Al Qalam: Jurnal Ilmiah Keagamaan dan Kemasyarakatan
https://jurnal.stiq-amuntai.ac.id/index.php/al-qalam
P-ISSN: 1907-4174; E-ISSN: 2621-0681
DOI : 10.35931/aq.v19i1.3994

ENHANCING FINANCIAL LITERACY THROUGH EDUCATIONAL GAME-BASED LEARNING MATERIALS

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Abstract

This study aims to develop educational materials based on financial literacy through educational games to enhance high school students' understanding of financial literacy. Using the Research and Development (R&D) method with the 4-D model by Thiagarajan, Semmel, and Semmel, this research involves the stages of define, design, develop, and disseminate. The study was conducted at SMAN 9 Pekanbaru with subjects being tenth-grade students. Data were collected through interviews, questionnaires, and tests, and analyzed using descriptive techniques, t-tests, and N-Gain to measure the effectiveness of the instructional materials. Validation results indicated that the instructional materials had an overall average of 94.44%, categorized as highly valid. Field trials showed the practicality of the instructional materials with average responses from teachers at 95.56%, from students at 88.22%, and from observations at 88,63%. N-Gain test results showed that students' understanding increased with an average N-Gain score of 0.6594, which falls into the "moderate" category. The effectiveness of using financial literacy instructional materials based on educational games reached 65.94%, categorized as "moderately effective". Thus, these instructional materials are proven to be moderately effective in improving students' financial literacy understanding regarding banking and non-banking financial institutions.
Keywords: financial literacy, educational games, instructional materials, industrial revolution 4.0, 21st-century education.

Abstrak

Penelitian ini bertujuan untuk mengembangkan materi ajar berbasis literasi keuangan melalui permainan edukatif untuk meningkatkan pemahaman literasi keuangan siswa SMA. Dengan menggunakan metode Research and Development (R&D) dengan model 4-D oleh Thiagarajan, Semmel, dan Semmel, penelitian ini melibatkan tahapan define, design, develop, dan disseminate. Penelitian dilakukan di SMAN 9 Pekanbaru dengan subjek siswa kelas X. Data dikumpulkan melalui wawancara, angket, dan tes, dan dianalisis menggunakan teknik deskriptif, uji-t, dan N-Gain untuk mengukur efektivitas materi ajar. Hasil validasi menunjukkan bahwa materi ajar memiliki rata-rata keseluruhan sebesar 94,44%, dikategorikan sangat valid. Uji coba lapangan menunjukkan kepraktisan materi ajar dengan rata-rata respon guru sebesar 95,56%, respon siswa sebesar 88,22%, dan respon observasi sebesar 88,63%. Hasil uji N-Gain menunjukkan bahwa pemahaman siswa meningkat dengan skor N-Gain rata-rata sebesar 0,6594 yang masuk dalam kategori "sedang". Efektivitas penggunaan bahan ajar literasi keuangan berbasis permainan edukatif mencapai 65,94% yang masuk dalam kategori "cukup efektif". Dengan demikian, bahan ajar tersebut terbukti cukup efektif dalam meningkatkan pemahaman literasi keuangan siswa terkait lembaga keuangan perbankan dan nonperbankan.
Kata kunci: literasi keuangan, permainan edukatif, bahan ajar, revolusi industri 4.0, pendidikan abad 21.

INTRODUCTION

The Industrial Revolution can be defined as a period where significant technological advancements coincide with substantial changes in social, economic, and cultural aspects. The term 'Industry 4.0' first emerged in Germany in 2011. The Industry 4.0 era is characterized by the close integration of the digital world with industrial production, where all machines are connected through internet or cyber systems. These changes have a considerable impact on society, especially in the field of education.[1] The Fourth Industrial Revolution has significant implications for 21st-century education.

21st-century education is characterized by rapid advancements in science and technology. This type of education aims to prepare students with the literacy skills, knowledge, and attitudes needed to succeed in an increasingly complex, global, and digitally connected world.[2] Previous research states that students in 21st-century education must possess skills such as 1) global awareness; 2) financial, economic, and entrepreneurial literacy; 3) civic literacy; and 4) health literacy, which can equip them to face the rapid changes of the times.[3]

The World Economic Forum in 2015 identified six core literacies essential in the context of economics and finance: 1) language literacy, 2) numerical literacy, 3) scientific literacy, 4) digital literacy, 5) financial literacy, and 6) cultural and civic literacy.[4] Financial education is necessary to improve public financial understanding, especially based on the 2022 survey results from the Financial Services Authority (OJK). The survey results show that the financial literacy index in Indonesia reached 49.68 percent, a significant increase compared to 2013 (21.84 percent), 2016 (29.70 percent), and 2019 (38.03 percent).[5]

Previous research indicates that in many countries, financial literacy has become a national program with significant impacts on their financial sectors. For instance, the United States has a program known as "Promoting Financial Success in the United States: National Strategy for Financial Literacy." The financial literacy level in the United States far exceeds that of Indonesia. According to data, the financial literacy level of high school students in Indonesia is

[1] M. Afrizal Purba dan A. Defriyando, "Pemanfaatan Teknologi Informasi dalam Pendidikan dan Pembelajaran di Era Revolusi Industri 4.0," dalam *Prosiding Seminar Nasional Ilmu Sosial dan Teknologi (SNISTEK)*, 2020, 96–101.

[2] W.J. Sukmana, "Literasi dan Pendidikan Abad 21," *Publikasi Pembelajaran* 2, no. 2 (2023): 120–25.

