et al.* [15] have introduced cases such as competition, cooperation, coopetition, cheating as dynamics of different systems. In a similar study, Ruhi [69] identified dynamics as

TABLE 2. Gamification mechanics.

Row	Mechanic	Hamari et al. [40]	Koivisto and Hamari [85]	Werbach and Hunter [22]	Tondello et al. [86]	Uskov and Sekar [87]	Chou [88]	Robson et al. [88]
1	Point	✓	✓	✓	✓	✓	✓	✓
2	Badge	✓	✓	✓	✓	✓	✓	✓
3	Leaderboard	✓	✓	✓	✓	✓	✓	✓
4	Level	✓	✓	✓	✓	✓	✓	✓
5	Avatar		✓	✓	✓		✓	
6	Social interaction		✓	✓	✓	✓	✓	✓
7	Informing				✓		✓	
8	Feedback	✓		✓	✓	✓	✓	✓
9	Count down			✓		✓	✓	
10	Penalty		✓				✓	
11	Epic meaning					✓	✓	
12	Fixed reward	✓	✓	✓	✓		✓	
13	Random reward			✓	✓		✓	
14	Group reward						✓	
15	Virtual reward		✓	✓	✓		✓	✓

continuity, consequences, cooperation, competition, completion, chance, choice, context and constraints.

Table 3 shows a list of the dynamics we have obtained by reviewing the related literature.

In order to select the appropriate set of dynamics, using the structured interview described in the preceding section, we asked the experts to provide their views on the proposed dynamics and to determine the dynamics with respect to their importance and necessity in the gamified system to rank employees in order to increase their engagement. In the following, similar to the previous section, we summarized the ratings provided by experts on dynamics. We came up

TABLE 3. Gamification dynamics.

Dynamic	Robson et al. [15]	Ruhi [69]	Werbach and Hunter [22]
Competition	✓	✓	✓
Cooperation	✓	✓	✓
Coopetition	✓		
Cheating	✓		
Consequences		✓	
Continuation		✓	
Completion		✓	
Chance		✓	✓
Choice		✓	
Constraints		✓	✓

with the four key dynamics that topped the list: Competition, cooperation, cheating, and completion.

C. QUESTIONNAIRE DESIGN

Summarizing the comments of the experts and some reviews, we set up the questionnaire as follows:

1. Employee demographic information: gender, age, workplace information (work unit and organizational position), place of residence (province, city) and education
2. Investigating the impact of emotion on the relationship between mechanic and dynamic: In this section, we designed the questions in three parts: point, badge, and leaderboard, based on the 3 mechanics chosen by the experts. For each of the three sections, we received users' tendency to the selected dynamics of competition, cooperation, cheating, and completion in the form of a five-point Likert scale.
3. Investigating the effect of emotion on the relationship between dynamic and engagement: In this section, according to the four specified dynamics, we get users' opinions on the five-point Likert scale towards the dynamics and the impact they will have on their engagement.
4. Investigating the impact of emotion on the relationship between gamification competence and mechanic: To investigate this relationship we also asked for their opinion on the proposed mechanics in the form of a five-point Likert scale, provided that the organization's competence is high.

It is worth noting that in order to examine the impact of emotion (as shown in Fig 2), we performed sections 2 to 4 one time in normal conditions and another time by describing this issue to the employee assuming he or she has a good feeling of the organization and the work she/he is doing.

Prior to study participation, respondents were fully informed about the purpose of the study, and they were guaranteed about confidentiality of data and it was ensured that the responses were fully anonymized. They were notified that participation was voluntary and also they were assured of the right to withdraw from participation at any time without consequences and no need to providing reasons.

In the first section of the questionnaire, by checking the agree checkbox in response to the statement of: "I voluntarily participate in this questionnaire", all respondents indicated and recorded their consent to participate in the study.

V. RESULTS

The organization which selected as the case of the research has about 1,000 employees, with almost 20% of them are staff and 80% are in line. In order to get more general responses, we tried to distribute the questionnaires both in the line and in the headquarters, so that we could receive all personnel comments. We sent questionnaires to all bank employees through office automation. Considering the size of the community and using the Cochran formula [89] our sample size should be more than 278 and we tried to get more questionnaires. All responses were collected in August 2019 and finally we received 366 responses from employees.

Since employees usually do not have enough motivation to participate in surveys, in order to increase their motivation to engage in the surveys and questionnaires, we gamified the process by giving the chance to participants to win a gift card of 100,000 Tomans through draw tickets which they receive after participation. It is worth noting that no identifying information about the participants was collected at any point during the study, and their draw tickets were given anonymously.

