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# Organizational Learning in IT Companies: The Importance of Gamification and Knowledge Creation

**Desman Hidayat[1*], Edi Abdurachman[2], Elidjen[2], Yanthi Hutagaol[3]**

[1] BINUS Entrepreneurship Center, Management Department, Bina Nusantara University, Jakarta, Indonesia 11480

[2] Management Department, BINUS Business School Doctor of Research in Management, Bina Nusantara University, Jakarta, Indonesia 11480

[3] International Accounting & Finance Program, Accounting Department, Faculty of Economics & Communication, Bina Nusantara University, Jakarta, Indonesia 11480

*d4906@binus.ac.id

**ABSTRACT**

This study examines the impact of gamification and Knowledge Creation (KC) towards organizational learning. Organizational Learning (OL) is believed to be an essential factor that information technology (IT) companies need to be concerned with to sustain. Gamification can raise the employees' motivation to learn by making the learning process fun, while knowledge is the foundation of learning that consists of the interaction between tacit and explicit knowledge. This study used five-point scale Likert survey questionnaire to collect data from 60 medium-large Indonesian IT companies with a minimum ten years of establishment. The questionnaire was distributed from September 2020 to November 2020. The data were analyzed by Structural Equation Modelling (SEM) using SmartPLS. The results show that gamification has a positive effect towards OL and KC, KC positively affects OL, and KC is also mediating the relationship between gamification and OL. The findings of this study suggest that Indonesian IT companies should increase KC in their companies and implement gamification to raise the motivation of the employee to learn. This study contributes to the literature by having an empirical research on how gamification can be effective to use in companies and the importance of KC as a mediating factor.

**Keywords**
Gamification, Knowledge Creation, Organizational Learning, SEM, SECI

## Introduction

Organizational learning has been known as an important factor in helping companies to be sustain (Hermelingmeier & von Wirth, 2021; Jain & Moreno, 2015). In information technology (IT) industry, changes are rapid and the condition is uncertain (Kaivo-oja & Lauraeus, 2018). Industry 4.0 makes organizational learning even more important to cope with technological changes (Belinski et al., 2020). Therefore, IT companies must use organizational learning to adapt fast to the changes and raise their performance.

Indonesia is one of the emerging countries that have rising IT companies. Even though pandemic situation has affected industries, Indonesia's digital economy is still raised 11% from 2019 to 2020 (Google; et al., 2020). Information and communication industries are currently the fifth biggest GDP producer industries in Indonesia (Bank Indonesia, 2020). While most countries that focus on IT have significant GDP produced by IT companies, Indonesia still has a long way to focus on developing IT companies.

As the industry that relies a lot on information, knowledge is essential for IT industry (Nazari et al., 2020). Knowledge creation that expressed the interaction between tacit and explicit knowledge can help companies to learn and innovate (Nonaka & Peltokorpi, 2006; Vick et al., 2013). Previous studies also showed that knowledge creation proved to be an important factor in affecting organizational learning (Celemín-Pedroche et al., 2020; Rezaei et al., 2018). To facilitate organizational learning, gamification can be an effective solution to improve how employees are engaged and motivated. Moreover, prior studies shows that gamification can increase the motivation of the employees (Friedrich et al., 2019; Suh & Wagner, 2017). Despite these studies, little research has conducted to examine the role of gamification to improve organizational

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learning, primarily through knowledge creation. This paper aims to analyze the relationship between gamification, knowledge creation, and organizational learning.

## Literature Review

### Knowledge Creation and Organizational Learning

To improve the company's performance, knowledge has been one of the critical factors (Aliyu et al., 2015). Various countries and industries study the relationship between knowledge creation and firm performance (Hidayat et al., 2020). IT companies with high turnover rates will need to manage knowledge creation better to perform well (Song, 2017).

The knowledge-based view of the firm (KBV) is the most common theory used as the foundation to understand knowledge creation theory (Hidayat et al., 2020). KBV considered knowledge as one of the most critical assets in the company(Grant, 1996). This view is derived further from the dynamic capabilities theory that manages knowledge, external resources, and complementary strategic assets (Curado, 2006).

Socialization, Externalization, Combination, and Internalization (SECI) is a way to explain the knowledge creation process (Nonaka et al., 2000). SECI describes the interaction between tacit and explicit knowledge (Muthuveloo et al., 2017). Socialization converts tacit to new tacit knowledge; externalization converts tacit to explicit knowledge; combination converts explicit to explicit knowledge, while internalization converts explicit to tacit knowledge (Lee & Choi, 2003).