[3] I. Aisyah dan A. Srigustini, "Pembelajaran Ekonomi Abad 21: Pengukuran Literasi Ekonomi Siswa Aspek Pengetahuan dan Sikap," *Economic Education and Entrepreneurship Journal* 5, no. 2 (2022): 265–74, https://doi.org/10.23960/e3j/v5i2.265-274.

[4] D. Nudiati dan E. Sudiapermana, "Literasi sebagai Kecakapan Hidup Abad 21 pada Mahasiswa," *Indonesian Journal of Learning Education and Counseling* 3, no. 1 (2020): 34–40, https://doi.org/10.31960/ijolec.v3i1.561.

[5] O.J.K., "Literasi Keuangan," 2023, https://ojk.go.id/id/kanal/edukasi-dan-perlindungan-konsumen/Pages/literasi-keuangan.aspx.

35.7%, while in the United States, it is 44.3%. To catch up, the Indonesian government has launched the "Blueprint of the Indonesian National Financial Literacy Strategy" program.[6]

Previous research explains that low financial literacy is a serious issue because it can have negative impacts on financial behavior, financial conditions, and increase the financial risks faced. Additionally, with the emergence of increasingly complex financial mechanisms and products along with their derivatives, low financial literacy also has the potential to cause individuals to engage in these products with the risk of losing money due to ignorance or information asymmetry between those who are informed and those who are not.[7]

The low financial literacy levels in Indonesia especially among high school students, demand significant efforts from the country's education sector. It is crucial for students to be provided with financial literacy understanding so they can contribute to Indonesia's economic growth. There is a need to develop educational designs encompassing knowledge and understanding dimensions, skills, and attitudes related to financial literacy. This will lead to learning objectives and outcomes aimed at improving high school students' understanding for their future.[8]

According to Hidayat,[9] there are several reasons why it is important to study financial literacy: Firstly, financial literacy has become a national program in several developed countries. Therefore, conducting studies on financial literacy in Indonesia is expected to contribute to existing financial literacy programs. By studying and analyzing financial literacy in Indonesia, we can identify the unique needs and challenges in this country and develop appropriate strategies. Secondly, research on financial literacy in Indonesia is still limited. Although many studies on financial literacy have been conducted in developed countries, the number of studies conducted in developing countries, especially in Indonesia, remains limited. Therefore, conducting studies on financial literacy in Indonesia will provide a better understanding of the situation and challenges faced by the population in this country. Lastly, it is important to understand the characteristics, level of financial literacy, and financial behavior of the population. Through studies on financial literacy, we can understand the extent of the population's knowledge, skills, and understanding in managing their finances. Additionally, we can identify the factors influencing their financial

[6] I. Kusumaningtyas dan N.C. Sakti, "Pengaruh Literasi Keuangan dan Gaya Hidup terhadap Perilaku Konsumtif Siswa Kelas XI IPS di SMA Negeri 1 Taman Sidoarjo," *Jurnal Pendidikan Ekonomi (JUPE* 5, no. 3 (2017): 1–8.

[7] T. Hidayat, *Literasi Keuangan* (Semarang: STIE Bank BPD Jateng, 2015).

[8] Sahat Renol, "Kajian Literasi Keuangan pada Siswa Menengah Atas (SMA): Sebuah Pemikiran," *Prosiding Seminar Pendidikan Ekonomi dan Bisnis*, 1 Januari 2017, https://www.academia.edu/74105223/Kajian_Literasi_Keuangan_Pada_Siswa_Menengah_Atas_Sma_Sebuah_Pemikiran.

[9] Hidayat, *Literasi Keuangan*.

behavior, allowing for the design of appropriate programs and interventions to enhance financial literacy and change unhealthy financial behaviors.

Based on observations conducted in class X of SMAN 9 Pekanbaru, several issues were identified: 1) Based on pretest results regarding the role of interest rates on bank products from 37 students, only 11 (31.4%) answered correctly. This indicates that students' financial literacy regarding bank products is still low. 2) In economics lessons, teachers typically use PowerPoint slides to present material to students, then explain and provide practice questions. This results in students only needing to listen and take notes from the teacher's explanation, leading to underdeveloped independent learning skills. Only a small portion of students actively participate in the classroom learning process. 3) Adequate financial literacy instructional materials are not yet available for teachers and students.

By identifying these issues, this study aims to create an innovative solution by developing game-based instructional materials. Through this approach, it is expected to create a more effective learning experience and improve students' financial literacy. One method to enhance students' financial literacy skills is through information technology-based learning approaches, such as electronic system games (game-based e-learning). This approach not only serves as entertainment but also as an educational tool.

Educational games are effective teaching aids for teachers in conveying material, leading to higher learning motivation among students.[10] Previous research explains that "digital game-based learning can be a more effective teaching tool in motivating students to learn in complex learning processes compared to traditional instruction".[11] The use of games as one of the instructional materials is chosen because games can provide entertainment to users. This is in line with research findings showing that human psychology prefers entertaining and enjoyable activities over serious learning, which tends to cause boredom.[12]

Besides serving as entertainment, games can transform abstract material into more concrete experiences by providing space for players to experiment, thus games have the potential as effective learning media.[13] The creation of this game requires problem boundaries to ensure the

[10] N.A. Sriwahyuni dan Mardono, "Pengembangan Media Pembelajaran Game Edukasi pada Mata Pelajaran Ekonomi Kelas X IIS SMA Laboratorium Universitas Negeri Malang," *Jurnal Pendidikan Ekonomi (JUPE* 9, no. 2 (2016): 116–27.

