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## Fostering Interest and Critical Thinking in Mathematics Education: The Role of Integrated Evaluation Based on Linktree Platform

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### Abstract

Based on a survey conducted by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the interest in learning among students in Indonesia is still relatively low, ranking 64th out of 120 countries. In 2007, the Global Institute reported that only 5% of students could solve high-level problem-solving tasks. This study aims to assess student responses, learning interests, and mathematical problem-solving skills following the implementation of Linktree. Linktree is an e-learning platform that offers ease in managing information despite being HTML-based. Moreover, it integrates seamlessly with various media, offers multiple tools, and presents customizable interfaces. The research methodology was quantitative, with a sample of 30 eighth-grade students from Junior high school. Data were collected through five mathematical problem-solving essay questions and questionnaires assessing student responses and learning interests post-Linktree usage. Findings revealed positive student responses towards Linktree, particularly in number patterns, with an average percentage of 84%, indicating excellent feedback. Post-Linktree usage, students exhibited an average percentage of 78% across four indicators of learning interest, classified as good. The students improved their mathematical problem-solving skills, with an average N-gain score of 0.64 and an N-gain percentage of 64.37%, categorized as moderately effective. Linktree's contribution to students' learning interest and mathematical problem-solving skills was significant, as evidenced by the hypothesis testing results, with a determination of 0.776 or 77.6% for learning interest and 0.629 or 62.9% for problem-solving skills. In conclusion, Linktree significantly contributes to students' learning interests and mathematical problem-solving skills.

**Keywords:** *Educational Technology, Learning Interest, Linktree Implementation, Mathematical Problem-Solving Skills, Student Responses*

### A. Introduction

The issue of students' learning interests and mathematical problem-solving skills remains prevalent, as evidenced by numerous surveys and research studies conducted in the field (Verschaffel et al., 2020; Lester & Cai, 2016). Prominent international assessments such as the Programme for International Student Assessment (PISA) underscore a concerning trend: a recent decline in mathematical proficiency among Indonesian students (Wijaya et al., 2024). Furthermore, direct observations within classrooms consistently highlight passive learning behavior and significant challenges in grasping mathematical concepts, particularly those related to problem-solving strategies (Foley et al., 2019). Compounding these challenges are the traditional teaching methodologies, which emphasize rote memorization at the expense of fostering critical thinking and real-world application of mathematical principles. Consequently,

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combining these factors exacerbates the overarching issue, creating a pressing need for innovative approaches to address and rectify the shortcomings in mathematics education. Therefore, there is a need for an Integrated Evaluation Based on the Linktree Platform to comprehensively assess its potential impact on addressing these challenges and improving students' learning outcomes.

Numerous prior research endeavors have explored the intricate relationship between educational technology adoption and its impact on learning outcomes. Notably, a study conducted by Plaisant et al., (2002) Dedy Prayoga in 2021 meticulously investigated the implementation of online learning using Linktree. This research revealed a notable surge in students' learning interest, underscoring the efficacy of Linktree as an educational tool. Similarly, research efforts by Timotheou et al., (2023) and Huang & Zheng, (2009) shed light on the profound influence of information technology on students' learning enthusiasm and problem-solving abilities. Despite the wealth of evidence provided by these studies, the full potential of Linktree in revolutionizing mathematics education remains largely untapped (Manurung et al., 2023; Nera Afriyose et al., 2022). This is primarily attributed to a myriad of challenges encountered, notably the limited proficiency among educators in effectively integrating technology into their teaching practices. As such, there is a critical need for further exploration and understanding of how Linktree can be optimally harnessed to bolster mathematics education and maximize student learning outcomes.