Organizational learning has been an essential part of helping companies improve their future performance (Weinzimmer & Esken, 2017). Organizational learning, especially higher-level learning, is relevant to strategic management because it will impact a company's long-term survival (Fiol & Lyles, 1985). In the era of the industrial revolution 4, companies that foster learning at the organizational level can give them better technology adoption, which raises company performance (Tortorella et al., 2020).

Organizational learning is a dynamic process that combines exploring new learning and exploiting what has already been learned (Crossan et al., 1999). This process happens over time and across levels. The organizational learning theory derives from the knowledge-based view of the firm (Curado, 2006). The organization is conceptualized as culture and should learn through activities related to cultural artifacts.

This study used four indicators to measure organizational learning: knowledge acquisition, information distribution, information interpretation, and organizational memory (Cegarra-Navarro et al., 2007; Huber, 1991). Previous information technology-related researches have used these indicators (Cegarra-Navarro et al., 2007). Knowledge acquisition explains how knowledge is obtained; information distribution explains how information is shared and transformed into new information; information interpretation explains the process where distributed information is given one or more interpretations, while organizational memory explains how the knowledge is stored (Huber, 1991).

Several studies have researched knowledge creation and proved to have a positive and significant effect on organizational learning (Ramírez et al., 2011; Rezaei et al., 2018). Organization needs to create new products and services by transforming their knowledge through learning (Rezaei et al., 2018). Both of the variables contribute to the success of the company (Ramírez et al., 2011). This study explores how knowledge creation impacted organizational learning in IT companies.

***H1:*** *Knowledge Creation will be positively related to Organizational Learning.*

### Gamification and Organizational Learning

Gamification is proved to positively affect cognitive, motivational, and behavioral learning outcomes (Sailer & Homner, 2020). It is also

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proved to show high perceived motivation and high usability for users (Shi & Cristea, 2016). Therefore, gamification is an effective way to help companies in giving instructions (Sailer & Homner, 2020).

The motivational factor of gamification derives from self-determination theory (Mitchell et al., 2020; van Roy & Zaman, 2018). Self-determination theory divided motivation into three types: amotivation, extrinsic motivation, and intrinsic motivation (Ryan & Deci, 2000). Gamification tries to create learners' intrinsic motivation by providing immediate feedback and control over the material, also inspiring curiosity (Brull & Finlayson, 2016).

Gamification defines as a process of enhancing services with motivational affordances (Hamari & Koivisto, 2015). This study used six indicators to measure gamification: usefulness, ease of use, enjoyment, playfulness, recognition, and social influence. These indicators are the extension of three dimensions used in gamification: utilitarian, hedonic, and social (Hamari & Koivisto, 2015).

Previous study showed that gamification positively relates to the topic of learning (Sailer & Homner, 2020). Using specific game design elements may affects specific psychological needs on how people learn (Sailer & Homner, 2020). But there is also study that showed how gamification gave less motivation on learning (Hanus & Fox, 2015). This study will try to enrich the theoretical view of the relationship between gamification and learning. Many studies have been researched in the classroom context. This study, however, will look at how gamification is related to organizational learning in IT companies.

***H2:*** *Gamification will be positively related to Organizational Learning.*

### Gamification and Knowledge Creation

One of the barriers to knowledge creation is the lack of employees' motivation (Swacha, 2015). Therefore, gamification can be useful to increase motivation. It is argued that gamification can help in the practice of knowledge sharing (Singhsomransukh & Heo, 2017). Although gamification is argued to be related with knowledge creation, but more empirical research should be done to prove this notion. This study will try to prove the relation between gamification and knowledge creation.

***H3:*** *Gamification will be positively related to Knowledge Creation.*

The research model can be seen in Figure 1.

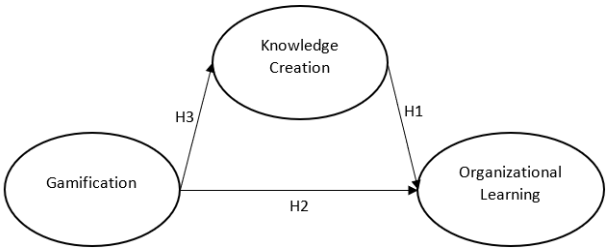


**Figure 1.** Research Model

## Methods

The samples for this study are 60 medium-large information technology (IT) companies located in Indonesia and has been established for a minimum of 10 years to ensure that they can sustain within these years. The definition of medium companies according to Indonesian Micro, Small, and Medium Enterprise Regulation No.20 Year 2008 are the companies that have 2,5 billion – 50 billion IDR per year (178 thousand – 3.5 million USD) while large companies are the ones that have more than 50 billion IDR per year (3.5 million USD). The observation unit for this study is one managerial level employee that can represent the company.

