

The influence of game-based learning on business literacy

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Abstract

Game-based learning used in various learning areas, including business learning. MonsoonSIM is a game simulator employed in a business learning process. This study aims to investigate the influence of game-based learning using MonsoonSIM on business literacy and its effect on entrepreneurial intention. The population in this study are the students in the Special Region of Yogyakarta. Convenience sampling was used to select the research sample with the criteria of having experience of running MonsoonSIM. This study was conducted in 2022 based on a questionnaire to 121 students. In the analysis, Partial Least Square (PLS) was used with the results of game-based learning having a positive influence on business literacy, and entrepreneurial motivation having a positive influence on entrepreneurial intention. However, this study has not succeeded in proving the influence of environmental factors and business literacy on entrepreneurial intention. The study findings are expected to be a recommendation for higher education to apply game as a model alternative of business learning for a digital generation as it has been proven to promote business literacy.

Introduction

Playing games is a fun activity and a kind of entertainment for most people. Especially for young people - known as digital natives, they are so familiar with the activity. By definition, a game is an interactive game activity that has an achievement target and interaction among players (both between partners and between opponents) to run the activity (Krath et al., 2021).

In the beginning, the creation of games served as entertainment. Then, as time passed, games have passed through developments, one of which is games have become one of the learning media in the areas of education, business, medicine, politics, and military (Joella et al., 2020). Game-based learning is one of the learning methods that has started to develop by combining learning methods and industry areas. The use of games as a learning tool is based on the current fact that the latest learners are a digital generation with a new profile that differs from earlier learners. Due to this fact, an attractive learning tool is highly needed to keep them motivated and actively get involved in the learning process.

The use of game-based learning is one of the learning methods that provide virtual experiences based on problems existing in real life. Burhanudin et al. (2021) stated that this kind of learning method has succeeded in increasing motivation to learn. This is because game-based learning can create emotional, intellectual, and psycho-motoric stimuli for players. Types of games are adjusted and designed to help understand materials assisted with virtual world simulation adapted to conditions in real life. In consequence, players are accustomed to/trained to focus on the target set within the given time limit and be able to make the decisions needed. In the long run, the ability to focus and make decisions will be likely to have an effect in the work world someday.

Learning using games provides different learning experiences compared with the conventional learning process. In games-based learning, participants interact with each other

within one team or interact with other teams, thus building some competence either hard skill or soft skill. In relation to business training in high education scope, through games, students have experiential learning by running a business virtually. In this case, they design strategies, run the strategies, analyze data, make decisions, and also evaluate the strategies being implemented. The game simulator that can be used for business learning is MonsoonSIM. It is a business simulator and a platform for game-based learning with a lecturer as the facilitator in the learning process (MonsoonSIM, 2022). By running the simulator, it is expected that students understand business concepts. It is in line with Lim and Rubasundram (2018) stating that a learning process using game-based learning enables a clear explanation of a series of business processes.

A few studies have been conducted on game-based learning. Azisah et al. (2021) and Joella et al. (2020) found that game-based learning could create a learning environment that motivates, is fun, and enhances creativity. Hwang and Cruthirds, (2017) stated that the use of game simulators could increase users' knowledge and attitudes. In relation to the business topic, Burhanudin et al. (2021) revealed that game-based learning could improve concentration in learning business processes so that it would be likely to have an effect on the ability to think creatively, cooperate, and expertise in entrepreneurship.

The intention to continue using electronic applications is directly by the perceived usefulness and satisfaction, and then the satisfaction was affected by the confirmation and perceived usefulness (Kholid et al. 2018). Studies by Agusmiati and Wahyudin (2018) and Putu et al. (2016) stated that environmental factors had a positive influence on entrepreneurial intention, and these studies revealed that the most influential factor was the family factor. Agusmiati and Wahyudin (2018), Elfandi et al. (2021), Wirananda et al. (2016) and Yaghoubi Farani et al. (2017) found that entrepreneurial motivation had a positive influence on entrepreneurial intention. Burhanudin et al. (2021), Yi and Duval-Couetil (2021) found that increased knowledge of entrepreneurship would boost concentration in learning business processes, emotional intelligence, and generic ability. This is aligned with Elfandi et al. (2021) revealing that a positive influence was found in the relation between business literacy and entrepreneurial intention. In contrast, Farani et al. (2017) found that entrepreneurship knowledge did not have a positive influence on entrepreneurial intention.