The primary focus of this study lies in meticulously scrutinizing the integrated application of Linktree within the realm of mathematics education, with the overarching goal of augmenting students' learning interest and problem-solving proficiencies. At its core, the study endeavors to meticulously evaluate the efficacy of Linktree in bolstering students' engagement levels and fostering a more profound comprehension of mathematical concepts. Furthermore, it seeks to delve into the practical aspects of incorporating Linktree into classroom environments, aiming to cultivate an atmosphere conducive to active learning and critical thinking skills among students. By attaining these objectives, the study offers invaluable insights into Linktree's untapped potential as a versatile educational tool in mathematics instruction. By shedding light on the multifaceted benefits and practical applications of Linktree, the study aspires to inform educators, policymakers, and stakeholders alike about the transformative role this innovative platform can play in shaping the future of mathematics education. Through rigorous analysis and comprehensive evaluation, the study aims to unravel the intricacies surrounding the integration of Linktree, thereby paving the way for its seamless incorporation into educational practices and facilitating enhanced learning outcomes for students. Ultimately, the study endeavors to serve as a beacon of knowledge, illuminating the path towards more effective and engaging mathematics instruction through using Linktree.

This study holds significant importance as it addresses the critical imperative to enhance learning outcomes within mathematics education, especially concerning students' interest levels and problem-solving proficiencies. By harnessing the potential of Linktree as a cutting-edge educational technology, this study endeavors to present a viable solution to the challenges encountered in traditional teaching methodologies. Furthermore, the insights gleaned from this study have the potential to enlighten educational policymakers, school administrators, and teachers alike regarding the myriad benefits associated with the integration of Linktree into mathematics instruction. Ultimately, the findings of this study contribute substantially to the ongoing discourse surrounding the productive utilization of technology in education and its

consequential impact on student learning outcomes. Through rigorous analysis and comprehensive evaluation, this study aims to advocate for adopting innovative educational technologies like Linktree to drive positive transformations in mathematics education and foster enhanced student engagement and achievement.

## **B. Methods**

### ***Research Design***

This study adopts a quantitative research design to comprehensively evaluate student responses, learning interests, and mathematical problem-solving skills after integrating Linktree. Quantitative research, renowned for its systematic approach and reliance on numerical data, offers a robust framework for analyzing the impact of educational interventions (Hartas, 2010). By employing this methodological approach, the study seeks to gather empirical evidence regarding the effectiveness of Linktree in mathematics education. Through the systematic collection of numerical data, including metrics related to student responses and performance, the study endeavors to generate objective and quantifiable insights. By leveraging statistical analysis techniques such as correlation and regression, the study aims to uncover patterns and trends in the data, providing valuable insights into the efficacy of Linktree for student learning outcomes. This approach complements the quantitative research methodology, which enables precise measurement and analysis of variables, facilitating a nuanced understanding of the relationship between the implementation of Linktree and its impact on student learning.

### ***Research Procedure***

The research procedure comprises a series of systematic steps to investigate the impact of Linktree on student learning outcomes. It commences with identifying the sample, which includes 30 eighth-grade students selected from SMP 1 Rajagaluh Indonesia to participate in the study. These students serve as representatives for assessing the effectiveness of Linktree in enhancing learning experiences. Following the selection process, the Linktree platform is introduced to the chosen students as a supplementary tool to facilitate their learning activities. Through this introduction, students gain access to various resources and tools embedded within the Linktree platform, aiding in their comprehension of mathematical concepts. Once the introduction phase is completed, the research moves to the crucial data collection stage. This phase involves administering five mathematical problem-solving essay questions and questionnaires to the participating students. These instruments are meticulously designed to gauge student responses and learning interests post-Linktree usage. By collecting comprehensive data through these instruments, the research aims to capture a holistic understanding of the impact of Linktree on various aspects of student learning.

Following data collection, the study proceeds to the analysis phase, where the collected data are subjected to rigorous examination and evaluation. Through statistical techniques and quantitative analysis methods, the researchers aim to identify data patterns, trends, and correlations. Specifically, the analysis assesses how much Linktree influences students' learning interests and mathematical problem-solving skills. Ultimately, the research endeavors to provide valuable insights into the efficacy of Linktree as an educational tool. By following this systematic research procedure, the study aims to contribute to the existing knowledge regarding technology integration in education. Through a comprehensive examination of the research

findings, educators and policymakers can make informed decisions about adopting and implementing Linktree to enhance student learning outcomes in mathematics.