[11] G.J. Hwang dkk., "Effects of an Augmented Reality-Based Educational Game on Students' Learning Achievements and Attitudes in Real-World Observations," *Interactive Learning Environments* 24, no. 8 (2016): 1895–1906, https://doi.org/10.1080/10494820.2015.1057747.

[12] M.Al Faridho, "Sharia Economics Edugame (SEE): Alternatif Pengembangan Pemahaman Literasi Keuangan Syariah," *Jurnal Studi Agama dan Masyarakat* 14, no. 1 (2018): 64, https://doi.org/10.23971/jsam.v14i1.808.

[13] M.F. Rafif dan A.S. Patria, "Perancangan Mobile Game sebagai Media Literasi Keuangan untuk Remaja," *ANDHARUPA: Jurnal Desain Komunikasi Visual & Multimedia* 7, no. 2 (2021): 268–81, https://doi.org/10.33633/andharupa.v7i2.3966.

problems addressed are not too broad and align with the intended objectives. The authors limit the problems as follows: (1) The game operates on mobile with Android, iOS, and Windows operating systems; (2) The game is intended for high school students; (3) The game's interface is in 3D; (4) The software used to create the game is Unity 3; (5) The game contains material on financial literacy involving an understanding of banking products and services.

The context of the development being addressed involves several aspects: (1) Low financial literacy skills: The level of students' financial literacy has been identified as a major issue. This research focuses on developing educational materials based on educational games to improve students' financial literacy. (2) Conventional teaching methods: The research highlights that conventional teaching methods involving the use of textbooks, blackboards, and PowerPoint presentations are less effective in enhancing student engagement, resulting in lower motivation to learn. Therefore, the developed teaching materials aim to incorporate a game-based approach to make learning more interactive and engaging. (3) Limited financial literacy teaching materials: The lack of adequate financial literacy teaching materials poses a challenge. The development of these game-based materials is expected to provide a solution by offering relevant resources that can be integrated into economics subjects. (4) Lack of student engagement in the learning process: By utilizing educational games, this research seeks to enhance student engagement in the financial literacy learning process. Interactive and enjoyable teaching materials are expected to stimulate students' interest in learning.

The difference between this study and previous research lies in the type of game and material used. The material used in this game covers banking and non-banking financial institutions. The type of educational game created is an economic adventure game. This research aims to address several issues identified at SMAN 9 Pekanbaru, particularly regarding the low financial literacy skills of class X students.

RESEARCH METHODS

This research utilizes the Research and Development (R&D) method to develop educational products, specifically educational games to enhance students' financial literacy. The development model used is the 4-D model by Thiagarajan, Semmel, and Semmel, which involves four stages: define, design, develop, and disseminate. The define stage includes needs analysis, learner analysis, concept analysis, task analysis, and the formulation of learning objectives. The design stage involves drafting test standards, selecting instructional materials, and creating initial designs. The develop stage includes expert validation and field testing to ensure the quality and feasibility of the product. The disseminate stage is the wider distribution of the product after validation and revisions.

The research was conducted at SMAN 9 Pekanbaru with the subjects being class X students, using purposive sampling techniques to select the sample. Data was collected through interviews, questionnaires, and tests, with data analysis using descriptive techniques, t-tests, and N-Gain to measure the effectiveness of the instructional materials. Validation and practicality tests were conducted using questionnaires, while effectiveness was measured with financial literacy tests before and after using the instructional materials.

In decision-making, the method of assessing the validity, practicality, and effectiveness of the instructional materials in improving students' financial literacy can refer to the following criteria:

Table 1. Feasibility Levels Based on Average Percentage.

Persentase	Validity Criteria	Level of Validity
81% - 100%	Very Good	Very feasible/very valid/no revision needed
61%-80%	Good	Feasible/valid/ no revision needed
41%-60%	Fair	Less feasible/less valid/revision needed
21%-40%	Poor	Not feasible/not valid/revision needed
0-20%	Very Poor	Very unfeasible/very invalid/revision needed

Source : Accraf dkk.[14]

Table 2. Criteria for Practicality of Learning Materials

Value	Level of Practicality
$80 < \rho \leq 100$	Very Practical
$60 < \rho \leq 80$	Practical
$40 < \rho \leq 60$	Fairly Practical
$20 < \rho \leq 40$	Less Practical
$\rho < 20\%$	Not Practical

Sumber: Febriyanti.[15]

The categorization of N-gain scores is detailed in the table below.

Table 3. N-Gain Score Categories

N-Gain Value	**Category**
$g > 0,7$	High
$0,3 \leq g \leq 0,7$	Moderate
$g < 0,3$	Low

Source: Wahab.[16]

[14] L.B.R. Accraf, Suryati, dan Y. Khery, "Pengembangan E-Modul Interaktif Berbasis Android dan Nature of Science pada Materi Ikatan Kimia dan Sains Siswa," *Hydrogen: Jurnal Kependidikan Kimia* 6, no. 2 (2018): 133–41.

[15] D.A. Febriyanti dan S.Q. Ain, "Pengembangan Modul Matematika Berbasis Etnomatematika pada Materi Bangun Datar di Sekolah Dasar," *Jurnal Basicedu* 5, no. 3 (2021): 1409–17.

