Randwick International of Education and Linguistics Science (RIELS) Journal
Vol. 5, No. 2, June 2024 | Page 522-534 |
https://www.randwickresearch.com/index.php/rielsj

Development of Linktree-Based Interactive Learning Media to Improve History Learning Outcomes

DOI: *https://doi.org/10.47175/rielsj.v5i2.988*

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ABSTRACT

The aim of this research is to produce Linktree learning media products aimed at testing aspects of the feasibility, practicality, and effectiveness of Linktree-based interactive learning media to improve history learning outcomes in class XI MAN 2 Medan Model. The research and development method used is the ADDIE model. The research results show: (1) The material expert validation test is very feasible with 93.75%. (2) The validation test for media experts is very feasible at 95%. (3) validation test of learning design experts in the very feasible category with 100%. (4) Individual trials in very feasible criteria with 83.92%. (5) The small group trial criteria were very feasible, with 89.83%. (6) Field trials met very feasible criteria with 94.06%, with an overall average result of 93.02%. Then the results of the experiment using Linktree-based interactive learning media using the problem-based learning model approach in the experimental class had an average learning outcome of 89.9, while using Linktree-based interactive learning media with the cooperative learning jigsaw model approach in the control class had an average value of 83.8. Based on the independent T-test, the effectiveness test showed a Sig value. (2-tailed) 0.000 is <0.05, which means it is significant. It was concluded that the Linktree-based interactive learning media with the problem-based learning model approach was effectively used to improve history learning outcomes. Based on the N-Gain calculation, a result of 60.96 was obtained in the quite effective category.

KEYWORDS

linktree; Problem Based Learning; history learning outcomes

INTRODUCTION

History subjects cover a very large scope of material, especially in the scope of material "Indonesian National Movement" in phase F, so students often have difficulty associating and remembering historical information when taught by educators because it still relies on educators. There is a lack of innovative use of learning media, a lack of learning models that are commensurate with student criteria, and a and a lack of learning activity resources and learning infrastructure. The above ultimately leads to learning activities not being interesting enough and students not being enthusiastic enough when the teacher delivers the material "Indonesian National Movement," so that boredom arises, as can be seen from the low category history learning results. The decline in student learning outcomes is a problem that needs to be addressed. The material on the Indonesian national movement is very important for students to understand, which is not only to develop historical awareness and national integrity but can also develop students' sense of nationalism and patriotism.

History is a note or recording of events that occurred in the past. In the history dictionary, the term history is derived from Arabic, namely syajaratun, which means tree. The meaning of the tree in question is that it is a hereditary or genealogical tree. Scientifically, history is about events about what happened in the past (Suharso & Ana, R. 2022). Meanwhile, according to Martha et al. (2023), history is a field of science that investigates past events, the evolution of society, and human interactions.

History is less fun, less interesting, boring, and does not provide enthusiastic learning in the learning process because, during history lessons, a lot of it is presented with a focus on teacher activities and a lack of use of interactive learning media. This affects student learning outcomes. As is known from various reviews, learning outcomes can be expressed cognitively, skillfully, and affectively, as well as through historical learning outcomes.

In the context of history learning, Linktree can be used to provide easy access links to various historical supporting resources, such as text, images, videos, audio recordings, and related websites. By using Linktree, students can explore various historical content in a structured and directed manner. The links that will be used on the Linktree platform as learning media can be obtained from Google Drive, YouTube, and the Wordwall application. Linktree as an interactive learning media tool is not enough. It is important to adopt appropriate learning approaches to ensure the effectiveness of history learning outcomes. The learning approach that can be utilized in this context is applying the problem-based learning model, hereinafter abbreviated to PBL.

Problem-based learning is a learning approach that focuses on problem solving as the basis for learning. In PBL, students are given authentic problems that are relevant to historical contexts and require critical thinking, analysis, research, and collaboration to achieve good solutions. By bringing PBL into history learning, students not only learn historical facts, but in addition, they improve their ability to think critically, analytically, research, and collaborate, which are needed to understand complex historical contexts and face challenges. Related research using the problem-based learning approach in history subjects was carried out by Utami (2021) with the title Problem-Based Learning Model to Improve Thematic Learning Outcomes in Social Sciences Lesson Content. Referring to the research results, it can be seen that in cycle I, the achievement of social studies learning outcomes was 63.07 percent with a high level; in cycle II, it rose to 80.76 percent with a very high level. Thus, there was an increase of 17.69 percent in the learning outcomes of social studies subject content. This means that the use of a problem-based learning model can improve social studies learning outcomes.

