



# The Impact of Using Digital Simulation Games in Improving Students' Financial Literacy, Attitude, and Behaviour

I Gede Iwan Suryadi, Ni Wayan Sumetri, Putu Adriani Prayustika  
Dept. of Business Administration, Politeknik Negeri Bali  
Bali, Indonesia  
gedeiwan@pnb.ac.id

**Abstract**— The study is conducted to determine whether digital simulation games can be used as an effective tool to improve students' financial literacy. The population in this study was students from the Bali State Polytechnic, who took financial management courses. The research sample was taken using purposive sampling techniques and consisted of 52 students who were divided into groups that used digital simulation games and groups that did not use digital simulation games. The research instrument used in this study was a questionnaire consisting of financial knowledge, attitudes, and Behavior. The collected data was analyzed using Independent Sample t-test and One Way ANOVA analysis techniques. The results showed that the use of digital simulation games can improve students' financial knowledge, attitudes, and Behaviors. Students who use digital simulation games have better financial knowledge compared to students who do not use digital simulation games. In addition, students who use digital simulation games have a more positive attitude towards financial management and better financial Behavior. This study provides recommendations to the higher education college to consider the use of digital simulation games as one of the learning strategies and practicums in financial management courses. In addition, this research also provides benefits for students in improving their financial knowledge, attitudes, and Behaviors.

**Keywords**—financial literacy; financial attitude; financial behavior; simulation game; financial game

## I. INTRODUCTION

Financial education is becoming important in the face of an increasingly complex economic world. Today, the use of innovative educational technologies such as digital simulation games is seen as a solution to improve students' financial knowledge, attitudes, and behaviors. Digital simulation games can help students understand complex financial concepts and improve their ability to make wise financial decisions. The use of digital simulation games is gaining popularity in education and training due to its ability to improve understanding and skills in safe and realistic situations. In the context of finance, simulation games can help students understand complex financial concepts and improve their ability to make wise financial decisions [1],

Constructivist learning theory emphasizes the importance of hands-on experience and problem-solving for effective learning. This theory says that individuals actively build their own knowledge from direct experience and not just receive outside information. In the context of financial simulation games, this theory suggests that college students will be more effective in building their financial knowledge and skills through hands-on experience and problem-solving in realistic situations. Furthermore, behavioral economic theory highlights that psychological, social, and situational factors have an impact on individual financial decisions. In this context, financial simulation games can help college students develop a more positive attitude towards finances, which in turn can help them make better financial decisions in the future.

According to [2], experiential learning is the process by which a person learns through direct experience and reflection on that experience. Experiential learning is different from learning through lectures or verbal explanations, as experiential learning provides learners with direct experience allowing them to understand concepts in a more effective way.

In the context of teaching financial management, experiential learning can be done through digital simulation games. Through digital simulation games, students can gain hands-on experience in managing their own finances and can see the results of financial decisions made. This can help students to understand the concept of financial management in a more effective way and can build good financial attitudes and behaviors.

Previous research has shown that financial simulation games have a positive impact on students' financial knowledge and behavior. [3] found that the use of financial simulation games can help students improve their knowledge of investment and risk management. In addition, financial simulation games can also help students develop a positive attitude towards finance. According to a study conducted by [4] financial simulation games can help college students develop a more positive attitude towards finances, which in turn can help them make better financial decisions in the future.

However, the use of financial simulation games does not always provide consistent results. Research conducted by [5] shows that although financial simulation games can help improve financial knowledge, there is not always a direct relationship

between financial knowledge and behavior. In addition, there are also concerns that the use of financial simulation games may distract students from more important material. Research conducted by [6] shows that students who focus too much on financial simulation games can lose focus on important financial theory material.

Nonetheless, some studies show that the use of financial simulation games combined with well-presented financial theory material can provide better results. [7] found that college students who used financial simulation games and well-presented financial theory materials experienced significant improvements in financial literacy and behavior. In the development of financial simulation games, it is important to consider the right game design and the appropriate target audience. [8] found that well-designed financial simulation games can help students with diverse financial backgrounds.