Table 4 shows demographic data of the participants based on a percentage of the total sample population. We compared the results of the Table 4 with the actual statistics of the organization under study and concluded that sample population data represent a relatively diverse population that can be representative of the bank's employees.

The reliability of the survey was determined by Cronbach's alpha coefficient and it was equal to 0.751 for the proposed survey. The content validity of the survey was also assessed using the judgment of the experts and the comprehensive literature review; and to verify face validity, we used experimental implementation of it in a limited statistical population through which we compensated for ambiguities and deficiencies. We examined the results of the survey data and

TABLE 4. Demographic information.

Demographic characteristics			Category	Frequency	Percent
Age			18-24	3	1
			25-34	209	57
			35-44	142	38
			45-54	10	3
			Over 55	2	1
Gender			Female	153	42
			Male	213	58
Education			3rd grade middle school	13	3
			Diploma	21	6
			Undergraduate degree	238	65
			Graduate degree	79	22
			Ph.D.	15	4
Job information	Workplace		line	268	73
			staff	98	27
	Organizational position	Staff	Manager	6	2
			Deputy of Manager	15	4
			Senior Expert	9	2
			Expert	68	19
		Line	Branch Manager	37	10
			Deputy of branch	28	8
			Currency officer	31	8
			Facility officer	29	8
			Fund officer	18	5
			Operator	125	34

analyze the defined hypotheses. All analyses were conducted in SPSS 23.

We used Kolmogorov-Smirnov test to calculate the normality of the data and we used Wilcoxon Signed Ranks Test to compare the means due to the non-normal distribution and non-parametric nature of the data. In order to investigate the differences and the effect of positive emotion using Wilcoxon, we examined the data for null hypothesis testing. There was a significant difference between the mean groups; the results showed that in all cases the sig value was less than 0.05 and thus the null hypothesis was rejected and as a result there was a significant difference between the means of the groups. The results obtained after performing the Wilcoxon Signed Ranks Test are shown in Table 5.

Table 5 shows a comparison of the responses received from participants, in normal conditions and in the way they feel good about their organization and the work they are doing. To denote normal conditions we use the name mechanic or dynamic, and for the condition with positive emotion before the title, we have added the word "Emotion". For example, in the first row of the table, "Emotion_Point" refers to the responses received from the participants on the point mechanic when they have positive emotion toward their organization; which we compared that with the "Point", that is, participants' view of the point mechanic under normal conditions.

As shown in Table 5, Wilcoxon signed-ranks test revealed a statistically significant improvement with positive emotion and employees' good feeling in the system has a positive impact on their preference. In the next section, the results of the survey are analyzed in detail.

VI. DISCUSSION

Paying attention to human resources has become more important in contemporary organizations. Employee engagement is a major factor in increasing organizational productivity. In fact, organizations should come up with ideas for engaging their users by examining how people get motivated by games [90].

One of the newest technologies that can strengthen employee engagement in the organizations is gamification and hence, in recent years, enterprises have drawn attention to gamification technology to improve their performance.

The main purpose of this research is to theorize the use of gamification to increase employee engagement and for this purpose a proposed model is presented.

Our model highlight the strong interactions among three organizational capabilities in the form of mechanic options, dynamics and positive emotions.

It is derived from the MDE framework [15], which is one of the basic frameworks for enterprise gamification. The model also describe the important role of three processes (Capability-building, Behavioral change, evolutionary adaptation) in relation to these capabilities and development of employee engagement in the enterprise. Some of the important aspects of this conceptual model are: First, the gamification is considered as a technology that can use mechanic options to enhance the employee engagement in enterprises and improve the organizational performance. The proposed model demonstrates the importance of investment

TABLE 5. Results from Wilcoxon signed ranks test.

