Development of Web-Based Game Based Learning Media to Improve High School Students' Understanding of Concepts in Economics Subjects

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Abstract

Based on the low conceptual understanding of students in one of Surabaya's high schools in economics subjects, especially in conceptual materials, this study was conducted with the aim of developing a web-based learning media for snakes and ladders game based learning which is expected to be able to overcome these problems. The type of research used is research and development with the ADDIE by Dick and Carry development model (analysis, Design, Development, Implementation, & Evaluation). Product trials were carried out on a limited basis on 31 high school students using a One Group Pretest-Posttest trial design which was analyzed using n-gain score testing and paired sample tests. The results of the research analysis show that the developed media products are very worthy to use, are assessed well on effective learning indicators based on student responses, and can be implemented effectively to improve student learning outcomes. This indicates that the use of game-based learning media snakes and ladders can support the learning process which is followed by improved learning outcomes.

Keywords: Development; Learning Media; Game Based Learning; Snakes and ladders; Concept Understanding.

1. Introduction

Reaching learning goals is impacted by numerous factors, including the use of learning media. Learning media are tools or anything that is used to stimulate students' thoughts, attention, abilities and skills so as to encourage the learning process. (Syarifuddin. et al., 2022). By using learning media, there are many benefits that can be provided, such as stimulating students' creativity (Akbar et al., 2022), increasing learning motivation (Budiman et al., 2018; Elmunsyah et al., 2019), facilitating students to become multicompetent (Lisnawati, 2021), as well as improving students' high-level thinking abilities which is accompanied by improved learning outcomes (Rahim et al., 2022).

The author's observations at a high school in Surabaya show that economics teachers have used various media such as learning resources from YouTube, textbooks, the use of PowerPoint, and often provide practice questions to strengthen understanding of concepts. However, there are still many students who have not fully understood the conceptual material, especially the material main problems of economics and economic in terms of the final semester assessment results for class X (ten) which show that 79% of students have not reached the minimum score.

The author's interview with economics teachers shows that students' grades have not been maximized due to the lack of student involvement in learning, there are still many students who do not ask questions when they do not understand the material being studied. Another reason from the students' side is that they think that conceptual material can be studied easily so they do not study the material seriously. This condition is not justified because students must be able to understand the concept as a basis for moving on to the next material.

Based on this phenomenon, researchers suggest developing game-based learning media namely game based learning snakes and ladders. Game-based learning that not only creates games to be played, but also designs learning activities that can gradually introduce concepts and guide users or players to the final goal. The snakes and ladders game is categorized as game-based learning because it has three basic GBL structures, namely challenges, responses, and feedback. The characteristics of the snakes and ladders game indicate that the game is in accordance with the character of game-based learning, including (1) prioritizing competition, providing challenges, and motivating players to

learn better (2) there are fantasy elements in the game that involve players in learning activities, and (3) can create a real game which means that the material in the game is important for competition and assessment (Plass et al., 2015).

Research (Meriyati et al., 2019; Mufidah, 2023; Novita & Sundari, 2020; Petrus et al., 2023; Saputra et al., 2019; Treceñe et al., 2023) shows that the use of game-based learning media is like snakes and ladders could be an alternative solution to support the student learning process. The snakes and ladders game can accommodate the needs of students with a kinesthetic learning style through learning activities that involve practice in its use. The use of snakes and ladders media can help teachers carry out the teaching process in groups (Petrus et al., 2023), support the learning process during the K13 curriculum (Meriyati et al., 2019), improve learning outcomes (Mufidah, 2023; Novita & Sundari, 2020; Saputra et al., 2019), provides challenges according to competence, increases togetherness, and provides a learning space that is not boring (Treceñe et al., 2023).

Many snakes and ladders games have been developed, ranging from traditional or digital to support the learning process, but there are still shortcomings in being implemented today. The traditional snakes and ladders game requires good care so that it can be reused (Saputra et al., 2019), requires many duplicate products so that it can be played by all students in groups (Petrus et al., 2023), is still being developed in the form of practice questions or assessments only (Mufidah, 2023; Novita & Sundari, 2020), and is still being implemented in the K13 curriculum learning process (Meriyati et al., 2019). Treceñe et al., (2023) show that there has been an application-based snakes and ladders game. However, reviewing the snakes and ladders game on the genial.ly platform illustrates that the digital snakes and ladders media has shortcomings such as not being able to display more than one question so that if the next player passes the same question point then the player will answer the same question so it is not fair.