Several studies have shown that the use of digital simulation games in financial education can improve students' financial literacy. Research conducted by [1] shows that the use of digital simulation games can improve the understanding of complex financial concepts and improve students' ability to make financial decisions. In addition to increasing financial literacy, digital simulation games can also improve students' financial attitudes and behaviors. According to [3], the use of digital simulation games can increase students' interest in financial topics and help them develop a more positive attitude towards finance.

In addition, [4] showed that the use of digital simulation games in financial education can improve student financial behavior, such as financial planning and savings. In their study, college students who participated in financial simulation games reported having higher savings rates than those who did not participate. However, not all studies show the same effect. A systematic review by [5] suggests that although digital simulation games can improve financial knowledge and skills, the effects on financial attitudes and behavior remain unclear.

Other studies have also shown that the effects of digital simulation games depend on the design and implementation of those games. Research conducted by [9] shows that goal-oriented financial simulation games can help improve students' ability to plan and manage their finances. In addition, several other factors can also affect the effectiveness of using digital simulation games in improving students' financial knowledge, attitudes, and behaviors. For example, age, previous financial experience, and individual learning preferences can influence college students' responses to financial simulation games [5].

Digital simulation games can be an effective tool in improving students' financial knowledge, attitudes, and behaviors. Constructivist learning theory and behavioral economics provide the theoretical basis for the use of financial simulation games in financial education. However, the effectiveness of financial simulation games can be influenced by design, implementation, and individual characteristics of students. Therefore, further research is needed to understand the impact of using digital simulation games in improving students' financial knowledge, attitudes, and behaviors.

Thus, this study aims to identify the impact of using digital simulation games in improving students' financial knowledge, attitudes, and behavior and the factors that influence it.

## II. LITERATURE REVIEW

### A. Financial Literacy

Financial literacy is an individual's ability to understand financial concepts, principles, and techniques to manage money well. According to [10], financial knowledge is essential for taking the right financial decisions and achieving long-term financial goals. However, the level of financial literacy is still low in many countries, so it is necessary to develop effective financial literacy programs.

Many factors influence financial literacy, including education, age, gender, financial experience, and social environment. According to research by [11], individuals who are more highly educated, more experienced in finance, and have a supportive social environment tend to have better financial knowledge.

To improve an individual's financial literacy, it is necessary to develop an effective financial literacy program. According to [11] financial literacy programs should include material that is relevant to an individual's daily life, easy to understand, and presented in a variety of interesting formats. In addition, financial literacy programs should also be conducted on an ongoing basis to ensure that individuals acquire adequate financial literacy.

### B. Financial Attitude

Financial attitudes refer to an individual's views, attitudes, and beliefs toward personal finance and public financial policies. According to [12], financial attitudes are very important in shaping individual financial behavior and influencing financial decisions taken. Therefore, it is important to understand the factors that influence an individual's financial attitude.

Numerous variables, such as financial experience, education, age, gender, and cultural influences, have an impact on financial attitudes. According to [12], positive financial experiences and higher levels of education tend to form more positive financial attitudes.

A positive financial attitude can influence an individual's financial behavior. According to [13], individuals with a positive financial attitude tend to make wiser financial decisions, such as saving and investing their money. Conversely, individuals with negative financial attitudes tend to make poor financial decisions, such as going into debt and making impulse purchases.

Improving an individual's financial attitude is essential to form better financial behavior and overcome financial problems that are often faced, such as debt and overspending. According to research by [14], the impact of Using Digital Simulation Games can improve an individual's financial attitude. The program may involve an introduction to important financial concepts, the development of financial skills, and education on wise financial decision-making.

C. Financial Behavior

Financial Behavior refers to the way individuals view and manage their finances. Financial Behavior includes financial decisions, spending Behavior, saving, investing, and debt management. Financial Behavior can be influenced by many factors, including financial attitudes, financial knowledge, and psychological factors.

Poor financial Behavior can have a negative impact on an individual's financial well-being, such as financial hardship, debt, and financial stress. According to research by [15], poor financial Behavior can also have an impact on an individual's mental health, such as anxiety and depression.

D. Financial Digital Simulation Games

Financial digital simulation games are a form of computer game that aims to provide a learning experience on financial topics in an interactive and fun way. In this game, players take on the role of a character who must make financial decisions, such as managing budgets, making investments, and managing financial risks.