Entrepreneurship is a subject that must be taken in all study programs with the aim of providing business understanding to students. Therefore, an interesting entrepreneurship learning method is needed so as to encourage student intentions to be entrepreneurs. Two factors have spurred this very research study - the importance of entrepreneurship learning models that are suitable for the digital generation and limited prior studies investigating games as a learning tool. The objective of this study is to prove the influence of game-based learning on business literacy, and the influence of motivation to be entrepreneurs, environmental factors, and business literacy on entrepreneurial intention. This study is different from research that has been done before, because it examines the benefits of game-based learning which has not been widely used for the learning process in higher education. The study findings are expected to make a contribution to educational institutions in improving students' business literacy by using attractive learning methods that fit the digital generation.

Literature Review

Game is a structured form of play with the purpose of entertainment. As time passes by, games are then used in non-game areas as said by Deterding et al. (2011) that gamification is the use of game elements in non-game contexts. In addition, gamification is the use of games based on mechanics and aesthetics employing game notions to learn particular fields. It is closely related to concepts of serious games and game-based learning (Krath et al., 2021). Serious games are games designed for certain purposes, not merely for fun, while game-based learning aims to achieve learning outcomes through game content used for education. Researchers agreed that games could increase analytical

skills, problem-solving skills, help understand concepts, and serve as a medium to practice things that have been learned in class (Vos & Brennan, 2010). Furthermore, Vos and Brennan (2010) stated that learning using games would make it effective for participants to learn concepts, develop skills, and gain positive learning experiences compared with learning through textbooks.

Now, educators can use a gamification platform called MonsoonSIM. It changes a learning model from only remembering, to practicing, exploring, and experimenting in a learning process (MonsoonSIM, n.d.). In relation to business learning, MonsoonSIM is an ERP-based business game that aims to provide users with learning experiences in an enjoyable way. By running the game platform, users will learn to understand the relatedness of all departments involved when managing a company business, such as maintenance, human resources, customer service, planning, forecasting, MRP, production, finance, wholesale, procurement, retail sales, marketing, logistics, warehouse, e-commerce (MonsoonSIM, 2022). In practice, users will be placed in groups to run a business virtually and will compete with other companies as in real life. Each team generally consists of 5 participants serving as managers who undertake their responsibilities. Furthermore, the teams will control all departments in the company, analyze various scenarios, adapt to quick changes, and select strategies to achieve the targets set. In managing a business, businessmen should complete a variety of tasks in order that the business run well. Therefore, an understanding of business is highly needed to enhance motivation to do entrepreneurship.

Game-Based Learning on Students' Business Literacy

This study is based on theory of planned behavior (Ajzen, 2012), which describes a conceptual framework for behavior. This theory explains that intention is determined by three factors: (1) Behavior belief, explained that the evaluation of behavior is based on belief (2) Normative beliefs, explained that belief factors arise based on the expectations of family and friends, (3) Control beliefs, namely beliefs that support or inhibit the behavior to be performed. The intention to entrepreneurship is influenced by behavioral belief, normative belief, and control belief. Behavioral belief is the belief or view that being an entrepreneur is a positive or negative profession; a normative belief is that behavior is affected by expectations and hopes of family, friends, or people surrounding; and a control belief is the belief of self-ability which support or inhibit behavior. This is as stated in the theory of planned behavior (Ajzen, 2012). Hypotheses development game-based learning is a method that can create a learning environment that motivates, is enjoyable, and boosts creativity (Joella et al., 2020). Games Based Learning as an effective learning tool for Economics Education (Platz, 2022). Specifically, a game-based business simulation platform can be a medium or a learning aid in understanding a business process. In running MonsoonSIM, it is expected that the participants are able to understand better the business concepts through running a business virtually thus increasing business literacy. Ellahi et al. (2016), Tavares (2022), Wardoyo et al. (2021) proved that Games Based Learning tools positively influences learning achievement. Burhanudin et al. (2021), Hwang and Cruthirds (2017) stated that the use of game simulation could increase users' knowledge and attitudes, Musselman (2014) demonstrates connections between gaming and literacy.

H1: Game-based learning has a positive influence on students' business literacy.