According to Wijiatun and Indrajit (2022), teachers are managers of learning approach process activities that support student development in order to gain knowledge in order to achieve learning goals. Furthermore, Maemunawati and Alif (2020) stated that teachers, as facilitators, must provide comparable learning media to encourage learning activities. Media that captivates students will increase their excitement in the learning process and enable smoother interactions.

Slameto (2018), Learning is an effort made by a person to change his overall behavior based on his experiences with his environment. Furthermore, according to Wijiatun & Indrajit (2022), learning is a process of changing behavior from not understanding to understanding as a result of experience, practice, or practice. Meanwhile, according to Yamin (2020), learning is a dynamic process of building a better life so that you can understand the realities that occur around you by mobilizing the potential and talents of the learners.

History is made part of the subjects in high school and above, including at Madrasah Aliyah Negeri 2 Medan Model, by displaying the characteristics of history learning, which

are bound by the dimensions of humans, space, and time. In accordance with these historical characteristics, there is great potential in developing character education that has a sense of nationality and love for one's homeland, which manifests in the emergence of an attitude of nationalism, making history learning very important to implement. In line with what Rulianto (2018) stated, history learning can help students interpret the relationship between current and past events. They also have the ability to learn how steps and actions chosen in the past impacted their own lives and apply this knowledge to the context of their own lives.

According to Martha et al. (2023), through learning history, students can improve their abilities in analysis and problem solving, increase multicultural awareness, and increase their understanding of identity and nationality. Apart from that, this gives students the opportunity to develop the potential to think critically, assess, and understand broader concepts. Furthermore, according to Aman (2020), effective history learning can help students strengthen moral values, deeper understanding, and critical thinking skills. This potential for critical thinking also helps them understand the meaning of history, both national and global.

According to Anwar et al. (2022), media are tools or materials used to enable educational communication between teachers and students or between facilitators and participants. The aim of this medium is for this interaction to take place interactively in accordance with the learning plan that has been determined. Meanwhile, according to Rusli et al. (2017), media is also referred to as a carrier of information or messages from the source to the recipient. If the message aims to change the recipient's behavior, the media is called learning media.

Classification of types of learning media that can be applied to history learning activities according to Ropi'i (2021), namely: (1) graphic/visual media, (2) text and documents, (3) audio, (4) audio-visual, and (5) multimedia With the increasing development of technology in the current era, it is possible for a teacher to develop the available media, such as the types of website media that are currently emerging. One example is the development of Linktree web media. According to Asela (2020), interactive learning media includes everything, both software and hardware, functioning as an intermediary for sending educational materials from learning resources to students using methods to enable users to respond well to what has been included in the media.

Linktree is a tool that can be used to combine lesson plans, quizzes, materials, and other learning components with each other via links. As stated by Zulfakar, Sakti, H., and Mustamin, M.Z., Linktree is an interactive web-based media that is also easy to use for beginners; just embed material, attendance, quizzes, etc. for free on any social media platform such as WA, Instagram, Twitter, Facebook, and others (Hanim, 2021).

Firda and Rachmadyanti (2022) Linktree-based learning on the internet functions as a place to store lessons, archive various pieces of information, and provide creative learning via the internet. It can be accessed by users from anywhere and at any time via 28 computers or cellphones.

The interactive learning media that will be developed by researchers is PBL-based Linktree learning media to improve history learning outcomes because the integration between Linktree and the PBL model is effective learning to support 21st century education. This is in line with what was stated by Tan (2021). The successful merger of PBL models and e-learning seems to offer a promising path for innovation in education and training. The inventive blend of in-person guidance and technological intervention will define learning in the upcoming era. “Effective integration of PBL and e-learning models seems to be a promising way of innovation in education and training. Creative

combinations of face-to-face mediation and technological mediation will be a feature of learning in the future."

The formulation of the research problem is: (1) What is the feasibility of developing PBL-based Linktree interactive learning media for use in history learning; (2) How is the practicality of PBL-based Linktree interactive learning media used in history learning; and (3) How effective is the development of PBL-based Linktree interactive learning media to improve history learning outcomes?