Based on this explanation, this research developed a web-based learning game based on leaning snakes and ladders to support the learning process for economic subjects, especially in the main problems of economics and economic systems material. The snakes and ladders game-based learning media in this research provides novelty (1) the development of the snakes and ladders game-based learning media does not use paper materials but is web based which can be accessed online and flexibly without intense

maintenance supported by the condition that all students studied have smartphones; (2) the development of snakes and ladders game-based learning media in this research is not only integrated as a snakes and ladders game containing questions but consists of three main aspects, namely providing material, a collection of questions in the snakes and ladders game, and discussion of questions; (3) there are two questions integrated into this media per question point. So this research aims to (1) determine the feasibility of web-based snakes and ladders game-based learning media; (2) analyze the effectiveness of using web based snakes and ladders game-based learning media; (3) improving student learning outcomes through the use of web-based game-based learning media; and (4) knowing students' responses to web-based game-based learning media.

2. Literature Review

2.1 Learning Media

2.1.1 Learning Media Concept

The concept of media certainly has a wide range of meanings, so this research is limited to those that are more relevant to learning, namely learning media. Consists of two words, namely the words "media" and "learning". The term "media" literally means an intermediary or introduction, while "learning" refers to a condition that assists someone in performing learning activities (Syarifuddin. et al., 2022). Learning media encompasses anything that can be used to convey messages so as to stimulate students' attention, interest, thoughts, and emotions during learning activities to achieve learning goals. Learning media is a means to achieve learning goals which contain information originating from the internet, books, films, television, and so on (Kristanto, 2016). Learning media can be said to be a component of learning resources or physical vehicles that contain instructional material in the student environment that can stimulate students to learn.

2.1.2 Benefits of Learning Media

Based on previous research, the various benefits of learning media include (1) facilitating students to become multicompetent, critical thinkers, and innovative which improves learning outcomes (Lisnawati, 2021), (2) influencing learning effectiveness with a relationship that is moderated by learning domain and style. student learning

(Sahasrabudhe & Kanungo, 2014), (3) supporting the learning and teaching process (Scheiter, 2021), (4) increasing students' enthusiasm and high-level thinking abilities which results in better learning outcomes (Rahim et al., 2022), (5) stimulate student creativity (Akbar et al., 2022), (6) produce high student learning motivation (Budiman et al., 2018; Elmunsyah et al., 2019), and (7) if learning is developed from various media platforms have the potential to improve learning outcomes beyond those from a single medium (Fisch, 2013).

2.1.3 Types of Learning Media

Learning media can be divided into two categories based on their existence, namely media by design and by utilization (Syarifuddin. et al., 2022). Learning media by design is a type of media that is deliberately created and designed for specific learning purposes. Meanwhile, media by utilization refers to existing media, both those sold on the market and those available in the learning environment.

In terms of shape and physical characteristics, media is grouped into four types (Kristanto, 2016) namely two-dimensional learning media, three-dimensional learning media, still viewing media, and moving viewing media. The learning media product developed in this research is classified as a media by design type because it was deliberately created for the purpose of increasing students' understanding of concepts, and is classified as a moving viewing media because it can be used via projection media, smartphones or laptops and the display can move.

2.2 Game Based Learning

2.2.1 Definition Game Based Learning

Game based learning (GBL) context refers to the use of certain game principles applied in a learning environment by involving students (Trybus, 2015). The motivational psychology involved in game-based learning enables students to engage with learning materials in an enjoyable and dynamic manner. Game based learning involves not only creating games for entertainment but also designing educational activities that gradually introduce concepts and guide users or players toward the final goal. (Pho & Dinscore, 2015). Game based learning is an innovative teaching method that integrates education and games. Combining learning elements in games, such as motivation, interest,

curiosity, challenge and feedback with learning content to achieve an easy and fun learning effect like playing games.

2.2.2 Characteristics of Game Based Learning

Proposed by Plass et al. (2015), three characteristics of game based learning are as follows. (1) Game based learning prioritizes competitiveness in student abilities, provides challenges for students, and motivates students to learn better (2) there are fantasy elements in game based learning which involve players in learning activities (3) creating real games, The instructor (teacher) can ensure that the material is important for competitions and assessments.

Game based learning has advantages and disadvantages in its implementation. In terms of advantages, GBL can make students more active in learning, make students interact directly in learning, teachers can provide evaluations to students directly, games can make a strong impression and are easy for students to remember, foster a sense of comfort, interest and fun in learning. Meanwhile, in terms of disadvantages, GBL requires more tools and instruments, sometimes it makes the class atmosphere less conducive, it takes longer, preparations and steps must be prepared carefully and tested first, and sometimes it makes the atmosphere more active but causing a commotion.