Environment on Entrepreneurial Intention

The theory of planned behavior stated that intentions are influenced by normative beliefs that come from the expectations of family and friends (Ajzen, 2012). Wijayanti and Suryani (2016) stated that the environment could develop entrepreneurial minds and abilities. In addition, Solesvik et al. (2012) asserted that attitudes and behavior are affected by normative belief which has an influence on the control of one's behavior and character. Thus, one's view of expectations and hopes originate from influential people in one's life. The higher the influence related to

entrepreneurship, will be likely to enhance one's interest and thought to do entrepreneurial activities. Wijayanti and Suryani (2016) revealed that family context had a positive influence on entrepreneurial intention. It is strengthened by subsequent research that the factor of family environment had a positive influence on entrepreneurship in an individual (Agusmiati & Wahyudin, 2018; Farani et al., 2017; Ibrahim & Mas'ud, 2016; Wardana et al., 2021) .

H2: Environment has a positive influence on entrepreneurial intention.

Motivation on Entrepreneurial Intention

The Planned of Behavior Theory stated that intentions also influenced by behavioral beliefs, the stronger the intention to perform the behavior, the more likely the behavior will be performed (Ajzen, 2012). According to Yi and Duval-Couetil (2021), entrepreneurial motivation refers to reasons and intentions that encourage an individual to be an entrepreneur. Motivation itself might affect the thoughts and minds of an entrepreneur. One's beliefs will influence behavior to do activities (Ajzen, 2012). Behavior and attitudes are determined by one's belief in things to do accompanied by the effects and consequences. If things are considered to bring in benefits or advantages in life, the intention will rise. Thus, if one is convinced that being an entrepreneur will have a positive effect on one's life, higher motivation will rise which in turn enhances interest in entrepreneurship. The research findings by Elfandi et al. (2021), Farani et al. (2017), Ibrahim and Mas'ud (2016), Kusuma and Warmika (2016), Wardana et al. (2021) revealed that a positive influence was found between motivation and entrepreneurial intention.

H3: Motivation has a positive influence on entrepreneurial intention.

Business Literacy on Entrepreneurial Intention

Business literacy accordance with the factors of control belief in the theory of planned behavior (Ajzen, 2012) is one's perception related to one's belief and ability to be an entrepreneur. If students perceive entrepreneurship as easy, they will be interested in doing entrepreneurship. Perceptions about the ease of entrepreneurship will increase if students have business literacy, so they will be interested in doing entrepreneurship. Business literacy is an understanding and ability in the business area. It is the knowledge gained in various ways that encourages people to have an entrepreneurial interest (Elfandi et al., 2021). Farani et al. (2017) stated that business literacy demonstrates business process knowledge to be used in the decision-making process of business. The research finding by (Elfandi et al., 2021; Farani et al., 2017; Ibrahim & Mas'ud, 2016) revealed that there was a relationship between business literacy and entrepreneurial intention. Game-Based Learning platform with MonsoonSIM that contains business concepts will enhance users' business understanding thus increasing entrepreneurial intention.

H4: Business literacy has a positive influence on entrepreneurial intention.