RESEARCH METHODS

This research was carried out at the MAN 2 Model Medan location, on Jalan Willieam Iskandar No. 7-A, Medan Tembung. This research was carried out in class XI, phase F, TP 2023–2024. The subjects of this research were class XI students, who were divided into trial classes, control classes, and experimental classes, for a total of 90 students. Other research subjects are history subject teachers as users of Linktree Media and a team of validation experts as a team to test the suitability of Linktree Media.

This research utilizes a research-and-development approach. (Research and Development) with the ADDIE development model, which consists of five main stages: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation.

According to Tung, Khoe Yao (2016:59 a), ADDIE is often carried out in learning communities that have been created with the aim of learning. ADDIE learning tools are aimed at achieving effective learning. ADDIE helps resolve complex obstacles and develop educational and learning outcomes with models and stages.

The Needs Analysis Questionnaire aims to gain an understanding of the perspective of teachers' and students' needs regarding the use of learning media in the classroom. The questionnaire instrument for analysis of teacher needs can be seen in Table 1, and the questionnaire instrument for analysis of student needs can be seen in Table 2.

Table 1. Teacher Needs Analysis Instrument Grid

No	Question
1	Has the implementation of learning material on the Indonesian National Movement so far run optimally according to your expectations?
2	Is learning well structured in formulating objectives, selecting models, media, teaching materials, assignments and assessments?
3	Have you used Lintree-based media in history learning?
4	Do you agree that when learning material for the Indonesian National Movement using Lintree-based learning media?
5	Do you agree that learning using Linktree-based media through Problem Based Learning can improve History learning outcomes?

Table 2. Student Needs Analysis Questionnaire Instrument Grid

No	Question
1	Do you like studying history?
2	Is the history lesson delivered by the teacher enjoyable and easy for you to understand?
3	Do you agree that without learning media the teaching and learning process is very boring?
4	Has the teacher used Lintree media in teaching history?
5	Do you agree that when studying history the Indonesian National Movement material uses Linktree media?
6	Do you agree that learning using Linktree media can improve history learning outcomes?

Table 3. Grid of Learning Material Expert Assessment Instruments

No	Assessment Aspects	Indicators/Assessment Items
1	Eligibility of content	Suitability of material to learning outcomes (CP) and learning objectives (TP)
		Material accuracy
		Up-to-date material
2	Feasibility of presentation	Accuracy in the order of presentation of material
		Supporting the presentation of material
3	Contextual assessment	Contextual nature
		Contextual components
4	Learning uses a problem based learning module	Student involvement and role in learning activities

Source: Afriyose (2022)

Table 4. Assessment Instrument Grid for Learning Media Experts

No	Assessment Aspects	Indicators/Assessment Items
1	Instructions/guide	Clarity of information and guidance on how to use Linktree media
		The attractiveness of the instructions/study guide component
2	Quality of media conter	Conformity of media content with CP. T.P. ATP and indicators
3	Media display	Appropriate combination of symbols, colors and letters
4	Media efficiency	Ease of use of media

Source: Afriyose (2022)

Table 5. Assessment Instrument Grid for Learning Design Experts

No	Assessment Aspects	Indicators/Assessment Items
1	Design view	Front view
		Image display
2	Content design	Consistency
		Content illustration
3	Design accuracy	Design attractiveness
		Design readability
		Design systematics

Table 6. Response Instrument Grid for students

No	Assessment Aspects	Indicators/Assessment Items
1	Content Eligibility	Clarity of study guide
		Systematic arrangement of material
		Material suitability
		Tasks according to PBL
		Evaluation according to the material topic
2	Technical/appearance quality	The beauty of Linktree's main screen display
		Readability of text on the main screen
		Image Suitability
		Color composition
		Ease of displaying the contents of existing links on the Linktree main screen
3	Usefulness	Level of understanding of the material using Linktree
		Ease of learning using Linktree
		Interest in learning to use Linktree
		The attractiveness and ease of the Problem Based Learning (PBL) learning model

The instrument for student learning outcomes in this research is a multiple choice test which will be used to see the effectiveness of using Linktree media based on Problem Based Learning in learning History. These questions cover the cognitive domain of Bloom's Taxonomy which consists of: C1 (Knowledge), C2 (Understanding), C3 (Application), C4 (Analysis), C5 and C6 test results will be submitted to students to determine the percentage increase in student learning outcomes with using Linktree learning media.