2.2.3 Game Based Learning Design Model

There is a simple model that outlines the basic structure shared by almost all games. This structure consists of three key elements: challenge, response, and feedback. A loop is generated when feedback becomes a new challenge, prompting players to provide a different response to the initial challenge. This model illustrates how game design features (such as incentive systems, game mechanics, aesthetic design, narrative design, and musical score) become central to the learning experience. Students will understand how challenges, responses and feedback are given so that they have a different learning experience.

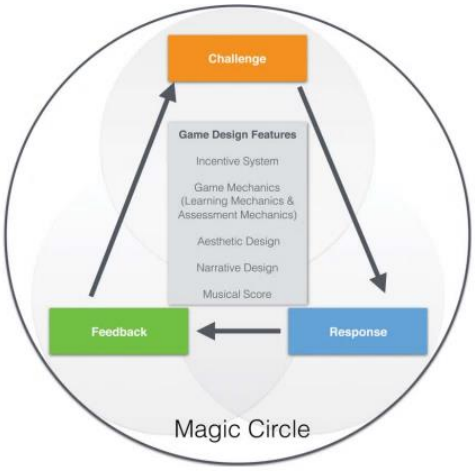

Figure 1. Game Based Learning Design Model

Source: Plass et al., (2015)

2.2.4 Snakes and Ladders Game as Game Based Learning

The game of snakes and ladders was originally known as an ancient Indian game used to teach moral messages to children, known as Mokshapat or Moksha Patamu. However, as time progressed, this game began to be adapted by many other countries and used as a learning media. The snakes and ladders game can be said to be game based learning because it is in accordance with the character of GBL as presented by Plass et al. (2015), namely (1) prioritizing competitiveness in students' abilities, providing challenges for students, and motivating students to learn better (2) there are fantasy elements in the snakes and ladders game which involves players in learning activities, and (3) can create a real game which means that the material in the game is important for competition and assessment. Apart from that, the snakes and ladders game is categorized as a game based learning because it has a basic structure as a key element in GBL, namely challenge, response and feedback.

2.3 Concept Understanding

2.3.1 Definition Concept Understanding

Conceptual understanding refers to understanding ideas that are integrated and functional. Students who possess strong conceptual understanding comprehend more than just isolated facts and methods. They grasp the significance of ideas and their relevance within specific contexts. Conceptual understanding aids in retention as facts and methods learned with comprehension are interconnected, making them easier to recall and apply,

and can be reconstructed if forgotten (Bruner et al., 1966). Genwise.in shows that there are at least two reasons why conceptual learning is important, namely (1) it provides a strong foundation on which to build further learning, (2) achieving conceptual understanding requires active involvement on the part of students, and this builds the ability to think from first principles.

2.3.2 Measuring Conceptual Understanding

One way to measure students' understanding abilities is to use test instruments. The test instrument is considered capable of accommodating any material that has been taught by teachers to students during learning in the form of questions (Perdana, 2018). In this research, a test instrument was developed on the main issues of economics and economic systems with 20 questions. The questions used are of good quality so they are able to provide accurate information about which students have or have not mastered the material taught by the teacher. The following is a grid of test instruments used in the pretest and posttest.

Table 1. Test Instrument Grid

No	Indicator	Cognitive Bloom
1	Identify the main economic problems in general, classic and modern	C1, mentions
2		C1, mentions
3		C3, classify
4		C4, analyze
5	Distinguish between the main problems of classical and modern economics	C4, analyze
6		C3, classify
7		C2, exemplifies
8		C4, concluding
9	Explain the meaning of an economic system	C1, identify
10	Shows the factors that influence the economic system adopted by a country	C1, identify
11	Explain the function of the economic system in the economy	C2, explains
12	Identify various types of economic systems	C4, analyze
13		C4, analyze

14		C2, categorize
15		C4, analyze
16	Identify the characteristics, strengths and weaknesses of each economic system	C2, characterize
17		C2, characterize
18	Explain the economic system in Indonesia	C4, analyze
19		C4, analyze
20		C1, mentions

3. Material and Method

3.1 Design Study

This research is a type of Research and Development (R&D) research. The research method used to produce a particular product then tests the feasibility and effectiveness of the product (Sugiyono, 2013). In this research, the product tested for feasibility and effectiveness was the web-based snakes and ladders game-based learning media.