Hypothesis	Ranks		N	Mean Rank	Sum of Ranks
P1	(Emotion-Point) - (Point)	Negative Ranks	53[a]	153.43	8132.00
		Positive Ranks	285[b]	172.49	49159.00
		Ties	28[c]		
		Total	366		
	(Emotion-Badge) - (Badge)	Negative Ranks	49[d]	163.24	7999.00
		Positive Ranks	286[e]	168.81	48281.00
		Ties	31[f]		
		Total	366		
	(Emotion-LeaderBorad) - (LeaderBorad)	Negative Ranks	79[g]	146.00	11534.00
		Positive Ranks	264[h]	179.78	47462.00
		Ties	23[i]		
		Total	366		
P2	(Emotion-Competition) - (Competition)	Negative Ranks	48[j]	104.81	5031.00
		Positive Ranks	253[k]	159.76	40420.00
		Ties	65[l]		
		Total	366		
	(Emotion-Cooperation) - (Cooperation)	Negative Ranks	53[m]	93.82	4972.50
		Positive Ranks	247[n]	162.66	40177.50
		Ties	66[o]		
		Total	366		
	(Emotion-Cheating) - (Cheating)	Negative Ranks	40[p]	95.58	3823.00
		Positive Ranks	266[q]	162.21	43148.00
		Ties	60[r]		
		Total	366		
	(Emotion-Completion) - (Completion)	Negative Ranks	57[s]	94.66	5395.50
		Positive Ranks	266[t]	176.43	46930.50
		Ties	43[u]		
		Total	366		
P3	(Emotion-Competition) - (Competition)	Negative Ranks	70[v]	136.86	9580.50
		Positive Ranks	259[w]	172.60	44704.50
		Ties	37[x]		
		Total	366		
	(Emotion-Cooperation) - (Cooperation)	Negative Ranks	41[y]	123.12	5048.00
		Positive Ranks	296[z]	175.35	51905.00
		Ties	29[aa]		
		Total	366		
	(Emotion-Cheating) - (Cheating)	Negative Ranks	75[ab]	134.75	10106.00
		Positive Ranks	252[ac]	172.71	43522.00
		Ties	39[ad]		
		Total	366		

TABLE 5. ***(Continued.)*** **Results from Wilcoxon signed ranks test.**

	(Emotion-Completion) - (Completion)	Negative Ranks	62[ae]	146.22	9065.50
		Positive Ranks	279[af]	176.51	49245.50
		Ties	25[ag]		
		Total	366		

a. P1-Emotion-Point < P1-Point
b. P1-Emotion-Point > P1-Point
c. P1-Emotion-Point = P1-Point
d. P1-Emotion-Badge < P1-Badge
e. P1-Emotion-Badge > P1-Badge
f. P1-Emotion-Badge = P1-Badge
g. P1-Emotion-LeaderBorad < P1-LeaderBorad
h. P1-Emotion-LeaderBorad > P1-LeaderBorad
i. P1-Emotion-LeaderBorad = P1-LeaderBorad
j. P2-Emotion-Competition < P2-Competition
k. P2-Emotion-Competition > P2-Competition
l. P2-Emotion-Competition = P2-Competition
m. P2-Emotion-Cooperation < P2-Cooperation
n. P2-Emotion-Cooperation > P2-Cooperation
o. P2-Emotion-Cooperation = P2-Cooperation
p. P2-Emotion-Cheating < P2-Cheating
q. P2-Emotion-Cheating > P2-Cheating
r. P2-Emotion-Cheating = P2-Cheating
s. P2-Emotion-Completion < P2-Completion
t. P2-Emotion-Completion > P2-Completion
u. P2-Emotion-Completion = P2-Completion
v. P3-Emotion-Competition < P3-Competition
w. P3-Emotion-Competition > P3-Competition
x. P3-Emotion-Competition = P3-Competition
y. P3-Emotion-Cooperation < P3-Cooperation
z. P3-Emotion-Cooperation > P3-Cooperation
aa. P3-Emotion-Cooperation = P3-Cooperation
ab. P3-Emotion-Cheating < P3-Cheating
ac. P3-Emotion-Cheating > P3-Cheating
ad. P3-Emotion-Cheating = P3-Cheating
ae. P3-Emotion-Completion < P3-Completion
af. P3-Emotion-Completion > P3-Completion
ag. P3-Emotion-Completion = P3-Completion

on gamification as a mechanic options generator in the contemporary organization and highlights the role of gamification as a platform for enterprise capabilities in the form of mechanic options and dynamics.

Based on this model for evaluation of gamification in an enterprise (from the employee perspective) we should ask some questions:

At what level of gamification competence is the enterprise?

What kind of mechanics does gamification use?

What dynamics are generated by the mechanics in the enterprise?

How much positive emotions have been created in the enterprise's employee?

How much employee engagement has been added through the use of gamification?

Mechanic options, dynamics and positive emotions are basic elements that influence employee engagement and lead to increase capability of the enterprises in a competitive environment.

Second, our model represents an integrated view among gamification, employee engagement, enterprise performance and enterprise's capabilities in the form of mechanic options, dynamics and positive emotions. Creating positive emotions in the employees plays a key role to enable these capabilities and empowering the enterprise. In order to achieve better results in the enterprise performance, it is necessary to consider gamification, enterprise capabilities and employee engagement as an integrated concept.