To determine the effectiveness level of the instructional materials in enhancing student's understanding, refer to the following table:

Table 4. Criteria for Determining Effectiveness Levels

Percentage (%)	Category
< 40	Not Effective
40-55	Less Effective
56-75	Moderately Effective
>76	Effective

Source: Sukarelawan.[17]

RESULTS AND DISCUSSIONS

This study is a type of research and development (R&D) that results in financial literacy instructional materials based on educational games to enhance students' understanding of financial literacy, outlined through the 4-D model stages: Define, Design, Develop, and Disseminate. The research findings include:

Define Phase

1. Initial-Final Analysis: Conducted interviews with Economics teachers at SMAN 9 Pekanbaru to identify learning issues, including the use of PowerPoint presentations, lack of measurement for financial literacy understanding, absence of financial literacy teaching materials, and low student interest.
2. Student Analysis: Identified the cognitive characteristics of 10th-grade students aged 15-16, who are in the formal operational stage according to Jean Piaget's theory.
3. Material Analysis: Identified relevant financial literacy content from the Merdeka Curriculum for 10th grade, including both bank and non-bank financial institutions.
4. Task Analysis: Determined the competencies to be achieved, including understanding concepts and process skills in financial literacy.
5. Formulation of Learning Objectives: Formulated learning objectives based on task and material analysis, such as understanding financial institutions' concepts, the 5C principles, and OJK supervision.

[16] A. Wahab, A. Syahid, dan J. Junaedi, "Penyajian Data dalam Tabel Distribusi Frekuensi dan Aplikasinya pada Ilmu Pendidikan," *Education and Learning Journal* 2, no. 1 (2021): 40, https://doi.org/10.33096/eljour.v2i1.91.

[17] M.I. Sukarelawan, T.K. Indratno, dan S.M. Ayu, *N-Gain vs Stacking* (Yogyakarta: Suryacahaya, 2024).

This phase resulted in the analysis of needs, student characteristics, relevant materials, required tasks, and specific learning objectives aimed at improving students' financial literacy through educational games.

Design Phase

The goal of this phase is to design educational game-based learning materials, which includes:

1. **Selection of Format**

   The content on financial institutions, both bank and non-bank, is organized into an educational game format. The learning material includes game cover page, main menu, material menu, game menu, and evaluation menu. The steps for creating the learning materials are as follows:

   a. Preparing 2D assets using Corel Draw and exporting them as PNG files.
   b. Preparing audio assets from studio.youtube.com.
   c. Importing assets into Unity software.
   d. Organizing assets for each scene in Unity.
   e. Creating animations in Unity.
   f. Developing program files (scripts/code) in Unity using Visual Studio Code.
   g. Exporting to Android and WebGL (HTML5).
   h. Uploading WebGL to itch.io.

2. **Initial Draft Design of Game-Based Educational Materials**

   In this phase, the researcher creates the initial design of the financial literacy educational materials based on the game format. The initial design of the educational materials aligns with the previously selected format. The result of the draft includes a cover page, main menu, instructions, content, game menu, and evaluation menu.