The model used is the ADDIE development model by Dick and Carry which consists of 5 stages, namely analysis, design, development, implementation, & evaluation. The development procedures in this research include (1) Analysis, namely the initial stage consisting of performance analysis and needs analysis. Performance analysis is carried out to clarify the problems faced by first reviewing performance conditions and then carrying out a needs analysis by reviewing deficiencies or obstacles that occur. The facts that emerge are then analyzed and continued by formulating a solution to the problem through media development. (2) Design, namely the design stage. Researchers create a media product design (wireframe) based on the results of the analysis in the previous stage. At this stage, pretest-posttest sheet test instruments were also prepared, material expert and media expert validation instrument sheets were prepared to assess the suitability of the media, as well as preparation of expert evaluation validation sheets to assess the suitability of the pretest-posttest sheet questions. (3) Development, namely the stage to turn the wireframe into a media product that is ready to use, can be validated by experts, has been revised and is ready to be tested on students. (4) Implementation, namely the stage of testing the product with students. (5) Evaluation, namely the evaluation process to measure product achievement or success of media development objectives.

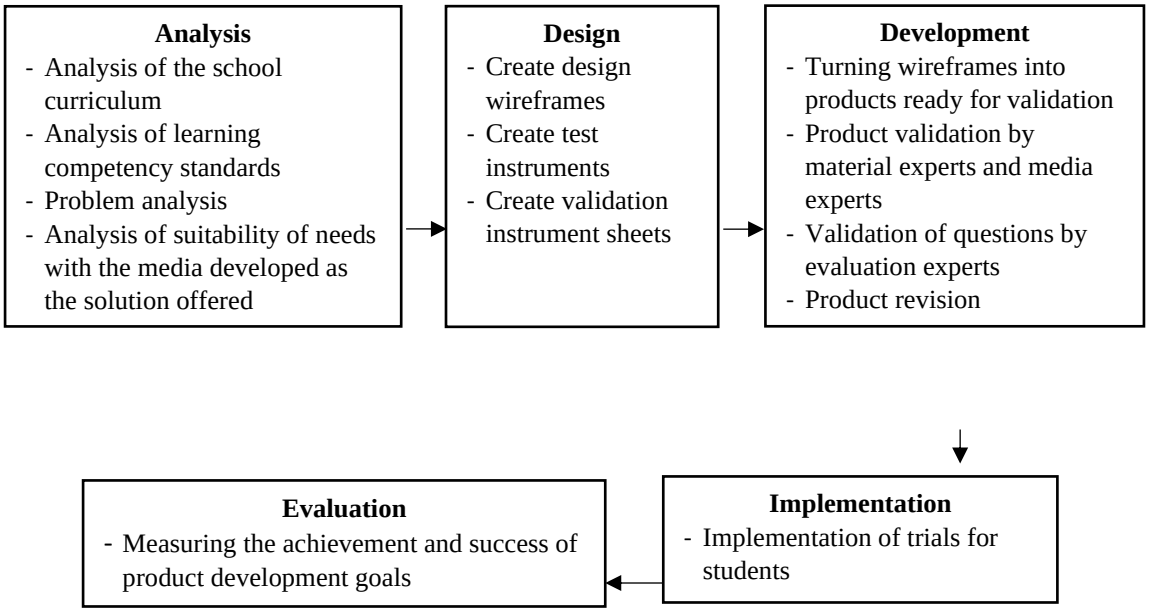

Figure 2. Development Model

Research on the development of web-based game-based learning media uses the One Group Pretest-Posttest trial design model. The research model is in one group which is given a pretest before treatment and a posttest after treatment to observe differences in students' cognitive outcomes before and after using media as treatment (Sugiyono, 2013). This design model helps researchers to study one group with one treatment and one measurement so that the time required is relatively short.

Table 2. Trial Design

Pre-test	Treatment	Post-test
O1	X	O2

Information :

O1: pre-test score before treatment

O2: post-test score after treatment

X : treatment given through web-based snakes and ladders game-based learning media

The trial subjects for this media development were 31 class X (ten) students at a high school in Surabaya with students who had heterogeneous abilities. The selection of

research subject took into account the results of the final semester assessment on conceptual material which is still low, namely on the main economic problems and economic systems.

The instruments used for data collection consisted of expert validation sheets, pretest-posttest question sheets, and student response questionnaires. (1) The expert validation sheet consists of a material expert and media expert validation sheet to assess the suitability of the material and the suitability of the media, as well as an evaluation expert validation sheet to assess the suitability of the questions to be used in the pretest-posttest. (2) The pretest-posttest question sheet as a data collection instrument will be filled in by students before and after media use treatment. This data collection serves to assess the achievement of learning objectives and the effectiveness of the media that has been developed. (3) student response questionnaires are used to determine students' assessments of the media after testing with students.