This study classified the respondents into several characteristics: (a) Company age since established, and (b) Number of employees. Based on the result, 37% of respondent companies established for 10-14 years, 18% of the companies have been established for 15-19 years, while most respondent companies have been established for at least 20 years. Most of the companies (23%) have around 11-50 employees, while the smallest percentage (2%) is the company that has <10 employees. This result showed that being medium-large companies does not mean that they

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must own many employees, especially IT companies. Details of the respondents' characteristics can be seen on Table 1.

**Table 1.** Respondents' Characteristics

| **A. Company Age Since Established** | | |
|---|---|---|
| **Company Age Since Established** | **Frequency** | **Percentage** |
| 10-14 years | 22 | 37% |
| 15-19 years | 11 | 18% |
| >=20 years | 27 | 45% |
| TOTAL | 60 | 100% |
| **B. Number of Employees** | | |
| **Number of Employees** | **Frequency** | **Percentage** |
| >500 employees | 4 | 7% |
| 201-500 employees | 5 | 8% |
| 51-200 employees | 9 | 15% |
| 11-50 employees | 14 | 23% |
| <10 employees | 1 | 2% |
| TOTAL | 60 | 100% |

This study's method is exploratory research by using PLS-SEM that is suitable for research that has little or no prior knowledge of the variable relationship (Hair Jr et al., 2017). Data analysis is done by using SmartPLS. The questionnaire used for this study used a Likert five-point scale. The scale ranged from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was distributed from September 2020 to November 2020. Descriptive analysis result has been done to three variables, with a total of 26 question items.

## Results

The validity test that was done by SmartPLS removed all the items that have <0.70 outer loading score (Hair Jr et al., 2017). Based on the validity result, all the variables are valid. The results can be seen in Table 2.

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**Table 2.** Respondents' Characteristics

| Variables | Indicators | Items | Outer Loading | Validity |
|---|---|---|---|---|
| Gamification | Recognition | GA11 | 0.757 | Valid |
| | | GA12 | 0.793 | Valid |
| | | GA13 | 0.787 | Valid |
| | Social Influence | GA21 | 0.853 | Valid |
| | | GA22 | 0.830 | Valid |
| | Enjoyment | GA31 | 0.894 | Valid |
| | | GA32 | 0.811 | Valid |
| | Playfulness | GA41 | 0.861 | Valid |
| | | GA42 | 0.914 | Valid |
| | Recognition | GA51 | 0.770 | Valid |
| | | GA52 | 0.828 | Valid |
| | Social Influence | GA61 | 0.759 | Valid |
| | | GA62 | 0.745 | Valid |
| Knowledge Creation | Socialization | KC11 | 0.773 | Valid |
| | | KC12 | 0.723 | Valid |
| | Externalization | KC22 | 0.755 | Valid |
| | | KC23 | 0.728 | Valid |
| | Combination | KC32 | 0.737 | Valid |
| | | KC33 | 0.859 | Valid |
| | Internalization | KC41 | 0.802 | Valid |
| | | KC42 | 0.840 | Valid |
| Organizational Learning | Knowledge Acquisition | OL12 | 0.764 | Valid |
| | Information Distribution | OL21 | 0.760 | Valid |
| | | OL23 | 0.820 | Valid |
| | Information interpretation | OL32 | 0.747 | Valid |
| | Organizational Memory | OL41 | 0.814 | Valid |
| | | OL42 | 0.846 | Valid |
| | | OL45 | 0.839 | Valid |

The reliability test uses Cronbach Alpha, Average Variance Extracted (AVE), and composite reliability (CR). In order to be reliable, Cronbach Alpha should be >0.6, AVE>0.5, and CR >0.6 (Hair Jr et al., 2017). Based on those aspects, all the variables used in this study are reliable. The result of the reliability test can be seen in Table 3.

**Table 3.** Reliability Test result

| Variables | Cronbach's Alpha | CR | AVE | Reliability |
|---|---|---|---|---|
| Gamification | 0.958 | 0.963 | 0.668 | Reliable |
| Knowledge Creation | 0.907 | 0.925 | 0.606 | Reliable |
| Organizational Learning | 0.905 | 0.925 | 0.639 | Reliable |

After proven to be valid and reliable, variables were tested by structural equation modeling (SEM) to examine the path coefficient and t-values of the hypothesis. To be significant, a relationship should have t-statistic value >1.96 and p-value <0.050 for 95% confidence level. The result can be seen in Table 4.