Figure 1. Cover of the Educational Materials

Figure 2. Main Menu of the Educational Materials

Figure 3. Author Profile Page in the Educational Materials

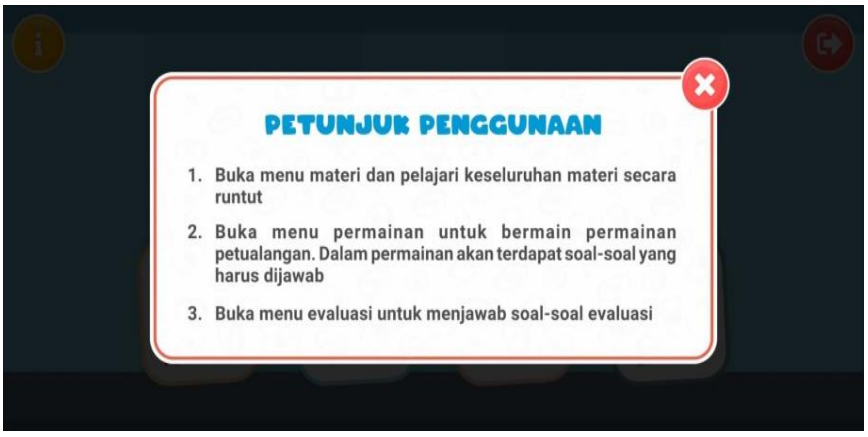


Figure 4. Instructions Page in the Educational Materials

Figure 5. Content Menu of the Educational Materials

Figure 6. Learning Outcomes Page in the Educational Materials

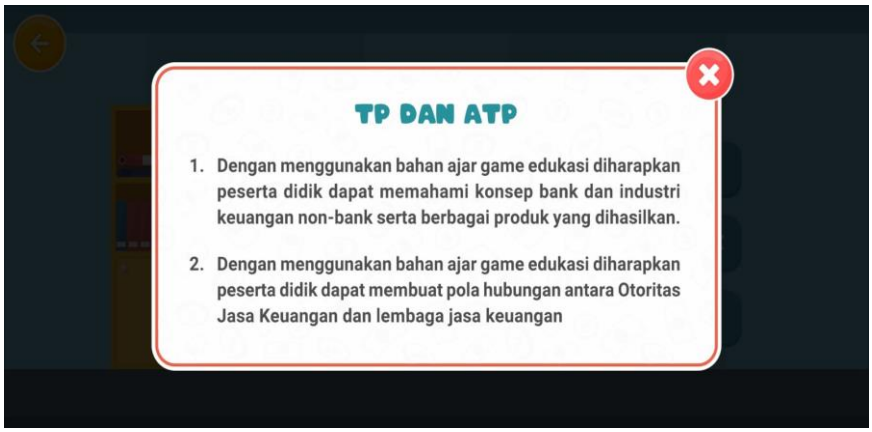


Figure 7. Learning Objectives Page in the Educational Materials

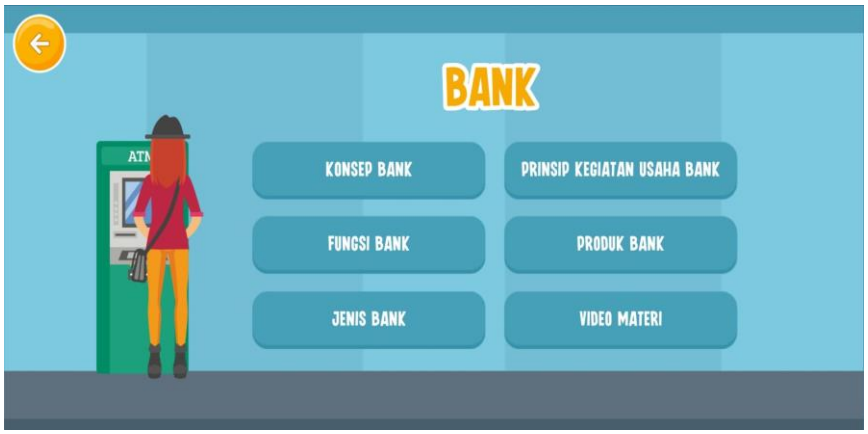


Figure 8. Bank Material Content Page in the Educational Materials

Figure 9. Bank Concept Material Page

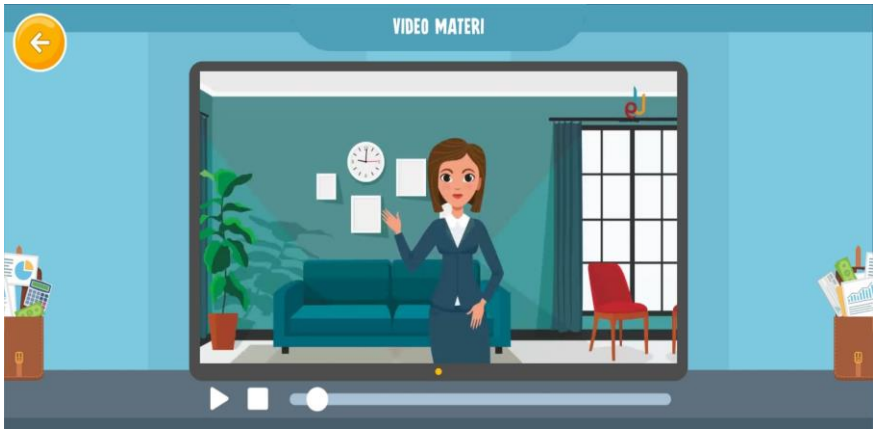


Figure 10. Bank Material Video Page

Figure 11. Non-Bank Financial Industry Material Page

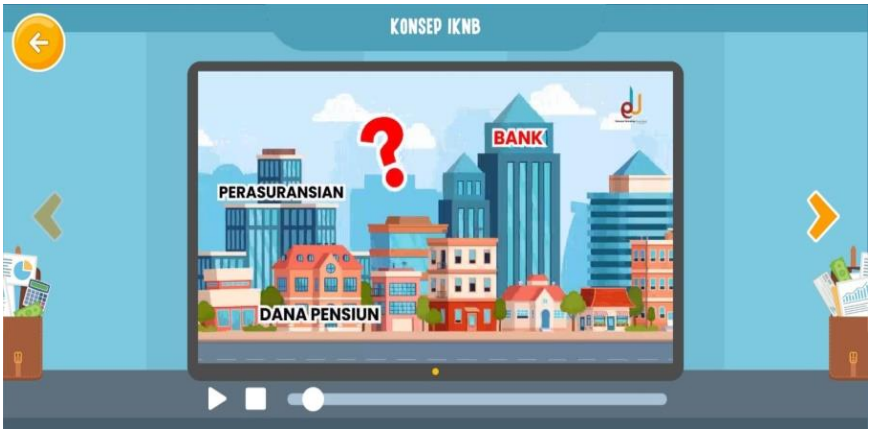


Figure 12. Non-Bank Financial Industry Concept Video Page

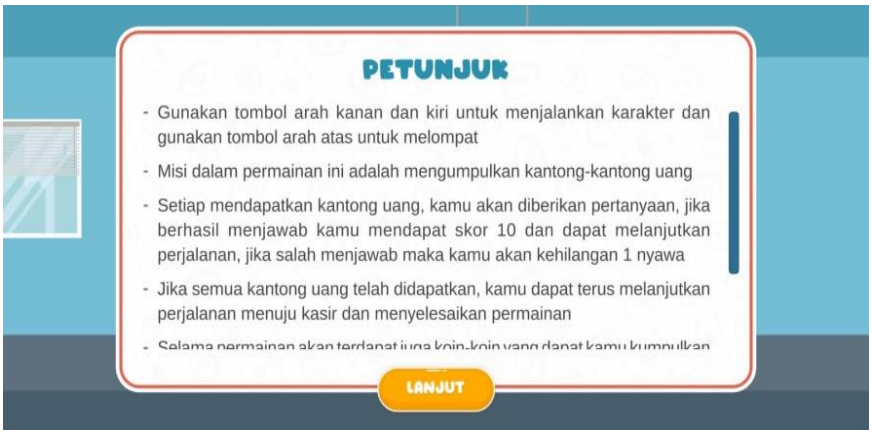


Figure 13. Game Instructions Page

Figure 14. Student Identity Page

Figure 15. Game Background Page

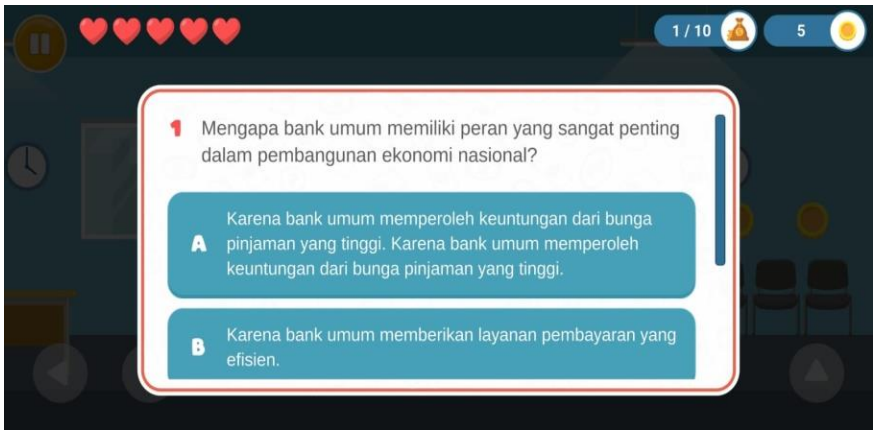


Figure 16. Question Pocket Page in the Game

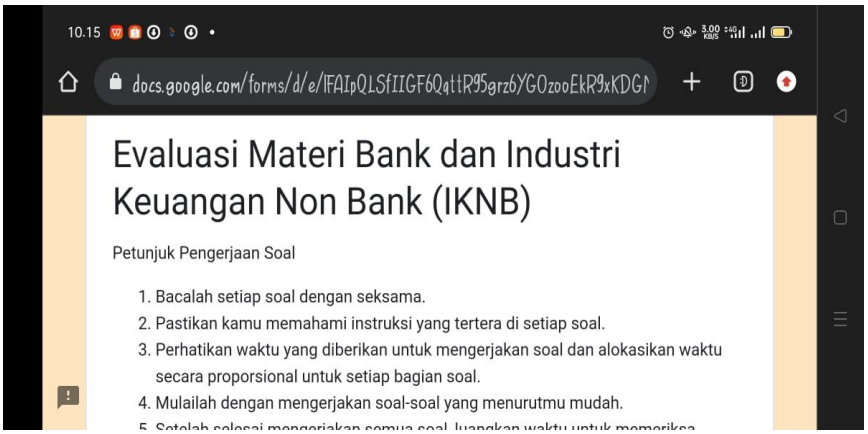