Financial digital simulation games have many benefits, including improving financial knowledge and skills, developing a positive attitude towards finances, improving problem-solving and decision-making skills, and helping players prepare for real-life financial situations. According to research by [13], financial digital simulation games can also increase self-confidence and motivate players to practice wiser financial behaviors.

E. Research Model

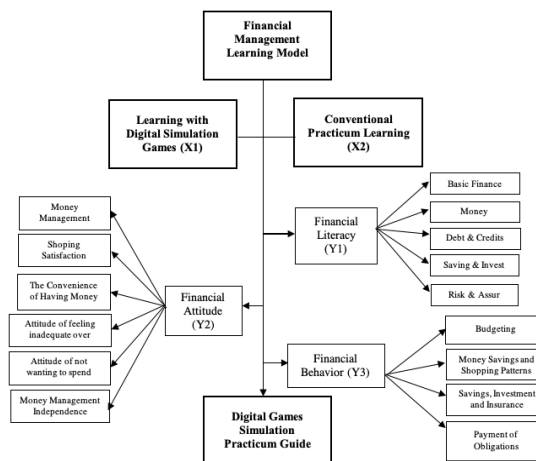


Fig. 1. Digital Financial Simulation Games Model

III. METHODOLOGY

Statistical procedures are used as a method of data analysis in this study, so that the focus of theoretical assessment with an assessment of each variable has a quantitative nature. This research is fundamental research that uses theory to address problems and has no direct impact on decision making; it refers to the objective of this research [41].

A. Data Collection Techniques and Analysis Methods

The survey method, which is a methodology of gathering and evaluating data in the form of opinions from the individuals examined (respondents) through question and answer, is frequently employed in this research. A questionnaire was employed as the survey method in this study (direct questions). Questionnaires can be distributed directly to and collected from respondents (individually), or they can be distributed and collected via url address. Students enrolled in a financial management class were given questionnaires.

This study employs primary data, which is research data gathered directly from the original source (rather than through intermediary media) [16]. The questionnaire will be created in the form of a Google form and distributed to the appropriate pupils.

The questionnaire in this study was adapted from several studies such as: Pankow (2008), [12]) consisting of 20 statements related to 5 (five) aspects of financial knowledge (financial literacy), 8 statements related to 4 (four) aspects of financial Behavior (financial Behavior) and 12 statements related to 6 (six) aspects of financial attitude.

The questionnaire consists of several parts, namely demographic information, questions about the experience of using digital simulation games in financial learning, and questions about students' financial knowledge, attitudes, and behaviors. Questions regarding students' financial knowledge are focused on financial concepts such as money management, investment, insurance, and risk management. Questions about students' financial attitudes include students' beliefs, values, and tendencies in managing their finances. Meanwhile, questions about student financial behavior include students' real actions in managing their finances such as savings, investments, and debt management

This study uses the t-test data analysis method (independent sample t-test and one way ANOVA analysis). Multiple regression analysis is a statistical tool for examining the effect of two or more independent variables on the dependent variable in a linear equation [17].

The descriptive statistical test, data quality test (outlier test, validity test, and reliability test), and hypothesis test were used to assess the data (F-test, t-test, and coefficient of determination test).

#### IV. RESULT AND DISCUSSION

##### A. Descriptive Analysis

Overall, the sample number was 52 students aged 20-22 years. The sample consists of 2 classes, each class consists of 26 people. Class A is the treatment group that uses financial digital simulation games, and Class B is the group that does not receive treatment using digital simulation games.

From the research sample obtained, several characteristics of the research sample can be described as follows:

TABLE I. DISTRIBUTION OF SAMPLES BY GENDER IN TREATMENT GROUP A AND TREATMENT GROUP B.

Gender	Class A		Class B	
	n	percent	n	percent
Man	14	53.8	12	46.2
Woman	12	46.2	14	53.8
Total	26	100.0	26	100.0

TABLE II. RESULTS OF MEASUREMENT OF KNOWLEDGE, ATTITUDES AND FINANCIAL BEHAVIOR ON TREATMENT GROUP A AND TREATMENT GROUP B.

