Research on the influence of gamification on team performance

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Abstract

With the development of the Internet, the labor force of enterprises is getting younger, and there are problems such as low team performance and high turnover rate of employees. How to improve the enthusiasm of employees and the creativity of the team has become an important research topic. The effective application of gamification in enterprise management has also become the focus of many scholars. By means of experimental research, this study verified the effectiveness of gamification design elements in enhancing individual behavioral motivation and the internal influence mechanism on team performance. Two kinds of gamification design elements, role-playing and award, were selected as independent variables. The results showed that the two kinds of gamification design elements had significant influence on team performance.

Keywords

Gamification; Role-playing; Team performance; Award.

1. Introduction

Games can immerse individuals in them for a long time, and during this process, their attention is highly concentrated, which shows that video games have a strong level of motivation[1]. People hope to apply the huge motivational potential inherent in video games to reality.Gamification is the process of using gamified design elements in a non-game environment[2]. Gamification includes basic design elements such as PBL (points, badges, leaderboards), role and dynamics and mechanics. However, it is not the case that gamification elements will definitely achieve good results as long as they are involved. Different combinations of gamification design elements have different effects. Combing through the relevant literature of gaming, we found that most of scholars for the study of gamification at home and abroad in recent years based on the study, training, education, medical treatment, electronic games, and other fields. For group decision making and group internal relationship management research, it is difficult to provide effective data support,which can't give entrepreneurs and related practitioners given to guide rational decisions. In this paper, role-playing and award, two widely used gamification design elements, were selected as independent variables. Through design experiments, the influence of them on team performance was explored from the perspective of motivation, so as to provide ideas and theoretical basis for the improvement of team management and innovation ability of organization.

2. Literature review and research hypothesis

2.1 Gamification and gamification design elements

Gamification" first appeared in early 2010[1], Michael Sailer argue that it depends on four semantic components: game, element, design, and non-gamified context. Werbach says not all game design elements can be labeled as gamified in a non-gamified context. Only the use of each specific game design element is called gamification. Role-playing can occur as a single gamified design element or in combination with other elements.The improvement of individual immersion leads to the enhancement of team consciousness, and such relationships and emotions exist even without the role itself. Role-playing often endows individuals with specific roles based on a certain story background,

and applies the real relationship between objects and games through role behavior and gamification. In the process of role-playing, individuals, under the constraints of their roles, promote the development of the story together with other members of the team through certain behaviors to complete the final team tasks.The most direct way to ignore the potential of gamification is to pay too much attention to the reward mechanism[3]. If the reward itself becomes the ultimate goal of motivation, it will eventually become external motivation. The role of external motivation is limited. Some external rewards can be designed in the gamification system, but it must be clearly defined the use of rewards and matters needing attention. In fact, the internal pleasant experience brings much more effects than the external rewards.

2.2 The influence of role-playing of gamified design elements on team performance.

Domestic scholars Bin Zhang[4] on the basis of the team role theory, optimize the agriculture bank ZQ branch staff configuration study, through the reasonable configuration of team roles, team members with clear its role at the same time clear the role of the other members of the team, to understand how to maximum full play advantage, and effective communication can improve the performance of the team. According to Dr. Bebbins, a team is composed of a group of individuals who play roles understood by team members. New members must keep learning and try to adapt to their roles to better fit in. Through the division of roles, it helps each member to establish a sense of belonging and team identity, which can promote team consciousness and collective consciousness of members and improve team performance[5]. Jinfang Wang[6] took the executive team as the research object, and empirically studied the positive influence of the role of the executive team on the behavioral integration and the performance of the executive team at the team level. The role playing of gamified design elements combines the traditional team role theory with the role setting in games, which has practical significance for organization and management. In other words, role-playing of gamified design elements can promote team performance.

H1: role playing positively affects task performance.

H2: role playing positively affects contextual performance.

2.3 The influence of gamification design element reward on team performance

Reward is a common means of reinforcement in organizational management. Appropriate reward setting can positively influence individual behavior, which is embodied in its performance. Rewards can significantly improve individual performance. Material rewards exert effects on individuals through influencing their internal and external motivation, thus improving their behavioral performance[7]. A large number of scholars have confirmed the promotion effect of rewards on individual performance in earlier studies. Eisenberger et al. found in their study that performance reward and completion reward can significantly improve individual creativity and task performance, and there is a significant positive correlation between them[8].Rewards can also be applied at the team level. Through the reinforcement of team rewards, team performance will be positively affected[9]. Xiaohua Xu, taking the primary school teachers of Z primary school in L district of Shanghai as a case study, believes that the way of team rewards is conducive to improving the team performance of the group of primary school teachers. Through the form of team, the use of team rewards, so that the team members to deepen understanding, to gather people, team cooperation to overcome difficulties, so as to improve the competitiveness of the whole school. Team rewards are specifically distributed in the form of bonuses, which tie the interests of individuals and teams together. Individuals and teams are highly consistent and achieve win-win cooperation. He believes that team rewards have both advantages and disadvantages and should be applied according to specific situations.

H3: reward positively affects task performance.

H4: reward positively affects peripheral performance.

3. The research methods

3.1 Research object

Experimental studies are conducted in the laboratory to test the hypotheses. Through the comparison between the experimental group and the control group, the influence of award and role-playing design elements on the team's decision-making process can be more clearly seen. 2*2 experimental design was adopted in this study. Award and RP (role-playing) were independent variables, which were divided into two levels. The dependent variable is team performance: task performance and peripheral performance. The first-year students in a certain university were selected as experimental subjects. According to the needs of the task situation, 144 recruited experimental subjects were randomly divided into 48 three-person groups to participate in the experiment. In the whole process of the experiment, the incentive mechanism was set to fully ensure the enthusiasm of experimental subjects to participate in the experiment. Therefore, there was no relevant incentive setting outside the experiment.