Table 7. History Learning Results Test Grid for Students.

Learning objectives	Subject matter	Indicator
Analyzing the national movement in Indonesia	Indonesian National Movement	• Students are able to explain the background of the national movement in Indonesia • Students are able to identify the organizations of the Indonesian National Movement • Students are able to analyze the role of prominent figures in the Indonesian national movement • Students are able to analyze the impact of the national movement on Indonesia today

Before being used and considered suitable, this learning outcomes test instrument will go through a prerequisite testing stage or analysis of test items to determine the quality of the questions tested statistically, with the aim of validating the instrument so that the data results become valid. The prerequisite testing includes instrument validity testing, reliability testing, level of difficulty, and differentiability, the testing of which is assisted using SPSS 26.

Data analysis in Linktree's interactive learning media development research uses quantitative descriptive analysis, where data collected from questionnaires is analyzed using descriptive statistical techniques that are quantitatively grouped to clarify judgments and draw conclusions.

Table 8. Percentage Scale for Questionnaires

Percentage of Achievement	Value Scale	Interpretation
76% ≤ skor ≤ 100%	4	Very Eligible
51% ≤ skor ≤ 75%	3	Eligible
26% ≤ skor ≤ 50%	2	Fairly Decent
0% ≤ skor ≤ 25%	1	Not Eligible

Source: Sugiono (2020).

The total assessment score can be calculated using the following formula::

$$Eligibility\ percentage = \frac{Total\ score\ from\ data\ collection}{Total\ maximum\ ideal\ score} x\ 100\%$$

The percentage obtained from feasibility testing by experts is converted into a table form that can be read in the research results. The determination of the criteria is done by:

1) Determine the ideal score percentage (maximum score) of 100%.
2) Determine the lowest score percentage (minimum score) = 0%.
3) Determine the range: 100 minus 0 = 100.
4) Determine the desired interval of 4 (very feasible, feasible, quite feasible, and less feasible).
5) Determine the interbal width (100/4 = 25).

The N-Gain test was carried out to assess effectiveness, by comparing the pretest and posttest results from the experimental class and the control class. The data analysis in testing the effectiveness of the Linktree media, which was developed apart from using the Independent Samples Test, also used N-Gain with the help of the SPSS 26 application. The distribution of levels of achievement of the N-Gain value can be seen in Table 9.

Table 9. Categorization of N-Gain Score

Precentage (%)	Category
< 40	Ineffective
40 – 55	Less Effective
56 – 75	Moderately Effective
>76	Efektif

Based on Table 9 above, learning media is effective if student learning outcomes obtain an N-Gain percentage score > 56 in the moderately effective or effective category.

RESULTS AND DISCUSSION

Results

Validation in the subject matter aspect is carried out by lecturers who are experts in history learning material. The assessment for subject matter expert validation includes the suitability of the content/material, presentation, contextual assessment, and learning aspects using the problem-based learning model. The results obtained from material expert validation are in Table 10 below.

Table 10. Results of Expert Assessment of Learning Materials

No	Assessment Aspects	Indicator	Answer	%	Criteria
1	Content Feasibility Aspect	Suitability of material to Learning Outcomes (CP) and Learning Objectives (TP)	4	100	Very Eligible
		Material Accuracy	3	75	Eligible
		Material Update	3	75	Eligible
2	Aspects of Feasibility of Presentation	Accuracy in the order of presentation of material	4	100	Very Eligible
		Supporting Material Presentation	4	100	Very Eligible
3	Aspects of Contextual Assessment	Contextual Essence	4	100	Very Eligible
		Contextual Component	4	100	Very Eligible
4	Learning Aspects using the Problem Based Learning model	Student involvement and role in learning activities 4 100 Very Appropriate	4	100	Very Eligible
	Average		**30**	**93,75**	Very Eligible

Assessment aspects for media expert validation include instructions or guides, quality of media content, and media appearance and media efficiency. The results of this media validation can be seen in Table 11 below.