Third, the concepts of gamification competence, mechanic options, dynamics, employee engagement and enterprise's performance have variable levels in enterprises. Therefore, gamification as a dynamic technology can also be evolving in the enterprise. Our model also demonstrates three processes of capability-building, behavioral change and evolutionary adaptation that reflect continuous changes of gamification in organizations. These processes also include organizational learning in gamification technology that means the changes in the rate and quality of employee engagement lead to changes in the other factors.

Fourth, gamification designers and executives need to pay attention to the mentioned concepts of the model for better use of gamification in the enterprise. In other words, game designers need to choose proper mechanic options according to the level of enterprise's gamification competence to achieve the employee engagement based on the creation of dynamics and positive emotions. Researchers in the field of organization and human resources need to make necessary studies on appropriate organizational and job structures for

using mechanic options in better performing of activities and achieving enterprise capability.

Finally, gamification as a technology like other technologies can be useful in organizations if the employees have suitable interactions with it in performing their activities. In fact this dynamic interactions form through changing behaviors and making positive emotions. In our model two main concepts of the behavioral change process as well as positive emotions play this important role. In the other words, these concepts help employees to enact dynamic structures of gamification-in-Practice [9]. Such use of gamification can lead to more employee engagement and organizational capability.

In this paper, we determined the factors of MDE framework and capability-building and behavioral change processes using the mixed method through expert interviews and questionnaires and we localized it for a 1,000-member banking organization. To this end, by analyzing the experts' opinions we obtained a list of factors of mechanic and dynamic according to the organization we had considered as a case. We selected the three most popular gamification mechanics, also known as PBL triad [22], [40], and four dynamics were selected including: Competition, cooperation, cheating, and completion. During the interviews, we focused on the dynamics chosen so as to give the user mechanics more pleasant experiences [15].

After summarizing the experts' opinions, we designed a questionnaire to obtain the opinions of the organization's employees, structured in four main sections: 1-demographic information of the employees 2-questions to evaluate the impact of emotion on the relationship between mechanics and dynamics 3-questions to evaluate the impact of emotion on the relationship between dynamics and engagement 4-questions to evaluate the impact of emotion on the relationship between mechanics and competence.

We then distributed the questionnaire throughout the organization and received 366 responses from approximately 1,000 employees. We used Wilcoxon Signed Ranks Test to analyze the data and the results revealed that positive emotions play a positive moderator role in the model that means a good sense of employees about the system has a positive impact on their preference.

In the literature, similar studies have often examined the impact of fun and engagement in a workplace [45], [56], [61], [91]. For examples, in [45], a model has been provided for improving workplace engagement by examining the added value of work engagement within organizations and beyond; and it has been shown that increasing employee engagement is a competitive advantage for organizations and it can enrich major areas in an employee's life. In a similar study, Karl *et al.* [62] examined the impact of fun at work on recruitment and retention and found that a fun workplace provides higher job satisfaction. Tews and Noe [39] have presented a conceptual model of fun and training effectiveness in which they examined the role of fun and engagement in workplace training; they analyzed the indirect impact of fun features on cognitive and skill-based outcomes and satisfaction using the proposed model.

From the JD-R model perspective, kwon and kim [16] have developed a model that examined the relationships between employee engagement and innovative behavior and they have shown that providing a mix of reasonably high demands and high resources to employees makes them more engaged and innovative. An important point in such models is that the components of the model should be examined in greater detail in future research; for example, more research is needed on various job resources over demands. Karamfilov [92] focused on the issue of idiosyncratic workplace fun as a new type of workplace fun and presented a model that examines the relationships between "leaders' endorsement of idiosyncratic workplace fun (LEIWF)", "organizational playfulness climate (OPC)", and "organizational creativity". He has shown that LEIWF and OPC neither relate significantly to organizational creativity nor predict it. It should be noted that, he attributed these unexpected results to things such as small sample size and lack of adequate financial resources and time.

Overall, by examining the existing literature, to the best of our knowledge, we did not find similar studies that examined positive emotion in the workplace from our perspective and point of view; however, there are studies in the literature that have examined the effects of positive emotion in different domains with other approaches.

Direner *et al.* [11] have presented a model that examines the relationship between positive emotions and positive outcomes through a series of mediating mechanisms (state-like resources and enduring resources). They also showed that targeting the organization to become a workplace that promotes positive emotions would bring many benefits to the organization. They have also acknowledged that positive emotion can enhance engagement in the workplace; in addition, they have provided useful discussions on positive emotions and exploring them in various ways.

