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Extended Abstract

# How to Promote Learning Behavior? Exploring the Role of Gamification in Mobile Learning Apps from the Perspective of Affordance

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**Abstract:** With the rapid popularization of mobile network, various gamification elements have been widely used in many mobile learning apps. However, there is no complete model to explain the actual effect of these gamification elements on promoting user learning behavior. This paper analyzes the effects of two types of gamification affordance elements on user learning behavior in mobile learning apps based on affordance theory and combines with an elaboration likelihood model. The datas are collected and analyzed from 23641 Shanbay Word users. The result shows that achievement visualization affordance and competition affordance affect users learning behavior negatively, user learning intention plays a mediating role between achievement visualization affordance, competition affordance and user learning behavior, team learning climate plays a moderating role between user learning intention, achievement visualization affordance and competition affordance.

Keywords:gamification, affordance theory, mobile learning

## 1. INTRODUCTION

In the field of education, the combination of games and learning are always a hot research topic. Many studies have shown that incorporating gamification elements into the learning process can help learners cultivate their interest, improving their participation and learning efficiency<sup>[1]</sup>. Gamification element combines with information technology are widely used in the design of mobile learning platforms (such as points, badges, leaderboards, PBL for short). But existing gamification research mostly focused on single gamification element. Few research considered categorizing gamification in terms of user interaction with the system. In recent years, gamification research has begun to explore the influence of gamification elements on user behavior from the perspective of affordance. Gamification promotes a series of psychological outcomes in users through their voluntary interaction with the system and its affordance, such as enhanced motivation and engagement, with the ultimate goal of shaping the users' participation behavior<sup>[2]</sup>. Existing studies still lack detailed analysis on how the relationship between users and gamification technical features in mobile learning apps affect users' participation behaviors. Affordance provides a good theoretical explanation to explain whether and how information technology functions affect users behavior. Our research question asks: How does gamification affordance affect user engagement behavior?

## 2. THEORETICAL FOUNDATIONS AND HYPOTHESIS

Gamification is the use of game design elements in non-gaming environments to improve user experience and user engagement<sup>[3]</sup>. Affordance can be understood as the behavioral possibility of a technical object to satisfy the relevant needs of the user in a specific situation<sup>[4]</sup>. Gamification affordance refers to users' perception of the possibility of completing a behavior or function by using a gamified information system. In mobile learning platform, achievement visualization affordance and competition affordance can be regarded as typical user-user interaction and user-system interaction under gamification affordance. We evaluate the effects of achievement visualization affordance and competition affordance impact on user learning behavior and the

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mediating effect of user learning intention and the moderating effect of team learning climate.

### 3. RESEARCH METHODOLOGY AND RESULTS

This paper crawls data set through houyi collector, covering 23641 users behavior in within 9 weeks, and integrates it into panel data according to the level of each user week. The results show that the achievement visualization affordance is negatively correlated with user learning intention ( $\beta=-0.288$ ,  $P<0.001$ ), and competitive affordance is negatively correlated with user learning intention ( $\beta=-0.307$ ,  $P<0.001$ ), assuming that H1 and H2 are true. The user learning intention will positively affect the user learning behavior in mobile learning apps ( $\beta=0.284$ ,  $P<0.001$ ) proposed by H3 are also verified. It is found that the effect of user learning intention on user learning behavior is  $\beta=0.145$  ( $p<0.001$ ) and the positive effect of user learning intention on user learning behavior is  $\beta=0.286$  ( $p<0.001$ ), thus H4 and H5 holds. The results show that there is significant positive relationship between the interaction term of achievement visualization affordance and team learning climate ( $\beta=0.061$ ,  $p<0.001$ ). Therefore, the team learning climate enhances the negative impact of achievement visualization affordance on user learning intention, that is, H6 is established. The results show that the interaction terms between team learning climate and competitive affordance are significant and positive ( $\beta=0.191$ ,  $P<0.001$ ). It can be preliminarily confirm that the moderating variable team learning climate has a moderating effect on competitive affordance and user learning intention, that is, H7 is established.

### 4. CONCLUSION AND DISCUSSION

All of these findings are of great significance both in theory and in practice. These findings have important theoretical and practical implications. Theoretically, we examine the impact of gamification affordance on users learning behaviour in order to better understand what motivates users to engage. From a managerial perspective, this study provides recommendations for mobile learning apps designers on the selection of gamification elements, corresponding to badges and leaderboards that should be used more selectively and in a more selective manner. Furthermore, this paper only researches two types of gamification affordance. Therefore, in the subsequent research, the theoretical paper of gamification affordance can be expanded to discover more gamification elements that have an impact on the continuous use of mobile learning apps users.

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