Table 11. Learning Media Expert Assessment Results

No	Assessment Aspects	Indicator	Answer	%	Criteria
1	Instructions/guide	Clarity of information and guidance on how to use Linktree media	4	100	Very Eligible
		Interesting component of instructions/study guide	3	75	Eligible
2	Quality of media content	Conformity of media content with CP. T.P. ATP and indicator	4	100	Very Eligible
3	Media display	Suitability of combination of symbols, colors and letters	4	100	Very Eligible
4	Media efficiency	Ease of use of media	4	100	Very Eligible
	Average		**19**	**95**	Very Eligible

Source: Afriyose (2022)

The assessment includes aspects of design appearance, content design, and design accuracy. The results of the learning design expert validation are shown in Table 12.

Table 12. Assessment Results for Learning Design Experts

No	Assessment Aspects	Indicator	Answer	%	Criteria
1	Design view	Front view	4	100	Very Eligible
		Image view	4	100	Very Eligible
2	Content design	Consistency	4	100	Very Eligible
		Illustrations content	4	100	Very Eligible
3	Design accuracy	Design attractiveness	4	100	Very Eligible
		Design readability	4	100	Very Eligible
		Design systematics	4	100	Very Eligible
	Average		**28**	**95**	Very Eligible

Table 13. Average Expert Validation Score Results for all aspects

No	Validator	%	Criteria
1	Learning Material Expert	93,75	Very Eligible
2	Learning Media Experts	95,00	Very Eligible
3	Learning Design Experts	100,00	Very Eligible
	Average	**96,25**	Very Eligible

This product practicality test was carried out by teachers in the field of history studies, the assessment aspect includes three things: aspects of content suitability, technical/appearance quality and aspects of usefulness of Linktree learning media products. The result data is shown in Table 14 below.

Table 14. Test Results for students

No	Assessment Aspect	Indicators/Assessment Items	Response	%	Criteria
1	Content Eligibility	Clarity of study guide	8	66.67	Layak
		Systematic material arrangement	10	83,33	Very Eligible
		Material suitability	11	91,67	Very Eligible
		Assignments in accordance with PBL	9	75,00	Very Eligible

		Evaluation according to material topic	10	83,33	Very Eligible
2	Technical/appearance quality	The beauty of the Linktree	12	100	Very Eligible
		Readability of text on the main screen	10	83,33	Very Eligible
		Suitability Figure	11	91,67	Very Eligible
		Color composition	10	83,33	Very Eligible
		Ease of displaying the contents of links on the main screen of Linktree	10	83,33	Very Eligible
3	Usefulness	Level of understanding of the material using Linktree	9	75,00	Very Eligible
		Ease of learning using Linktree	10	83,33	Very Eligible
		Interest in learning using Linktree	11	91,67	Very Eligible
		The attractiveness and ease of the Problem Based Learning (PBL) learning model	10	83,33	Very Eligible
	Average			83,92	Very Eligible

The assessment results from this small group trial can be seen in Table 15 below:

Table 15. Results of small group student trials

No	Assessment Aspect	%	Criteria
1	Eligibility Contents	91,00	Very Eligible
2	Technical quality/ appearance	88,50	Very Eligible
3	Benefits	90,00	Very Eligible
	Average	89,83	Very Eligible

The assessment results from this field trial can be seen in Table 16 below:

Table 16. Results of student field trials

No	Assessment Aspect	%	Criteria
1	Eligibility Contents	93,38	Very Eligible
2	Technical quality/ appearance	94,13	Very Eligible
3	Usefulness	94,69	Very Eligible
	Average	94,06	Very Eligible

Based on the results of the calculations with the help of SPSS 26, the sig value effectiveness test was obtained. (2-tailed) 0.00 is <0.05, indicating it is significant. Thus, the results of students' history learning using the Linktree interactive learning media based on the problem-based learning model are different from the learning outcomes of students using the Linktree interactive learning media with the Jigsaw Cooperative Learning model, so it is interpreted as effective use of the Linktree interactive learning media based on problem-based learning to improve results. student learning history. Clearly, the results of the effectiveness test with SPSS 26 can be seen in Table 17.