3.2 Experimental design

The experimental task type selected in this study is the management decision preference type.

Stasser&Stewart(1992) describes the method of "hidden profile"[10] as follows: "in a hidden profile, there is an authoritative decision, but for each member of the team, the authoritative decision is hidden, because each member can only get part of the information supporting the authoritative decision. "Team members are not inclined to agree with the authoritative decision at the beginning of the discussion because they have limited information.Then they can discover this authoritative decision by collecting and sharing information of each member.The exploration of "hidden information" depends on the consideration of non-shared information in the discussion. If the team discussion focuses on the Shared information that already exists, it will affect whether the final decision is authoritative or not.

In the experiment, we set up an information packet for each of the three subjects, that is, a description of the five hypothetical candidates for the department assistant position. The participants read each of the five candidate packets individually. They then discussed with other members of a random three-person team which candidate would be better for the job. Each candidate's packet contains an information entry.The structure of a packet includes a certain number of positive, negative, and neutral information items. Positive information items are considered as important and favorable attributes to candidates, while neutral information items are unimportant or irrelevant attributes to candidates. The negative information item is considered an important but unfavorable attribute for the candidate.Task performance refers to the result of team members' completion of tasks, which is measured by quality, output and efficiency. In this experiment, we ranked five decisions (five candidates) according to the degree of authority.The gap between the ranking result of each team and the standard answer (geometric distance) was used to measure the task performance. The absolute value of each geometric distance is the score of each team, which is the task performance. Peripheral performance is a kind of interpersonal and volitional behavior of psychological and social relations. It focuses on the measurement of some quality characteristics related to work performance that organizational members have outside of their job duties.In this experiment, the subjects completed an evaluation questionnaire after the experiment.The subjects judged the descriptions in the questionnaire according to their own feelings, and the answers were scored with five points.

4. Research results

4.1 Descriptive data analysis

The RWG value of peripheral performance was 0.86, ICC(1) was 0.17, and ICC(2) was 0.76. The reliability test was carried out on the questionnaire data of seven variables. Through the data analysis, the Cronbacha coefficient of task innovation in this study was 0.780, the Cronbacha coefficient of

task learning was 0.808, and the Cronbacha coefficient of task performance was 0.795. The KMO value of peripheral performance is 0.871, p is less than 0.01.

4.2 Correlation analysis

After the validity test of the experimental data, bivariate correlation analysis was conducted to more intuitively analyze the relationship between the variables. Award and task performance showed a significant positive correlation (r=0.375,p<0.01). Hypothesis H3 was preliminarily verified. Role-playing has a significant positive correlation with task performance (r=0.409,p<0.01). Hypothesis 1 has been preliminarily verified. Role-playing has a significant positive correlation with peripheral performance (r=0.552,p<0.01). Hypothesis H2 has been preliminarily verified,see Table 1.

Table 1 Three Scheme comparing

	mean	SD	award	RP	Task performance	Peripher-al performance
Award	.50	.505	1	.000	.375**	-.371**
RP	.505	.505	.000	1	.409**	.552**
Task performance	3.83	1.326	.375**	. .409**	1	-.080
Peripheral performance	4.5585	.3259	-.371**	.552**	-.080	1

Through data analysis and processing, it can be seen that in the correlation analysis of reward and task performance and peripheral performance, reward and task performance are positively correlated. Task performance of the group with reward setting was significantly higher than that of the group without reward, hypothesis H3 was supported. There was a negative correlation between the reward and peripheral performance, that is, the peripheral performance of the group with reward setting was significantly lower than that of the group without reward, and the reward did not promote the improvement of peripheral performance of team members. Hypothesis H4 was not supported. In the correlation analysis of role-playing as a design element with task performance and peripheral performance, data results show that RP is positively correlated with task performance and peripheral performance. Task performance and peripheral performance of the group with RP setting are significantly greater than those of the group without RP setting. Therefore, hypothesis H1 and H2 can be considered to be verified.

Data analysis shows that there is no significant positive correlation between gamification design element award and peripheral performance. The null hypothesis has not been proved. Material rewards from the outside contain more controlling information than the information of competence, leading to the external motivation of the individual is greater than the internal motivation, the individual simply to get the reward to complete the task and one-sided view of the problem, so as to make non-optimal decisions that affect the final performance score. It can be seen that in the reward mechanism, the way and time of the reward will affect the final incentive effect.

5. Conclusion

5.1 Main Conclusions

Based on previous research results, this study studied the influence of award and role-playing on team performance through literature review, experiments, questionnaires and other methods. The main conclusions are as follows:(1) there is a positive correlation between the award of drama design element and task performance.(2) gamification design element RP is positively correlated with task performance and peripheral performance. Role playing can significantly improve task performance and peripheral performance.In the process of team to complete the task can set appropriate rewards link, can improve the team members in the process of communication, learning, innovation, initiative, role - playing the game design elements as possible into the team process, as far as possible let each team member and role of fusion, the less as far as possible under the influence of external stimulus (material rewards), rational make optimal decisions.

5.2 Management suggestion

In the process of team to complete the task can set appropriate rewards link, can improve the team members in the process of communication, learning, innovation, initiative, role - playing the game design elements as possible into the team process, as far as possible let each team member and role of fusion, the less as far as possible under the influence of external stimulus (material rewards), rational make optimal decisions.

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