Measurement	Class A			Class B		
	n	mean	sd	n	mean	sd
Financial Literacy	26	52.08	5.222	26	43.81	3.510
Financial Attitude	26	70.26	6.002	26	61.31	4.240
Financial Behavior	26	50.04	5.510	26	45.69	3.484

##### B. Normality and Homogeneity Test

The amount of Sig value of student financial knowledge data is 0.075 more than 0.05. In accordance with the test, it can be said that the sample comes from a normally distributed population. The amount of Sig value of student financial attitude data is 0.047 more than 0.05. In accordance with the test, it can be said that the sample comes from a normally distributed population. The amount of Sig value of student financial Behavior data is 0.064 more than 0.05. In accordance with the test, it can be said that the sample comes from a normally distributed population.

The results of the homogeneity test using One Way Anova can be seen as follows:

- Student financial knowledge scores Sig. 0.060 more than 0.05 with a degree of freedom that is df2 equal 50. From these results, it can be said that the research data is homogeneous because it has the same variance.
- The financial attitude of students' scores Sig. 0.059 more than 0.05 with a degree of freedom that is df2 equal 50. From these results, it can be said that the research data is homogeneous because it has the same variance.
- Student financial Behavior Sig. 0.128 more than 0.05 with a degree of freedom that is df2 equal 50. From these results, it can be said that the research data is homogeneous because it has the same variance.

### C. Hypothesis Testing

Based on the results of the hypothesis test, a Sig (2-tailed) value of 0.000 less than 0.05 was obtained. This means that if hypothesis 1 is accepted, there is a significant difference in students' financial knowledge between the group of students who use digital simulation games and do not use digital simulation games.

Based on the results of hypothesis test 2, a Sig (2-tailed) value of 0.000 less than 0.05 was obtained. This means that if hypothesis 2 is accepted, there is a significant difference in students' financial attitudes between groups of students who use digital simulation games and do not use digital simulation games.

Based on the results of hypothesis test 3 in table 4.7 above, a Sig (2-tailed) value of 0.000 was obtained less than 0.05. This means that if hypothesis 3 is accepted, there is a significant difference in student financial Behavior between groups of students who use digital simulation games and do not use digital simulation games. Based on the results of hypothesis test 4, the Financial Knowledge variable obtained a Sig value of 0.543 less than 0.05. In the Financial Attitude variable, a Sig value of 0.780 more than 0.05 was obtained and in the variable Financial Behavior obtained a Sig value of 0.371 more than 0.05. This meant that hypothesis 4 was rejected and  $H_0$  accepted, and there were no significant differences in students' knowledge, attitudes and financial Behavior between the male and female student groups.

Based on the results of hypothesis test 5, the Financial Knowledge variable obtained a Sig value of 0.000 less than 0.05. In the Financial Attitude variable, a Sig value of 0.000 is obtained less than 0.05 and in the Financial Behavior variable, a Sig value of 0.001 less than 0.05 was obtained. This means that hypothesis 5 is accepted and there are significant differences in students' knowledge, attitudes and financial Behavior between class A student groups and class B students. Based on the results of hypothesis test 6 in table 4.10 above, the Financial Knowledge variable obtained a Sig value of 0.525 more than 0.05. On the variable Financial Attitude Sig values of 0.153 more than 0.05 were obtained and in the Financial Behavior variables, Sig values were obtained of 0.784 less than 0.05. This means that hypothesis 6 was rejected and  $H_0$  accepted, and there were no significant differences in students' knowledge, attitudes and financial Behavior between groups of students who had GPAs ranging from 2.61 to 3.50 and 3.51 to 4.00.

### D. Implication

The results of the research conducted can be taken into consideration in the use of digital game simulation-based financial management practicum guidebooks so that they can be used more widely, because they can help students increase financial knowledge in themselves, besides that students who have good financial attitudes and behaviors will greatly impact various other skills.

## V. CONCLUSION

Based on the statistical parameters used, it can be seen that students who simulate digital games have better knowledge, attitudes and financial behaviors than students who do not simulate digital games.