Table 17. Independent Samples Test Results

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
hasil_belajar	Equal variances assumed	.033	.856	4.856	78	.000	6.100	1.256	3.599	8.601
	Equal variances not assumed			4.856	77.677	.000	6.100	1.256	3.599	8.601

Based on the data in Table 17, the Sig (2-tailed) is 0.00, meaning that the result is <0.05 so it is significant, so Ho is rejected and Ha is accepted. Thus, student learning outcomes in history lessons in class XI at MAN 2 Medan Model can be improved effectively by using the problem-based interactive learning media Linktree.

The N-Gain test was also carried out to test effectiveness by comparing the pretest and posttest results from the experimental class and control class. Testing the effectiveness of this Linktree-based interactive learning media is assisted by the use of SPSS 26.

Descriptives

	kelas			Statistic	Std. Error
N_GAINPERSENTASE	Kelas Eksperimen	Mean		60.9678	2.94052
		95% Confidence Interval for Mean	Lower Bound	55.0200	
			Upper Bound	66.9156	
		5% Trimmed Mean		60.9364	
		Median		61.2500	
		Variance		345.866	
		Std. Deviation		18.59746	
		Minimum		20.00	
		Maximum		100.00	
		Range		80.00	
		Interquartile Range		20.24	
		Skewness		.112	.374
		Kurtosis		.294	.733
	Kelas Kontrol	Mean		-13.5652	6.89367
		95% Confidence Interval for Mean	Lower Bound	-27.5331	
			Upper Bound	.4027	
		5% Trimmed Mean		-8.5909	
		Median		.0000	
		Variance		1805.863	
		Std. Deviation		42.49545	
		Minimum		-150.00	
		Maximum		33.33	
		Range		183.33	
		Interquartile Range		20.00	
		Skewness		-2.240	.383
		Kurtosis		4.745	.750

Based on the results of the average N Gain score for the experimental class which applied Linktree interactive learning media with the Problem Based Learning model approach, it was 60.96 or 60.97%, including "quite effective" in the "medium" category. Furthermore, the calculation for the control class which uses Linktree interactive learning media with the cooperative learning jigsaw model approach is - 13.56 or - 13.56%, including "ineffective". Thus, it can be concluded that the Linktree interactive learning media based on Problem Based Learning is quite effective for use in history learning in class XI MA compared to using Linktree based interactive learning media with the Cooperative Learning jigsaw model.

Discussion

Based on the results of data analysis from validation experts, the results of individual tests consisting of 3 students, small groups consisting of 10 students, and field tests consisting of 40 students show: (1) the PBL-based Linktree interactive learning media developed is valid, feasible, and practical for use in the Man 2 Medan Model; (2) based on the T-test of the PBL-based Linktree interactive learning media, which was developed effectively in improving Man 2 Medan Model student learning outcomes; and (3) based on the N-Gain test of the PBL-based Linktree interactive learning media, which was quite effective in improving the learning outcomes of Man 2 Model Medan students.

The implementation of Linktree interactive learning media in class XI brings a new atmosphere and makes students interested and active in providing solutions to problem topics discussed in the history learning process. In line with research by Aeni et al. (2023), using the Linktree website for students and 112 making the Linktree application an alternative for learning is more enthusiastic and effective. It's important for teachers and students to be able to access Linktree easily, regardless of whether they are at school or not. In this context, the role of the teacher is to be a facilitator so that the history learning process runs smoothly. To be able to become a facilitator, it is necessary to increase the competency of teaching staff so that they have 21st-century learning skills.

It turns out that Linktree's PBL-based interactive learning media product has met the eligibility criteria both in terms of material, media, and learning design, with an overall score of 96.25% from expert validation. This is because the contents of the Linktree being developed pay attention to material that is worthy of collaboration with the PBL model. Apart from that, in terms of media content and design used, we also pay attention to characteristics that are easy for Madrasah Aliyah students to understand.

PBL-based Linktree interactive learning media, which was developed before obtaining eligibility, underwent a revision stage with the validator. The suggestions given by the validator are used as input and guidance to improve the PBL-based Linktree interactive learning media product, so it is concluded that the Linktree interactive learning media based on problem-based learning in the field of history is suitable to be tested on students and applied in class XI Man 2 learning the Terrain Model.