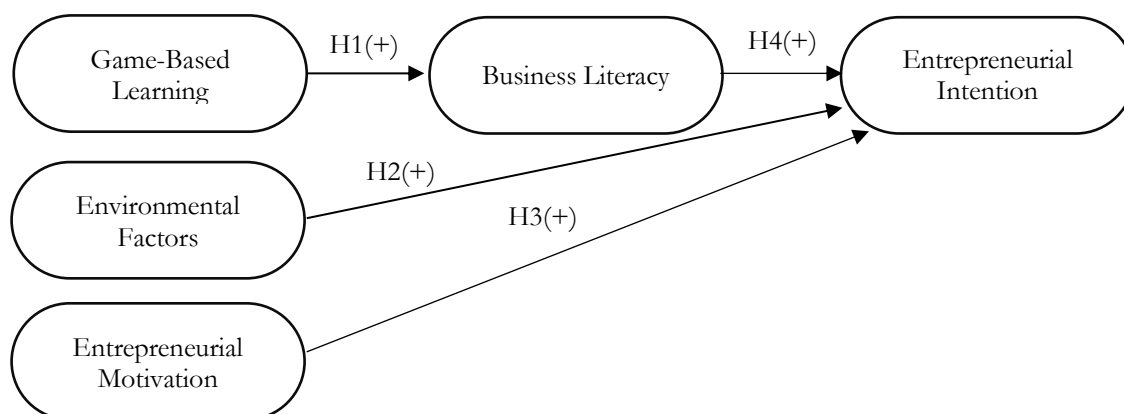


Figure 1. Research Model

Research Method

This research study is quantitative research using primary data which was conducted in 2022. The population of this study are students in the Special Region of Yogyakarta. Incidental sampling was employed for active students who have used MonsoonSIM. This study uses incidental sampling for active students who have run the game-based learning MonsoonSIM. Based on the sample requirements, 121 students met the research sample requirements. Data collection was conducted by distributing questionnaires online using the 4-Likert scale, from scale 1 'strongly disagree' until scale 4 'strongly agree'.

This research study has three independent variables-game-based learning, entrepreneurial motivation, and environmental factors, and two dependent variables – business literacy and entrepreneurial intention. Game-based learning is a learning method designed in such a way for educational purposes. The characteristics of the method are enjoyable, interesting, experience-based, challenging, interactive, and promoting generic and cooperative abilities. It was represented in the indicators that were adapted from (Hwang & Cruthirds, 2017) for GBL 2, (Burhanudin et al., 2021) for GBL 3, 4 and one indicator GBL added by the researcher of this study.

Table 1. Indicator for Game-based Learning

Item	Game-based Learning
GBL 1	Enjoyable
GBL 2	Effective in providing learning experiences
GBL 3	Providing challenges in decision making
GBL 4	Building team communication

Entrepreneurial motivation is the reason to do entrepreneurial activities. There were three indicators for this variable referring to (Elfandi et al., 2021).

Table 2. Indicator for Entrepreneurial Motivation

Item	Entrepreneurial Motivation
EM 1	Bringing ideas into reality and self-describing
EM 2	Providing social care
EM 3	Giving freedom in running a business

Environmental factors are the condition surrounding the individual. There were three indicators for this variable referring to (Ng et al., 2017).

Table 3. Indicator for Environmental Factors

Item	Environmental Factors
EF 1	Family influence
EF 2	Society influence
EF 3	Friends influence

Business literacy is the knowledge related to business processes. There were three indicators for this variable referring to (Ebrahimi et al., 2013)

Table 4. Indicator for Business Literacy

Item	Business Literacy
BL 1	Increased understanding of business
BL 2	Ability to read opportunities
BL 3	Business management skills

Entrepreneurial intention is the desire or intention to dare to do business or own a business. It was represented in the indicators that were adapted from (Elfandi et al., 2021)

Table 5. Indicator for Entrepreneurial Intention

Item	Entrepreneurial Intention
EI 1	Intention to run a business
EI 2	Desire to expand work
EI 3	Desire to become an entrepreneur

This research study made use of Partial Least Square (PLS) to analyze the data. The hypotheses testing employed the value of the original sample and p-value with the hypotheses criteria if the p-value < 0.05 and the direction of the regression coefficient fits the hypothesized one, so the hypothesis proposed is supported.

Results and Discussions

The research sample is 121 respondents, dominated by female respondents by 57%. The majority of the respondents (56.2%) were aged 20-25 years old, 92.6% of the respondents were from the Accounting Study Program, and most of them were from the batch of 2020.

Variable Description

Results of the descriptive statistical analysis are presented in Table 6.

Table 6. Results of Statistical Analysis

Information	n	Min	Max	Mean	Std.Dev
Game-based Learning	121	2	4	3.605	0.549
Entrepreneurial Motiv.	121	1	4	3.539	0.581
Environmental Factors	121	1	4	2.866	0.898
Business Literacy	121	1	4	3.486	0.625
Business Intention	121	1	4	3.331	0.746

Source: Research Result, 2022.

The table shows that Game-based Learning has a mean value of 3.605, Entrepreneurial Motivation of 3.539, Environmental Factors of 2.866, Business Literacy of 3.486, and Entrepreneurial Intention of 3.331. These scores indicate that the respondents agree with the question items in the research. The results of standard deviation for all variables do too that the data dispersed is different from one another.