3.2 Data Analysis

The types of data used in research are quantitative and qualitative. Quantitative data was obtained from the assessment scores of material experts, media experts, evaluation experts, student pretest-posttest results, and student response assessment scores. Meanwhile, qualitative data is in the form of criticism and suggestions given by the validator as a consideration for revising the product.

Data on the feasibility of the resulting product is determined through analysis of validation results from material experts and media experts, which is said to be feasible if a percentage of ≥ 61% is obtained. The feasibility of the questions produced through expert evaluation validation results can also be said to be feasible if the percentage is ≥ 61%. The data results use interpretation as in table 3.

Table 3. Validation Score Interpretation Criteria

Perolehan Skor	**Criteria**
81% - 100%	Very worthy
61% - 80%	Worthy
41% - 60%	Decent enough
21% - 40%	Not feasible

0% - 20%	Not really worth it

Source: Riduwan (2015)

Next, the pretest-posttest data were analyzed using gain score calculations, then normality tests and t tests. Meanwhile, student response questionnaires are used to view product assessments by counting the number of positive and negative responses from students. The questionnaire used in this research was developed based on indicators of effective learning presented by Bistari, (2018). Based on the responses of media students, it can be said to be good if they have a score in the range 75 ≤ score < 85 with the interpretation as in table 4.

Table 4. Student Response Scoring Criteria

Score Acquisition (scale 0-100)	**Crtiteria**
85 ≤ skor ≤ 100	A (Very good)
75 ≤ skor < 85	B (Good)
60 ≤ skor < 75	C (Fair)
50 ≤ skor < 60	D (Less)
0 ≤ skor < 50	E (Very poor)

Source: Bistari (2018)

4. Result

The management of high school education in Surabaya already uses the independent curriculum. The independent curriculum emphasizes a focus on essential content, character development, and learning flexibility. In its implementation, the independent curriculum can be applied to the selection of media to support the learning process. In one class X (ten) of high school in Surabaya, it was shown that economics teachers had used various media such as learning resources from YouTube, textbooks, the use of PowerPoint, and often gave practice questions to strengthen understanding of concepts.

The learning competency standard or learning achievement in economics subjects in class X (ten) is that students are able to understand the basic concepts of economics, main

economic problems, and the economic system as a way of organizing various economic activities so that students can solve their economic problems efficiently and responsible.

However, reviewing the results of the final semester assessment shows that 79% of X (ten) students in the class studied still did not reach the minimum score. Analysis of the final semester assessment results shows that students have difficulty understanding conceptual material, especially the main problems of economics and economic systems.

Interviews with economics teachers show that students' achievement of grades has not been maximized due to the lack of student involvement in the learning process, there are still many students who do not ask questions when they do not understand the material being explained. Another reason from the students' side is that they think that conceptual material can be studied easily so that students do not study the material seriously.

Based on these conditions, researchers collected information on student learning styles. The results of reviewing student learning styles in this class showed that 53.6% of students had a kinesthetic learning style, 25% had a visual learning style, 14.3% had a reading or writing learning style, and 7.1% had a preference for an auditory learning style. The data shows that most students have a kinesthetic learning style or are interested in exploratory or practical learning processes as seen in Figure 3. This reason is the author's main concern in developing web-based snake and ladder game-based learning media.

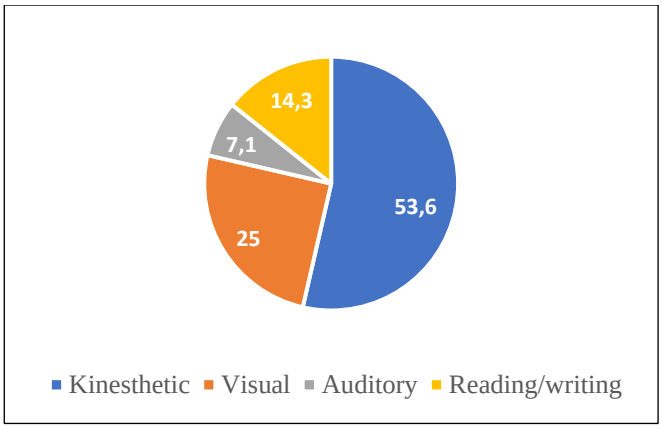

Figure 3. Student Learning Style

Snakes and Ladders game-based learning media is a web-based media that can be used online and repeatedly according to students' understanding needs. This media is called EKOLAGA (Ekonomi Ular Tangga Digital) which can be accessed using

smartphones and laptops via the website https://bit.ly/EkolagaAsEkonomiUlarTanggaDigital. The use of web-based media is supported by the condition that all class X (ten) students in high school have smartphones and the majority have laptops. The product design was developed via the Figma platform with a wireframe illustration as in Figure 4.