Research shows that students' financial knowledge, attitudes and behavior can be improved by simulating digital games, but improvements need to be made to financial management practicum guidelines from the context of material and digital game simulation demonstrations in helping students do practicum. Of course, this must be considered so that later practicum activities that are used as a means of forming financial management skills can maximally help students in improving financial knowledge, attitudes and behaviors and other skills.

## ACKNOWLEDGEMENT

Politeknik Negeri Bali provided financial support for this project through a competitive grant research.

## REFERENCES

1. I. Mayer, "Assessment of Teams in a Digital Game Environment," *Simul. Gaming*, vol. 49, no. 6, pp. 602–619, 2018, doi: 10.1177/1046878118770831.
2. D. Kolb, *Experiential Learning: Experience As The Source Of Learning And Development*, vol. 1. 1984.
3. T. Kaiser, A. Lusardi, L. Menkhoff, and C. Urban, "Financial education affects financial knowledge and downstream Behaviors," *J. financ. econ.*, vol. 145, no. 2, pp. 255–272, 2022, doi: 10.1016/j.jfineco.2021.09.022.
4. A. Sconti, "Digital vs. in-person financial education: What works best for Generation Z?," *J. Econ. Behav. Organ.*, vol. 194, pp. 300–318, 2022, doi: 10.1016/j.jebo.2021.12.001.
5. Gunartin *et al.*, "A Systematic Literature Review of Education Financing Model in Indonesian School," *Syst. Rev. Pharm.*, vol. 11, no. 10, pp. 638–644, 2020, doi: 10.31838/srp.2020.10.96.
6. S. R. Curland and S. L. Fawcett, "Using simulation and gaming to develop financial skills in undergraduates," *Int. J. Contemp. Hosp. Manag.*, vol. 13, no. 3, pp. 116–119, 2001, doi: 10.1108/09596110110388891.
7. J. Barnaby, D. Devins, and N. Beech, "Using simulation to develop business strategy skills of entrepreneurs - Some reflections on a pilot," *Ind. High. Educ.*, vol. 35, no. 3, pp. 270–275, 2021, doi: 10.1177/0950422220945672.
8. Y. S. Schöler, P. P. Hiebert, and T. A. Peltonen, "Financial cycles: Characterisation and real-time measurement," *J. Int. Money Financ.*, vol. 100, 2020, doi: 10.1016/j.jimonfin.2019.102082.
9. E. Ortiz-Martínez, J. M. Santos-Jaén, and M. Palacios-Manzano, "Games in the classroom? Analysis of their effects on financial accounting marks in higher education," *Int. J. Manag. Educ.*, vol. 20, no. 1, 2022, doi: 10.1016/j.ijme.2021.100584.
10. G. Belsky and T. Gilovich, *Why Smart People Make Big Money Mistakes and How to Correct Them: Lessons from the Life-Changing Science of Behavioral Economics*. Simon & Schuster, 2010.
11. A. Lusardi and O. Mitchell, "FINANCIAL LITERACY AROUND THE WORLD - Annamaria Lusardi and Olivia S. Mitchell," *Nber*, vol. 17, no. 4, pp. 1–14, 2011.
12. A. Furnham, "Many sides of the coin: The psychology of money usage," *Pers. Individ. Dif.*, vol. 5, no. 5, pp. 501–509, 1984, doi: 10.1016/0191-8869(84)90025-4.
13. K. A. Kim and J. R. Nofsinger, "Behavioral finance in Asia," *Pacific Basin Financ. J.*, vol. 16, no. 1–2, pp. 1–7, 2008, doi: 10.1016/j.pacfin.2007.04.001.
14. J. J. Xiao, "Financial Literacy in Asia: A Scoping Review," *SSRN Electron. J.*, no. 2015, 2021, doi: 10.2139/ssrn.3743345.
15. M. Rahman, C. Ruhana Isa, M. Mehedi Masud, M. Sarker, and N. T. Chowdhury, "The role of financial behavior, financial literacy, and financial stress in explaining the financial well-being of B40 group in Malaysia," *Futur. Bus. J.*, vol. 7, no. 1, p. 52, doi: 10.1186/s43093-021-00099-0.
16. Sugiyono, "Metode Penelitian," *Metod. Penelit.*, 2015.
17. Sugiyono, *Metode Penelitian Kombinasi (Mixed Methods)*. 2017.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