### ***Data Collection Techniques***

Two primary instruments are utilized for data collection as part of the research methodology. Firstly, mathematical problem-solving essay questions are crafted to assess students' problem-solving abilities. These essay questions, totaling five in number, delve into various mathematical concepts and scenarios, allowing students to demonstrate their problem-solving skills. These questions, administered to the participating students, aim to gauge their proficiency in tackling mathematical challenges and identifying effective problem-solving strategies. In addition to the essay questions, questionnaires are employed to gather valuable insights into students' responses and learning interests following their utilization of Linktree. These questionnaires are thoughtfully designed to capture students' perceptions, preferences, and experiences with Linktree as an educational tool. By soliciting feedback through the questionnaires, the research aims to ascertain the effectiveness of Linktree in engaging students and fostering their learning interests in mathematics. Through the combined use of mathematical problem-solving essay questions and questionnaires, the research endeavors to comprehensively evaluate the impact of Linktree on students' problem-solving abilities and learning experiences.

### ***Data Analysis Techniques***

The process of analyzing the collected data comprises two primary methodologies. Initially, descriptive analysis is undertaken using descriptive statistics to scrutinize the data derived from the mathematical problem-solving essay questions and questionnaires. This phase entails computing means, percentages, and standard deviations, offering a comprehensive overview of the data's distribution and central tendencies (Mertler et al., 2021). After this, inferential analysis is executed utilizing inferential statistics, notably hypothesis testing. This step involves evaluating the significance of the findings and delineating the influence of Linktree on students' learning interests and problem-solving proficiencies. Using hypothesis testing, the study endeavors to determine the effect size stemming from Linktree implementation, thereby furnishing deeper insights into its efficacy as an educational instrument. Through this dual-pronged analytical approach, the research aims to provide a nuanced understanding of the impact of Linktree on student learning outcomes in mathematics education.

## **C. Findings and Discussion**

### ***Exploring Student Feedback on Linktree***

Student response data was acquired through a Likert scale questionnaire. The questionnaire contained statement indicators that had been adjusted to the research problem to reveal students' feedback after using Linktree. Researchers utilized a Likert scale questionnaire as a rating scale as the data collection instrument. The questionnaire consisted of 16 questions covering 2 indicators: ease of use of Linktree and attractiveness of Linktree. This questionnaire has been validated by validators and distributed to 30 eighth-grade students.

The results of the research questionnaire on 30 student responses during the use of Linktree provided at the end of the meeting showed that the student response after using Linktree was very good, with an average percentage of 85%. Of the 2 indicators of questionnaire questions

related to student responses, there is an indicator of ease of use of Linktree, which obtained an average percentage of 86%, and the attractiveness indicator of Linktree, which obtained an average percentage of 84%. From the above results, it can be seen that students' responses to using Linktree are very good. This is because Linktree's presentation is equipped with e-modules, videos, and examples. This opinion is reinforced by research conducted by Iftinan & Huda (2023), which states that Linktree can help students understand the material quickly and make learning activities interesting so that they become active and creative. This aligns with research by Yonwilad et al. (2022), which explains that an alternative solution to improve students' mathematical problem-solving skills is to involve students in learning activities. Teachers must change the way they teach and learn to provide motivation (Appova & Arbaugh, 2018). This indicates that Linktree, seen from the indicators of ease and attractiveness in learning interest and problem-solving skills after using Linktree, provides a positive response.

### ***Student Learning Interest Using Linktree***

Data was gathered through a questionnaire sheet to acquire student responses. The questionnaire sheet contains statement indicators tailored to the research problem to reveal students' learning interest responses after using Linktree. Researchers utilized a Likert scale in the form of a rating scale as the data collection instrument. The questionnaire consists of 20 questions covering 4 indicators: enjoyment, interest, engagement, and attention of students towards Linktree. Validators have validated this questionnaire and distributed it to 30 eighth-grade students.