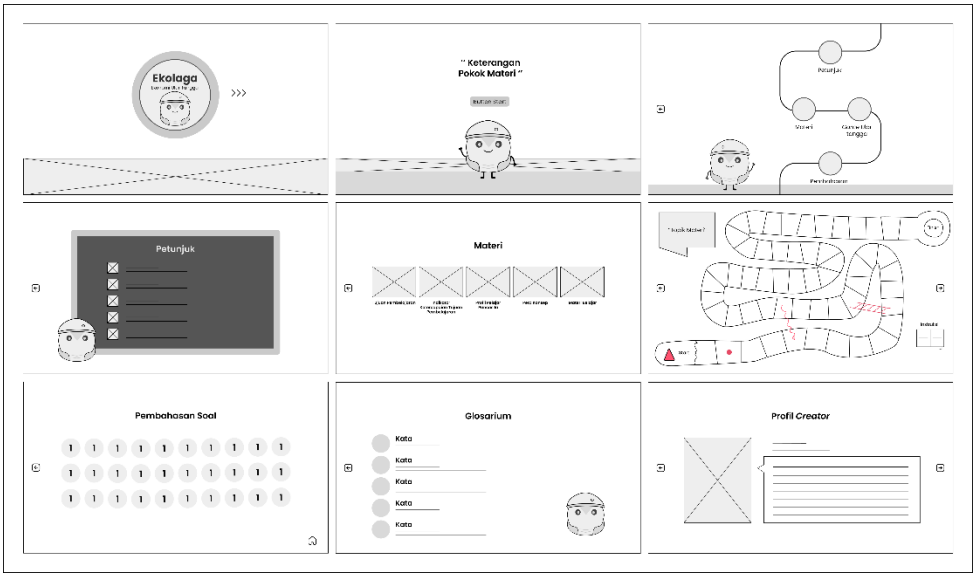

Figure 4. Wireframe or Media Design Plan

The primary color used in the media is blue-green. This color was chosen because it suits students' needs when studying. The author's analysis shows that this color was created due to a combination of 3 colors, namely 48% blue, 42% green and 9% red. These colors have a good role in the learning environment, such as blue which means driving productivity, green which means calming concentration, and red which means giving energy. The implementation of blue-green as the primary color in the media can be seen in Figure 5.

Figure 5. Final Media Design

The media website page that has been opened for the first time will display an onboarding screen which, when you click start, will switch to the home screen display. In this section, users are presented with six menus, namely the instructions menu, material menu, snakes and ladders game menu, question discussion menu, glossary menu and profile menu.

After turning the wireframe into a product ready for validation, the media will be validated by material experts and media experts. Assessment is carried out through product validation sheets by providing suggestions and grades according to a Likert scale. The assessment uses a rating scale of 1 to 5 with a maximum value of 5. Validation is carried out twice. The first validation shows that the product must be revised in accordance with the suggestions obtained, namely (1) it is necessary to highlight the examples in the material, (2) there must be reference source information, (3) it is better to replace the description of the "instruction menu" with "button info", (4) there needs to be information that identifies the cognitive level of each question discussed, (5) the use of the home button in some menus is better replaced by the next button, (6) images, color combinations and font size need to be improved to be clearer.

Based on the suggestions obtained, the product is revised and then validated again. The results of the second validation, by material experts, obtained a percentage of 94.6% as in table 5, with media experts at 91.3% as seen in table 6. The validation results of

material experts and media experts showed an overall score obtained of 92.9% which indicates that the media that has been developed is very worthy for use.

Table 5. Material Expert Validation

Assessment aspect	Score obtained	Highest score	Percentage
Content quality	23	25	92%
Quality of learning	24	25	96%
Linguistic quality	24	25	96%
Percentage average	71	75	94,6%

Table 6. Media Expert Validation

Assessment aspect	Score obtained		Highest score	Percentage
	V1	V2		
Programming	20	20	20	100%
Visual communication	13	13	15	86%
Technical design	36	35	40	88,7%
Percentage average	69	68	75	91,3%

The aim of carrying out product trials is to obtain responses and learning outcomes of students after using the web-based snakes and ladders game-based learning media. The researcher acted as the learning implementer with 31 students at one high school in Surabaya as a sample. At the beginning of learning, students are asked to fill out a pretest, then given treatment through the use of media and asked to fill out a posttest and student response questionnaire.