This is in line with research from Nur, Muhammad, et al. (2022), who conducted research to increase students' learning motivation and critical thinking skills through the development of contextually Linktree-assisted interactive E-LKPD XI MIPA 1 SMAN 3 Banjarmasin. The results of the research show that E-LKPD is interactive, valid, and feasible. Very valid (96.6%), Very practical (91.78%) in initial field trials, 88.75% in the main field trials, and the results of teacher reactions (91.78%) and teacher activities with 80, 55%. (3) Effective, with N-gain 0.40 (medium). Then research from Andika and Yudiana (2022), who conducted research with this product trial, was carried out by 17 students in class IV of the Bebalang 1 State elementary school. The results show that each component of the instrument used to verify the content of learning activities is correct. As well as research from Imani et al. (2021), who conducted research using Quizizz and Linktree media regarding material on the human circulatory system for class VIII/SMP to increase students' learning potential by obtaining research results of 92% in accordance with the media expert validation test results.

The practicality of Linktree interactive learning media products is demonstrated by users of Linktree learning media. This product is used by 115 history teachers and students in F XI MAN 2 Model Medan. This assessment covers three aspects, namely the suitability of the content, the technical/appearance quality, and the usefulness aspect of Linktree's interactive learning media products, with a score of 94.64%. PBL-based Linktree

Interactive learning media is said to be practical because the practicality test includes: (1) the implementation of Linktree, which shows that all learning elements are in the fully implemented category; (2) the teacher's reaction to the use of Linktree; and (3) the suitability of educators' activities to learning. PBL-based is at the limit of the tolerance interval.

The effectiveness of the PBL-based Linktree interactive learning media has apparently succeeded in improving students' history study and learning results as well as increasing students' critical thinking because there is a PBL syntax that encourages critical thinking in finding their own ideas in learning, this is in line with constructivism theory. To increase students' critical thinking abilities, they are obtained through learning experiences in group discussions. Through this group discussion, students can interact and exchange ideas to solve the problems discussed in the material topic of the Indonesian National Movement. Apart from that, by continuously using PBL-based Linktree interactive learning media, students will get used to evaluating and analyzing their personal thinking patterns and will be able to summarize the main points based on the scientific insights learned with the help and guidance of friends or teachers. This is in line with the results of research conducted by Afriyose et al. (2022) regarding Linktree, as follows: Data on the efficacy of using Lintree learning media based on discovery learning to enhance geography learning outcomes for four sizable groups was gathered for The Effectiveness of the Development of Lintree Learning-Based Lintree Learning Media to Improve Geography Learning Outcomes in Senior High Schools. By highlighting the successful application of linktree-based learning media based on discovery learning to enhance student learning outcomes, the four groups successfully provided the same information. From the explanation above, the point is to state that the effectiveness of using Linktree has improved student geography learning outcomes through Linktree-based learning media and the discovery learning model.

Furthermore, research by Andika and Yudiana (2022), who conducted research with 17 level IV students at SD Negeri 1 Bebalang, involved testing a product. The findings from the research showed that all aspects of the content validation instrument for the learning activities were proven to be valid. Students' scientific literacy and metacognitive abilities are considered good. The results of this research were concluded to have a positive effect on learning.

Referring to the results of research studies and pre-existing knowledge as well as the learning theories above, it appears that the PBL-based Linktree interactive learning media developed shows that learning activities using Linktree media have proven to be effective and can be recommended for use in learning contexts. Apart from that, the teacher's ability to act as a qualified facilitator in using technology in learning and as a motivator has an influence on students' learning outcomes.

CONCLUSION

The context of this research, regarding the Linktree product, which was developed as a PBL-based interactive learning medium to improve history learning outcomes, has met the criteria for validity and practicality and is suitable for use in the Medan Model F XI Man 2 class. The overall assessment percentage reached 93.02%. This concludes that the use of PBL-based Linktree interactive learning media is in the "very feasible" category.

The results of the development of this learning medium show that the scale meets the standards of effectiveness in improving student learning outcomes, with an average assessment score in the experimental class of 89.9% and in the control class of 83.80%. Meanwhile, based on the results of calculations using IBM SPSS 26, the effectiveness test

shows that the sig. (2-tailed) 0.000 is <0.05, indicating statistical significance. Furthermore, according to the N-Gain calculation for the experimental treatment class, which used Linktree interactive learning media with a PBL approach, it was 60.9678, or 60.97%, including "quite effective" in the "medium" category.

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