The students' learning interest after using Linktree is good, with a percentage score of 78% in the indicator of enjoyment, which falls into the good category. Furthermore, the engagement indicator scored 80%, which is categorized as very good. The interest indicator scored 76%, considered good, and the last indicator, students' attention, scored 78%, also falling into the good category. Thus, the overall percentage of students after using Linktree is 78%, indicating a positive response. The positive responses from students towards the integration of Linktree into their learning experience highlight its potential as a valuable educational tool. With students reporting feelings of enjoyment, active engagement, and maintained attention while using Linktree, it suggests that the platform effectively supports their learning process. Despite slightly lower scores in the interest indicator, the overall positive feedback indicates that Linktree contributes positively to student learning environments. This underscores the importance of incorporating user-friendly digital tools like Linktree into teaching practices to enhance student engagement and optimize learning outcomes (Nur et al., 2022; Ninawati & Wahyuni, 2020). Further research could delve into specific factors influencing student responses to digital platforms like Linktree, offering insights for educators seeking to leverage technology in their teaching strategies.

### ***Students' Mathematical Problem Solving Skills***

The results of the research on students' mathematical problem-solving skills after using Linktree with Polya's stages and data from pre-tests and post-tests of 5 essay questions were obtained. Subsequently, the data were processed using the N-gain test to find the N-gain score. The student's responses to each question using Polya's stages are as follows:

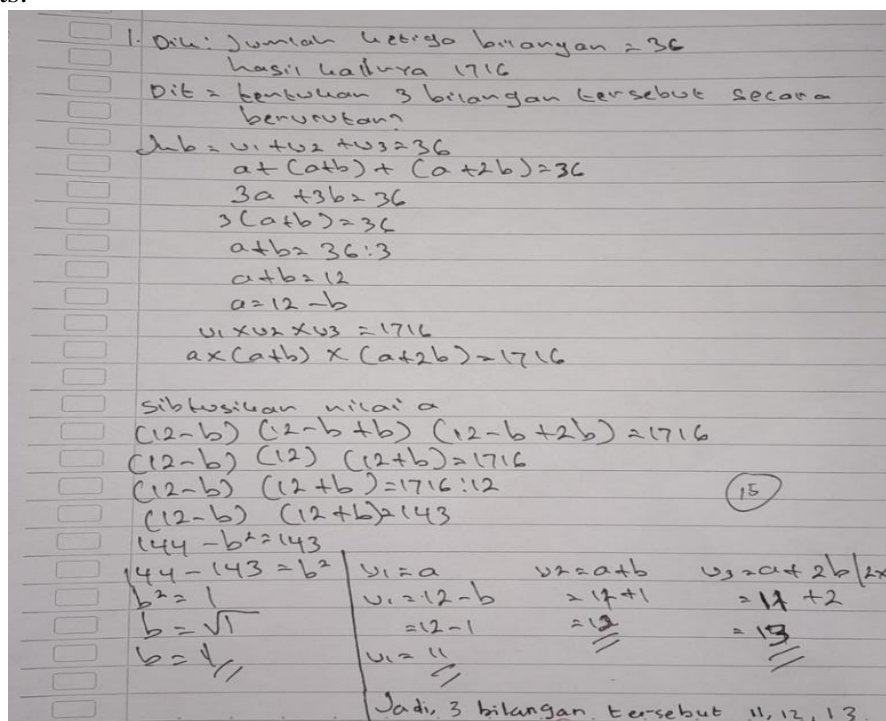
**Soal No 1**

Tiga buah bilangan berurutan membentuk barisan aritmatika. Jumlah ketiga bilangan tersebut adalah 36 dan hasil kalinya adalah 1716. Tentukan tiga bilangan tersebut secara berurutan?