Figure 17. Initial Evaluation Page

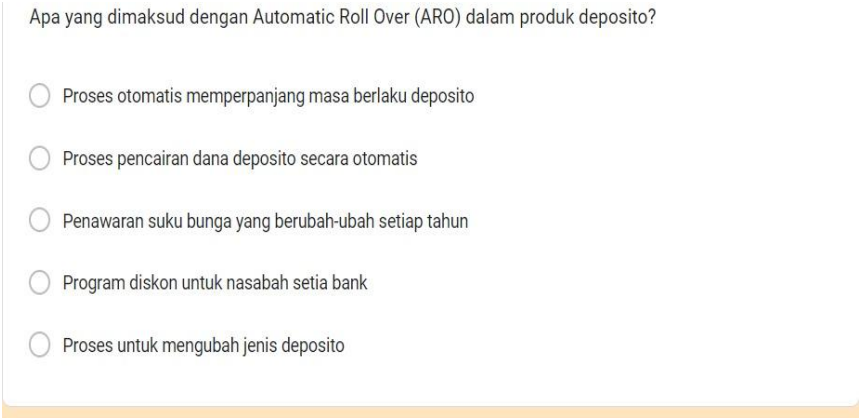


Figure 18. Example Evaluation Question Page.

Development Phase

The development phase consists of two steps: expert/practitioner validation and developmental testing. Expert/practitioner validation involves evaluation by experts in the field to ensure the quality and feasibility of the product. Developmental testing involves testing the product on actual subjects, including students, to obtain direct feedback and responses.

The educational materials that have been designed are then validated by validators using a validation sheet. Validation is carried out by three validators, consisting of two Economics Education lecturers and one teacher, each providing assessments, comments, and suggestions. The validation process was conducted from May 21 to May 28, 2024.

Each validator assesses the educational materials based on several aspects containing multiple indicators presented in the validation sheet. Validators also provide comments and suggestions on the evaluated educational materials to achieve a more perfect product.