Results of Data Testing

The value of the loading factor for all question items on all research variables is above 0.7, Average Variance Extracted (AVE) above 0,5 and AVE squared for each variable > correlation coefficient, so the whole question items are valid and can be used. The value of composite reliability and Cronbach's Alpha on each research variable is > 0.7, so all variables have high reliability. Meanwhile, the results of the model test show the value of Adj R-Square on the variable business literacy is 0.572 and on the variable entrepreneurial intention is 0.445.

Results of Hypotheses Testing

Table 7 demonstrates that the relationship between game-based learning and business literacy has a positive original sample value of 0.756 and p-value of 0.000, thus H1 is supported. This finding has proven that game-based learning has a positive influence on students' business literacy. This

research result is aligned with the research by Joella et al. (2020) revealing a positive response to the game-based learning method. It is also in line with the finding by Burhanudin et al. (2021) that MoonsoonSIM was one of the innovative and impressive educational game platforms in increasing the understanding of ERP and business concepts. The result of testing between environmental factors and business intention shows an original sample value of 0.054, but the p-value of 0.414 is larger than the significance level of 0.05. Thus, H2 not supported, which means environmental factors do not have a positive influence on entrepreneurial intention. This is probably due to because students already have definite plans regarding the career they will choose after graduation, so that environmental factors do not affect the intention to become entrepreneurs. The unproven research results are probably also influenced by the lack of confidence of the students in their business capabilities. This research finding in line with (Dwi Agustin & Trisnawati, 2021; Rahmadi & Heryanto, 2016) revealing that a positive influence was not found between family influence on entrepreneurial intention.

Table 7. Results of Hypotheses Testing

Hypotheses	Path	Original Sample	P-Value	Decision
H1	GBL → BL	0.756	0.000	Supported
H2	EF → EI	0.054	0.414	Not Supported
H3	EM → EI	0.554	0.000	Supported
H4	BL → EI	0.166	0.088	Not supported

Furthermore, the relationship between entrepreneurial motivation and business intention shows an original sample value of 0.554 and a p-value of 0.000, so H3 is supported. This finding indicates that motivation in entrepreneurship highly determines the level of entrepreneurial intention. The higher the motivation to do entrepreneurship, the better the entrepreneurial intention (Kusuma & Warmika, 2016). This finding supports the research by Elfandi et al. (2021) revealing that a positive influence was found between entrepreneurial motivation and entrepreneurial intention. For the last hypothesis, the testing of business literacy and entrepreneurial intention has yielded a value of 0.166, but a p-value of 0.088 is larger than the significance level of 0.05. Thus, H4 not supported. This insignificant result shows that the respondents' understanding of business had not been able to boost the intention to start a business or to have a venture. Game-based learning using MonsoonSIM is proven to improve business literacy but is unable to enhance entrepreneurial intention. This is probably due to a lack of strong convictions to initiate a business starting from doubts related to the capital required to open a new business, or the students already have aspirations to work in certain sectors. This finding support in line with (Nurbaeti et al., 2016) stated that financial literacy and accounting literacy have no effect on attitudes towards the creation of new businesses.

Thus, educational institutions need to take initiative to promote business literacy which can bring out students' entrepreneurial intentions. On the other hand, students need to increase awareness and knowledge about the importance of understanding entrepreneurship, including the courage to initiate a business.

Conclusions

Based on the testing process, it can be concluded that game-based learning has a positive influence on students' business literacy, and entrepreneurial motivation has a positive influence on entrepreneurial intention. However, this research study has not succeeded in proving environmental influence and business literacy on entrepreneurial intention. These research findings lead to a few implications for higher education to do business learning using a business game as it has been proven to promote students' business literacy. Higher education also needs to increase student motivation to become entrepreneurs because it has been proven to influence the

intention to become entrepreneurs. Based on the results of this study, games-based learning using MonsoonSim is suggested to be used as a business learning tool because it has been proven to have a positive effect on business literacy.

However, in this study, games-based learning explain only 57.2% of the business literacy and all independent variable explain only 44,5% dependent variable so for further studies, it is recommended that they add a variable of capital requirement as a factor affecting entrepreneurial intention. It is also recommended that further research investigate the negative influence of game-based learning, for example, users' frustration feeling when coming across difficulties during the game which might potentially deteriorate learning effectiveness, thus not increasing business literacy. The number of samples is relatively small because only a few higher education institutions in Yogyakarta have used game simulators for business learning.

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