**Question No 1:**

Three consecutive numbers form an arithmetic sequence. The sum of these three numbers is 36, and their product is 1716. Determine the three consecutive numbers?

Here is the answer to the mathematical problem-solving test question number 1 by the students:



**Figure 1.** Answer to Question No-1

Based on the illustration, the student can utilize the four stages of mathematical problem-solving skills with Polya's stages. In the understanding of the problem stage, the student can articulate the given information, which is that the sum of three numbers is 36 and the product of the three numbers is 1716, as well as identify the question posed by the problem, which is to determine the three consecutive numbers. In the planning stage, the student can strategize by assuming that the three unknown numbers are  $U_1$ ,  $U_2$ , and  $U_3$ , as presented in the known information:  $U_1 + U_2 + U_3 = 36$  and  $U_1 \times U_2 \times U_3 = 1716$ . Moving to the writing the solution steps stage, the student can outline the steps accurately, such as formulating equations for the sum of the three numbers  $U_1 + U_2 + U_3 = 36$  by assuming  $U_1 = a$ ,  $U_2 = a + b$ , and  $U_3 = a + 2b$ , then substituting into  $a + (a + b) + (a + 2b) = 36$  and  $a \times (a + b) \times (a + 2b) = 1716$ , resulting in  $U_1 = 11$ ,  $U_2 = 12$ , and  $U_3 = 13$ . Finally, in the checking the answer stage, the student can review and reinterpret the solution obtained and conclude that the three consecutive numbers are 11, 12, and 13.

**Soal No 2**

Pada peringatan ulang tahun kemerdekaan Indonesia yang ke-77 Toko Sepatu Nike memberikan diskon 90 % kepada 77 orang pembeli pertama. Pada pukul 09.00 sudah ada 7 pembeli. Pukul 09.05 bertambah menjadi 14 orang. Pukul 09.10 bertambah lagi menjadi 21 pembeli. Jika pola seperti ini berlanjut terus menerus, Tentukan pada pukul berapa 77 pembeli akan memamuski toko?

**Question No 2**

*On the 77th anniversary of Indonesian Independence Day, the Nike Shoe Store offers a 90% discount to the first 77 customers. At 09:00, there are already 7 customers. By 09:05, it increases to 14 people. At 09:10, it increases again to 21 customers. If this pattern continues continuously, determine at what time the 77 customers will completely fill the store?*

Here is the answer to the mathematical problem-solving test question number 2 by the students:

**2. Memecahkan Masalah**

Diketahui :

- Pukul 09.00 ada 7 pembeli.
- Pukul 09.05 ada 14 pembeli.
- Pukul 09.10 ada 21 pembeli.

**Merencanakan Masalah**

Jika diurutkan akan membentuk pola seperti dibawah ini :

7, 14, 21.

Jika diperhatikan kembali urutan pola tersebut merupakan selisih antar bilangan berurutan yaitu selisihnya sama 7. Untuk mempermudah maka dengan menggunakan bantuan tabel :

Pukul	09.00	09.05	09.10
Jumlah pembeli	7	14	21
Penambahan	7	7	7

**Menuliskan Langkah Penyelesaian**

Pukul	09.00	09.05	09.10	09.15	09.20	09.25	09.30	09.35	09.40	09.45
Jumlah pembeli	7	14	21	28	35	42	49	56	63	70
Penambahan	7	7	7	7	7	7	7	7	7	7

09.50  
77  
7

**Memeriksa Kembali Jawaban**

Jadi, 77 pembeli akan memasuki toko pada pukul 09.50

**Figure 2** Answer to Question No-2

Based on Figure, the student can use the four stages of mathematical problem-solving skills with Polya's stages. In the understanding the problem stage, the student can demonstrate what is known, namely by noting that at 09:00 there are 7 customers, at 09:10 there are 14 customers, and at 09:15 there are 21 customers, and then identifying the question asked in the problem, which is to determine at what time 77 customers will enter the store. In the planning stage, the student can plan the problem by arranging these numbers into a pattern, namely  $U_1 = 7$ ,  $U_2 = 14$ , and  $U_3 = 21$ . Upon further observation, the sequence of this pattern represents the constant



difference between consecutive numbers, which is 7. Next, in writing the solution steps stage, the student can solve the steps with the help of a table from the number of customers 7 to 77, so it can be determined that at 09:50, 77 customers will enter the store. Then, in the checking the answer stage, the student can review and reinterpret the solution obtained and draw the correct conclusion that 77 customers will enter the store at 09:50.