1. **Results of the Educational Materials Validation by Media Experts**

The validators' assessment of the educational materials includes aspects of appearance, clarity of text, images, and audio, as well as usability aspects. After validation, the researcher calculates and analyzes the validation results of the educational materials, then makes improvements based on the suggestions given by the validators. Several suggestions provided by the validators for the educational materials can be seen in Table 4 below:

Table 4. Validator Suggestions for Educational Materials

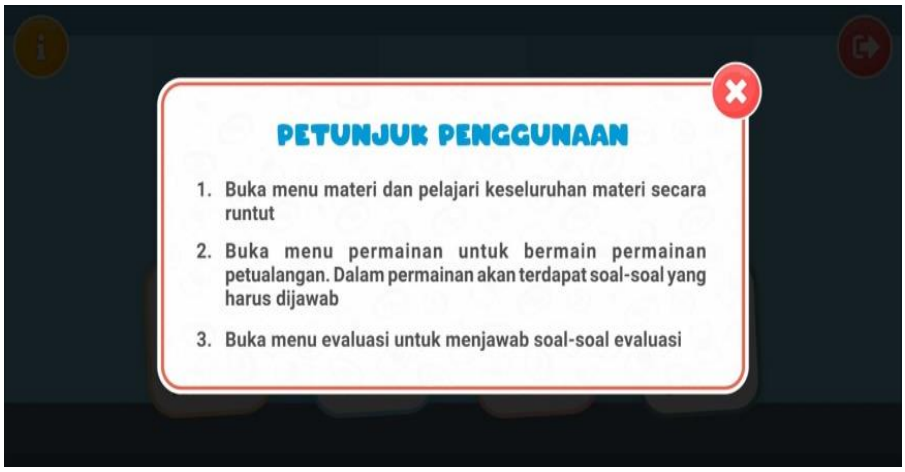
Validator Suggestions and Revisions
1. Before Revision:    Figure 19. Instructions on Using Educational Materials Before Revision Validator's suggestion: Add a video tutorial of the educational materials presented by the researcher to show that the materials were indeed created by the researcher.
After Revision: A video tutorial on using the educational materials has been added as per the validator's suggestion.

Figure 20. Revised Instructions on Using Educational Materials

2. Before Revision:

Figure 21. Educational Materials Menu Before Revision

Validator's suggestion: Move the learning outcomes and learning objectives menu to the main menu.

After Revision: The learning outcomes and learning objectives menu has been moved to the main menu as per the validator's suggestion.

Figure 22. Revised Learning Outcomes and Objectives in Main Menu

3. Before Revision:

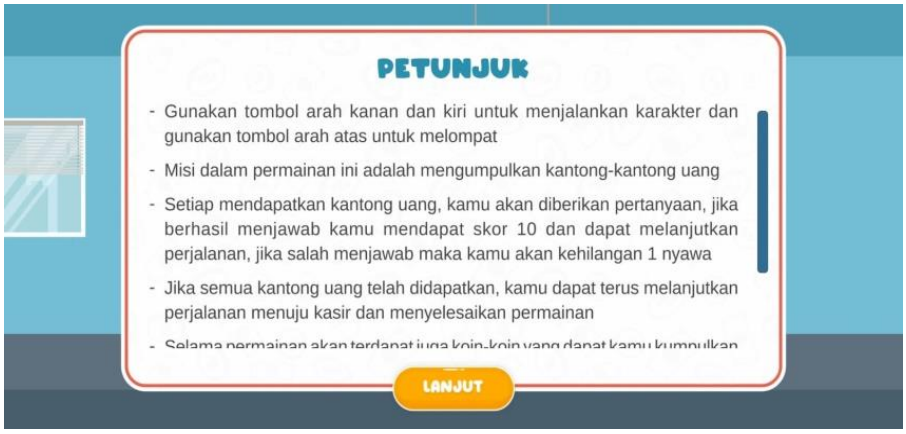


Figure 23. Instructions on Playing the Game Before Revision

Validator's suggestion: Add a video tutorial and simulation on how to play the game to make it easier for students to use the game.

After Revision: A video tutorial and game simulation have been added as per the validator's suggestion.

Figure 24. Revised Video Tutorial and Game Simulation

4. Before Revision

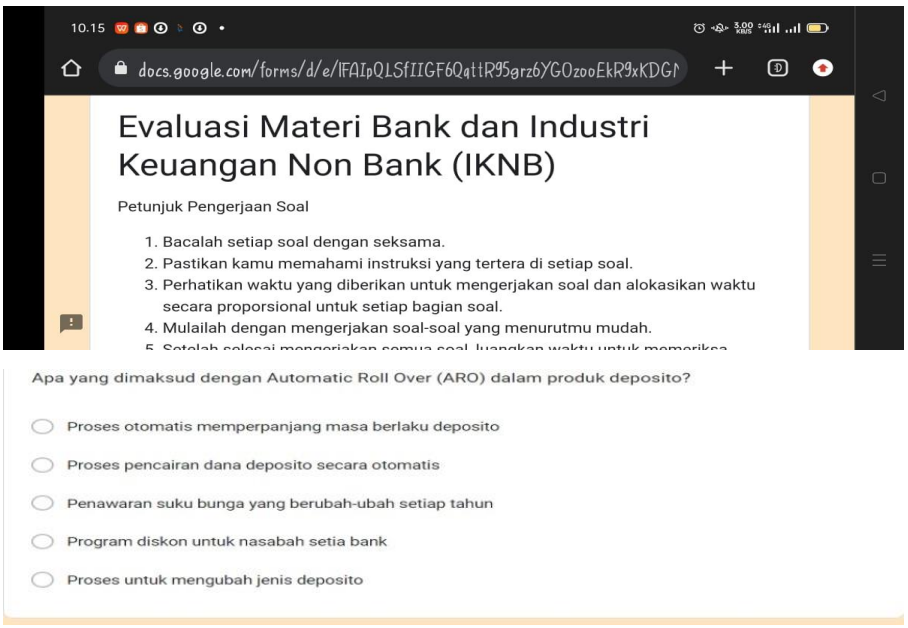


Figure 25. Initial Evaluation Page in Educational Materials

Validator's suggestion: The evaluation questions are currently at cognitive levels C1-C3; improve the questions to cognitive levels C4-C6 and use other platforms for creating questions, such as Quizziz or others.