Gloria and Steinhardt [83] have developed a model to examine the direct and mediating roles of positive emotions on work engagement among postdoctoral fellows. They showed that positive emotions were associated with employee engagement and fully mediated the relationship between supervisor support and engagement; so they recommended that stimulating positive emotions should be required to promote postdoc work engagement.

In a daily diary study, Ouweneel et al [12] have presented a model of daily positive emotions, hope, and work engagement that examines the relationships between positive emotion and work engagement. They have shown that employees are completely absorbed and engaged in their work through hope, and perform assigned tasks in the workplace dedicatedly and energetically; therefore, they acknowledged that positive emotion through hope had an indirect effect on the employee engagement. A circumplex framework is provided by Wright [43] that examines the various dimensions of positive emotions. In the review studies on organizational areas, the importance of positive emotions have

also been emphasized [13], [52]. Kaplan *et al.* [84] similarly in a meta-analytic investigation study showed that the presence of positive emotions is very important in performance improvement.

In similar gamification studies [15], [81], researchers also emphasized positive emotions and noted that in order to enrich the gamified systems literature a deeper understanding of emotional processes is needed. Kumar and Herger [6] have identified in their study the creation of positive emotions in players (indicating their positive experience) as the ultimate goal of gamified systems. In another similar study, Mullins and Sabherwal [2] also identified the success of the gamified systems in their ability to engage players by creating emotional experiences both positively and negatively. Meşe and Dursun [26] have also examined the effectiveness of gamification elements in terms of emotions and they have emphasized that designers need to design elements of gamification in a way that enhance individuals' positive emotions in order to increase the efficiency of gamified systems. Zatarain Cabada *et al.* [27] using machine learning approach and monitoring the affective state of individuals, have provided a learning environment that is capable of identifying and responding to students' emotions. In a similar study, Öhman *et al.* [44] have also provided a framework to gamified systems for emotion detection and sentiment analysis.

To sum up, the results of the studies show that other researchers also have examined the positive emotions and highlight their potential impact in different fields. The main difference of our study with others is that we have theorized a new approach to the role of gamification in enterprises from the employee perspective through the presentation of a nomological network model; and we have analyzed the relationship between the gamification competence and enterprise performance.

In the literature, to the best of our knowledge, there is no model which has been designed with a focus on enterprise and gamification approach based on MDE model. The model presented in our study is a new approach that for the first time examines the relationships between gamification competence and enterprise performance through "Capability-building processes", "Behavioral change process", and "Evolutionary adaptation process" based on the MDE model.

It is worth noting that in this study we investigated three hypotheses of P1, P2, and P3 of the proposed model and leave the investigation of other hypotheses to future studies. Totally, it is recommended that researchers use such methods as emotion detection and re-examine the impact of emotion on the proposed model of this study for the future research.

Generally, the proposed conceptual model can be the starting point for another set of researches in the field of enterprise gamification. Some future researches can be suggested as follows:

1- In this research we tried to theorize the role of gamification in the enterprises from the employee perspective. Future studies can theorize the role of gamification from the perspective of enterprise's customers.

2- In our model mechanic options and dynamics are generally considered. More exact conceptualization can be done on specific mechanic options and dynamics. For example, we can theorize the role of team-based or individual-based mechanic options on employees' collaboration or competition as dynamics.

3- Future researches can theorize the impact of gamification from the perspective of various organizational processes similar to managerial or operational processes.

4- We can assess how enterprises execute the capability-building and behavioral change processes with using three organizational capabilities in the form of mechanic options, dynamics and positive emotions. In other words, future researches can be done through empirically test of the proposed model and propositions in some enterprises.

VII. CONCLUSION

Gamification is a new topic that is considered by contemporary enterprises. Organizations can use gamification to make a lot of improvements in relationship with their customers and employees. Investing in this technology enables enterprises to achieve higher levels of capability by benefiting from suitable mechanic options in their processes.

In this article we present a theoretic model and related propositions that try to demonstrate the relation between gamification competence specially the investment level on the gamification and enterprise's performance from the employee perspective. In this model mechanic options, dynamics and positive emotions act as mediating concepts. At the same time, positive emotions is as a facilitating and activating factor for achieving enterprise's capability that play important role in creating dynamic structures of gamification-in-practice.

To evaluate the proposed model and design of a gamified system to increase employee engagement, we determined factors such as capability-building and behavioral change processes using the mixed method through expert interviews and questionnaires and we will run it for a 1,000-member banking organization. The results showed that positive emotions play a positive moderator role in the model. This indicates that employees' good feeling about workplace has a positive impact on their preference.

Future researches can modify and develop our conceptual model and identify more relationships among related concepts in this field.

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