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**Table 4.** SEM Test result

| Relationship | Path Coef. | T-Stat | Sig. (P-Value < 0.050) |
|---|---|---|---|
| Gamification-> Knowledge Creation | 0.660 | 9.204 | 0.000* |
| Gamification-> Organizational Learning | 0.340 | 2.961 | 0.003* |
| Knowledge Creation-> Organizational Learning | 0.582 | 5.752 | 0.000* |
| Gamification -> Knowledge Creation -> Organizational Learning | 0.384 | 4.685 | 0.000* |

*Significant

Figure 2 shows the result of the hypothesis.

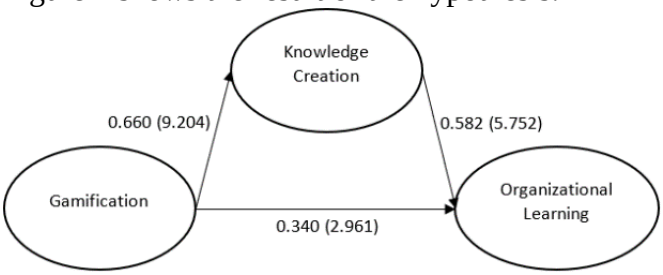


**Figure 2.** Research Model with Path Coefficient and T-Value

## Discussions

The results show a positive relationship between Knowledge Creation and Organizational Learning that support Hypothesis 1. This result supported the arguments on other studies that showed how Knowledge Creation has positive effects on Organizational Learning (Brix, 2017; Ramírez et al., 2011; Rezaei et al., 2018). Knowledge has been known as one of the most important intangible assets for companies (Ramírez et al., 2011). Therefore, IT companies' leaders should create knowledge creation culture in their company by using not only their own knowledge, but more importantly the team's knowledge (Brix, 2017; Rezaei et al., 2018).

Gamification positively related to Organizational Learning based on hypothesis 2. This study gave an empirical result in IT companies that improved results from other research that describe their relationship in the education field (Hanus & Fox, 2015; Sailer & Homner, 2020; Singhsomransukh & Heo, 2017). Therefore, hypothesis 2 is supported. This result implies that IT companies should implement gamification in their organizational learning system. Moreover, creating collaborative environment can help gamification to become more effective in organizational learning (Sailer & Homner, 2020).

Hypothesis 3 argued that Gamification positively related to Knowledge Creation. This study also gave an empirical result in IT companies that improved results from other research on the relationship in the conceptual level (Singhsomransukh & Heo, 2017; Swacha, 2015). Therefore, hypothesis 3 is supported. IT companies can implement gamification from a mechanism to a complex learning management system (Swacha, 2015). Whichever that they use, it will still be effective if the company can balance the award well enough in the gamification system.

This study also compared Gamification's direct effect on Organizational Learning with Gamification's indirect effect on Organizational Learning mediated by Knowledge Creation. The result showed that the direct effect's path coefficient (0.340) is smaller than the path coefficient of the indirect effect (0.384). Therefore, this study proved that Knowledge Creation mediates the relationship between Gamification and Organizational Learning. But the differences in the result of direct and indirect effect are not trivial, so it also showed that both relationships are equally important to organizational learning.

Gamification is a new trend in business, primarily related to marketing and strategic human resource management. It used the game elements in a non-game context (Deterding et al., 2011). It is an effective way to increase motivation. IT companies in Indonesia can use Gamification to increase their employees' motivation to increase

Knowledge Creation and Organizational Learning in their companies. Knowledge Creation in this context is an important part that needs to be considered. Having good Knowledge Creation and Gamification will help the companies to reach their Organizational Learning.

## Conclusion

The way companies learned has been researched more lately to understand how companies survived the competition, especially in VUCA and pandemic situations. Many studies have mentioned how gamification is vital to learning. This study showed how gamification could be useful for organizational learning. Knowledge creation is also an essential factor for organizations to learn, especially for IT companies. This study showed that the gamification effect towards organizational learning would be more effective by having knowledge creation.

## Limitations and Future Studies

This study is limited to the quantitative approach. It is also still using gamification more on the motivational side instead of testing by using a program. The respondents are also limited to the long-established IT company in Indonesia.

Future research can use qualitative or mixed-method approaches. Creating a program or application to test the gamification deeper can also enrich this study. Lastly, testing the research on other industries can also strengthen the benefit of this research.

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