After Revision: The evaluation questions have been improved and are now using the Quizziz platform as per the validator's suggestion.

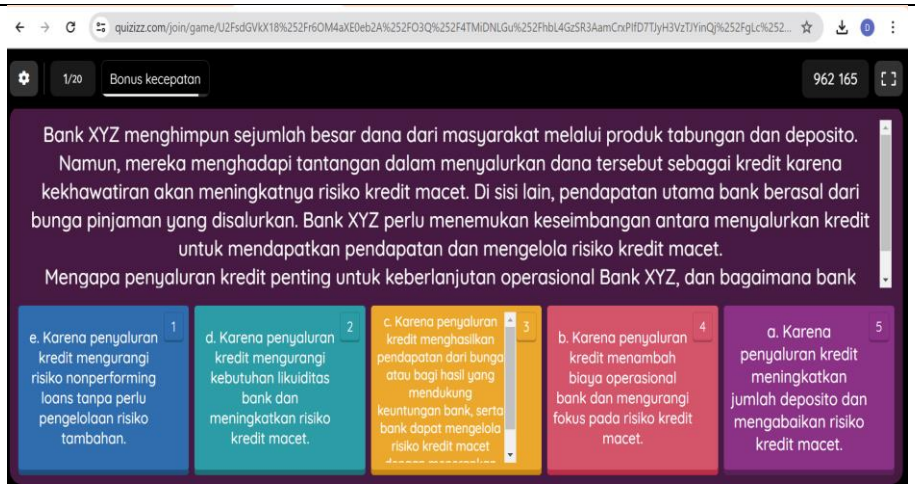


Figure 26. Revised Evaluation Questions

Based on the validation results from the validators, the educational game-based teaching materials have been revised according to the provided suggestions. Overall, these teaching materials received an average total score of 94.44%, indicating a very high validity category and suitability for use. Additionally, the materials were validated by subject matter experts. The evaluation by these experts focused on the language, content, and assessment components of the materials, also resulting in an average total score of 94.44%. This confirms that the teaching materials meet the criteria of very high validity and are highly suitable for use in financial literacy education in the classroom.

2. Field Testing

After the teaching materials were revised and declared valid, they were subjected to field testing to evaluate their practicality and effectiveness. This study demonstrates that the use of game-based educational materials on the topic of banks and non-bank financial institutions is valid, practical, and effective in enhancing students' understanding. The evaluation of responses from teachers and students indicated a high level of practicality, with an average score of 95.56% from teachers, 88.22% from students and 88,63% from observations.

Students responded positively, indicating that these materials helped them better understand complex concepts with engaging visuals that increased their interest in learning. The posttest results showed a significant improvement in students' financial literacy, with an average N-Gain score of 65.94%, demonstrating that these teaching materials are effective in the learning process. These findings are consistent with previous research showing that educational games can enhance students' understanding of the material being taught.

Dissemination Phase

The dissemination phase is designed to ensure that the product is not only well-developed but also ready to be widely and effectively used by a broader audience. Each stage, from validation testing to packaging, and finally diffusion and adoption, plays a crucial role in ensuring that the product provides maximum benefits to its users and can be seamlessly integrated into a wider context. The dissemination of the teaching materials involved providing the materials to the contributing schools and publishing an article in an accredited national journal.

CONCLUSION

The development of financial literacy teaching materials based on educational games involved several development processes using the 4D model stages: define, design, develop, and disseminate. Before conducting field trials, the materials were validated by media validators and subject matter experts, as well as language validators. The validation results obtained an average total score of 94.44%, indicating that the materials are highly valid or very appropriate. Once the materials were deemed suitable for use, field trials were conducted with sample classes to assess the practicality and effectiveness of the materials.

Before the learning sessions, both classes were given a pretest to determine the students' initial abilities before using the materials. After using the materials, students were given a posttest to assess their abilities after using the materials. Upon completion of the learning sessions, both students and teachers were given response questionnaires to evaluate the practicality of the materials. The response analysis revealed an average practicality score of 95.56% from teachers, 88.22% from students, and 88,63% from observations. Based on these averages, the teaching materials can be considered practical.

The analysis of the N-Gain Score test results showed that students' understanding improved. A total of 25 students, or 33.8%, were categorized as having high improvement, while 49 students, or 66.2%, were categorized as having moderate improvement. Overall, the average N-Gain score was 0.6594, which falls into the "moderate" improvement category. The effectiveness of using the game-based financial literacy teaching materials can be seen from the average N-Gain score of 65.94%, which falls into the "fairly effective" category.

This means that the game-based financial literacy teaching materials are proven to be fairly effective in improving students' financial literacy, particularly on the topics of banks and non-bank financial institutions.

SUGGESTIONS

Based on the development and testing of the game-based financial literacy teaching materials, several suggestions can be made for further improvement and enhancement:

1. Teachers are encouraged to create teaching materials on other topics utilizing the latest technologies such as augmented reality (AR) or virtual reality (VR) to increase interactivity and student engagement, thereby attracting attention and enhancing understanding.
2. Future researchers should consider conducting development research with more than two meetings during the trials to maximize student understanding.

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