To measure the ability of learning media to improve students' understanding, a trial was carried out by giving a pretest and posttest containing 20 questions on basic economic issues and economic systems. Before the questions are given to students, the questions are tested for suitability by an evaluation expert. The validation results by evaluation experts show that the pretest-posttest is very worthy for use with an assessment of 93.3% as in table 7.

Table 7. Pretest-Posttest Validation by Evaluation Experts

Assessment aspect	Score obtained	Highest score	Percentage

Material	20	20	100%
Construction	18	20	90%
Language	18	20	90%
Percentage average	56	60	93,3%

Analysis of students' level of understanding was carried out by testing pretest-posttest learning result data using gain score analysis, normality test, and t test as follows.

Gain Score

The gain score results obtained were ≥ 0.3, which has moderate criteria as in table 8. Based on the gain score, it can be seen that student learning outcomes as measured through pretest-posttest scores show an increase in understanding of the material. This indicates an increase in students' understanding of concepts.

Table 8. Gain Score Result

	Pretest	**Posttest**	**Gain Score**
Amount	1175	2435	0,65
Average	37,9	78,5	

Normality Test

Normality testing was carried out using the Shapiro-Wilk test with the support of SPSS version 29 software. This analysis aims to determine whether the pretest and posttest data collected by the researcher are normally distributed or not. Data are considered normally distributed if the significance value (α) from the Shapiro-Wilk test is > 0.05. Conversely, data is considered not normally distributed if the significance value α is < 0.05. The results of the analysis show that all data from the pretest and posttest results are normally distributed with an α value > 0.05 as in table 9.

Table 9. Normality Test

Test of Normality			
	Shapiro-Wilk		
	Statistic	df	Sig.
Pretest	.899	31	.007

Posttest	.958	31	.260

t Test

The t test was carried out with the help of SPSS version 29 software. This stage aims to assess the effectiveness of increasing students' understanding through the results of the pretest and posttest. If the data results show a significance value of $\alpha > 0.05$ then the media can be said to be ineffective in increasing students' understanding, whereas it can be said to be effective if it has a significance value of $\alpha < 0.05$. Based on the results of table 10, it shows that the web-based snakes and ladders game-based learning media is effective for increasing students' conceptual understanding because the significance value obtained shows $\alpha < 0.05$.

Table 10. t Test

Paired Samples Test										
		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	Pretest - Posttest	-40.645	13.524	2.429	-45.606	-35.684	-16.733	30	<,001	<,001

The next analysis was carried out based on the student response questionnaire. The response questionnaire is used to see product assessments from students by counting the number of positive and negative responses obtained. The questionnaire used in this research was developed based on indicators of effective learning presented by Bistari, (2018). Web-based game-based learning media development products are known to be rated good with an average rating of 79.74% as in table 11.

Table 11. Student Response Results

Assessment Aspects	**Percentage**

Management of learning implementation	82,74%
Communicative process	79,68%
Student response	80,48%
Learning activities	79,03%
Learning outcomes	76,77%
Percentage average	79,74%

5. Discussion

Description of Web-Based Game Based Learning Media

The development of the web-based snakes and ladders game-based learning media or what is called Ekolaga was developed in accordance with the results of performance analysis and analysis of the needs of schools and students. The material contained is the material studied in class X (ten) semester 1, namely the main problems of economics and economic systems. The learning material provided is provided with contextual examples so that it is easy for students to understand. Apart from that, the practice questions provided are developed with various types of questions, including Low Order Thinking Skill (LOTS), Middle Order Thinking Skill (MOTS), and Higher Order Thinking Skill (HOTS) to hone students' thinking skills.

The game based learning design developed in this media has three basic structures as key elements of GBL, namely challenge, response and feedback. Challenges are obtained when students try to play snakes and ladders according to the rules and try to quickly reach the finish point, responses are obtained when students discuss with groups to answer questions, and feedback is obtained when students receive explanations of answers to questions given through the question discussion menu.

The snake and ladder game based learning game in this study was developed after reviewing previous research which showed that the traditional snake and ladder game requires good maintenance so that it can be used again (Saputra et al., 2019), requires many duplicate products so that it can be played by all students in groups (Petrus et al., 2023), is still being developed in the form of practice questions or assessments only (Mufidah, 2023; Novita & Sundari, 2020), and is still being implemented in the K13 curriculum learning process (Meriyati et al., 2019). Treceñe et al., (2023) show that there

has been an application-based snakes and ladders game. However, reviewing the snakes and ladders game on the genial.ly platform illustrates that the digital snakes and ladders media has shortcomings such as not being able to display more than one question so that if the next player passes the same question point then the player will answer the same question so it is not fair.

The characteristics of snakes and ladders game-based learning media in this research include (1) media with the snakes and ladders game which does not use paper but is web-based so it is more flexible because it can be accessed anytime and anywhere and can be used repeatedly as needed. students' understanding, (2) media with game based learning which not only provides the snakes and ladders game which is integrated with questions but also provides a menu of learning materials and a question discussion menu, and (3) the questions available in the snakes and ladders game consist of two at each question point. so it is fairer when played.

The limitations in the development of Ekolaga media are (1) users must be connected to an internet network in order to access the media, (2) it is recommended that media users use a laptop because the tooltip feature cannot appear on smartphones, and (3) the material loaded on Media is still available only on basic economic issues and economic systems, so it is hoped that researchers or anyone who uses this as an opportunity can carry out extensive trials with various material content or other methods that can be combined.

Feasibility of Web-Based Game Based Learning Media

The results of Ekolaga media development were assessed by 1 material expert and 2 media experts. The assessment by material experts includes aspects of content quality, learning quality and language quality, showing that the media is very worthy for use with a score of 94.6%. Assessment by media experts containing aspects of programming, visual communication and technical design shows that the media is very worthy for use with a score of 91.3%. So it can be concluded that the web-based snake and ladder learning game media is very worthy for use with an average overall score of 92.9%.

Effectiveness of Web-based Game Based Learning Media

The use of Ekolaga media has an impact on the learning process. Before being given treatment, it showed that students' conceptual understanding of the main economic issues and the economic system was very low, as evidenced by the pretest data obtained that most students did not reach the minimum score. However, after the treatment, it was discovered that the application of the web-based snakes and ladders game-based learning media could increase students' conceptual understanding as evidenced by the posttest result data obtained by the students. This is supported by the results of the gain score analysis which obtained a value of 0.65 indicating that there was an increase in students' understanding of concepts because the gain score value was ≥ 0.3 and the t test results were <.001 which means $\alpha < 0.05$ which indicates that the media The web-based snake and ladder learning game is effectively used to increase students' understanding of concepts.

Student Responses to Web-based Game Based Learning Media

The results of student responses were obtained through student response questionnaires which were given after students used Ekolaga learning media. Assessment by students contains indicators of effective learning which consist of aspects of managing learning implementation, communicative processes, student responses, learning activities, and learning outcomes. Based on the results of student responses, it is known that Ekolaga media is rated as good with an average rating of 79.74% with a score for each aspect, namely 82.74% in the management aspect of learning implementation, 79.68% in the communicative process, 80.48% in the response students, 79.03 in the learning activity aspect and 76.77 in the learning outcomes aspect.

Based on the questionnaire responses that have been filled out by students, the feedback given is in the form of comments and suggestions. Several students said that the media developed was quite good in terms of appearance but still needed to be designed by providing images that looked more real, students said that this media was able to help the learning process for those who like the learning process while playing.

6. Conclusion, Implication, and Recommendation

The web-based snakes and ladders game-based learning media or EKOLAGA (Ekonomi Ular Tangga Digital) has been assessed for product feasibility by material

experts and media experts who obtained an overall score of 92.9% indicating that the media that has been developed is very feasible to use. The results of the gain score analysis obtained a value of 0.65 and the results of the t-test analysis obtained a result of <,001 which means α <0.05 indicating that there was an increase in students' conceptual understanding and indicating that the use of web-based snake and ladder game-based learning media is effective for use in improving students' conceptual understanding. Based on the student response questionnaire, the product of the development of web-based game-based learning media is known to be assessed well based on effective learning indicators with an average assessment of 79.74%.

The practical implications of this study include 1) for students as research subjects, it is expected to gain direct experience regarding learning with the game-based learning method. Students can be interested in studying economics so that students' conceptual understanding can improve, 2) for educators and prospective educators, it increases knowledge and contributes ideas about improving conceptual understanding through game-based learning, 3) for schools, it is a consideration in compiling learning programs, methods, and appropriate media to develop students' conceptual understanding abilities, 4) for education policies, it is a consideration in implementing game-based learning media in the independent curriculum, especially snakes and ladders to bridge students with kinesthetic learning styles so that they can learn optimally.

The limitations of this study are in the use of the One Group Pretest-Posttest Design trial design model. The use of this model has weaknesses such as the absence of a control group and still has the potential for bias in measurements before the intervention, so that the recommendation for further research is to conduct trials using a trial design model that has an intervention group. In addition, the recommendation for further research is to conduct broader trials with various material loads or other methods that can be combined.

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