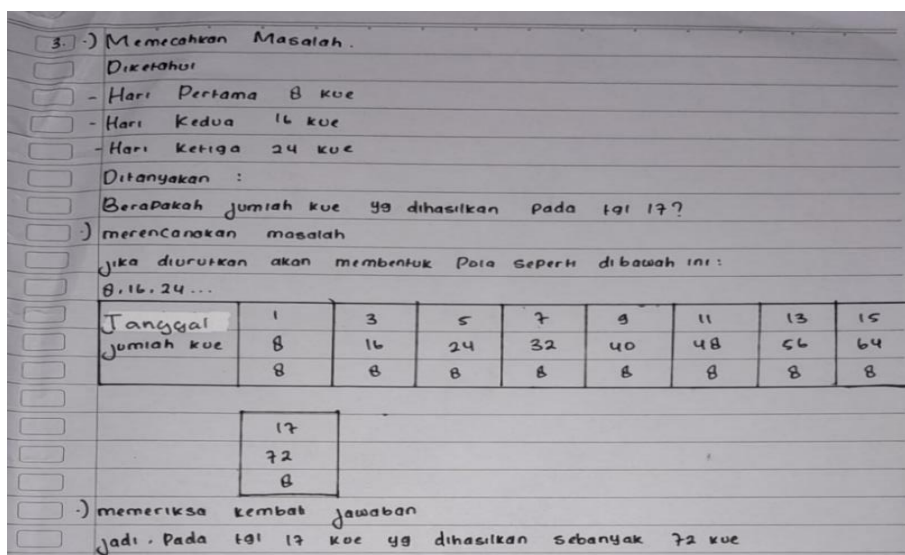
**Soal No 3**

Ibu Zahra adalah seorang pedangang kue, ia menerima pesanan kue di setiap tanggal ganjil. Di hari pertama tepatnya tanggal 1 ibu Zahra hanya membuat 8 buah kue. Hari kedua, ia membuat 16 kue. Hari selanjutnya sebanyak 24 buah kue. Jika pemesanan kue selesai pada tanggal 17, berpakah jumlah kue yang dihasilkan pada hari itu?

**Question No 3**

Mrs. Zahra is a cake merchant who receives cake orders on odd dates. On the first day, on date 1, Mrs. Zahra only makes 8 cakes. On the second day, she makes 16 cakes. The following day, she makes 24 cakes. If the cake orders are completed on the 17th date, how many cakes are produced on that day?

Here is the answer to the mathematical problem-solving test question number 3 by the students:



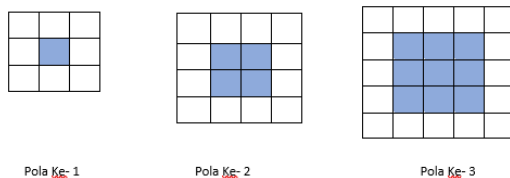
**Figure 3** Answer to Question No-3

Based on the Figure, the student is capable of using the four stages of mathematical problem-solving skills with Polya's stages. In the understanding the problem stage, the student can indicate what is known by noting the cake orders on every odd date, such as on date 1 there are 8 cakes. On date 3, there are 16 cakes, and on date 8, there are 24 cakes. The question asked in the problem is the total number of cakes produced on the 17th date. In the planning stage, the student can plan the problem by forming a pattern, such as  $U_1 = 8$ ,  $U_2 = 16$ , and  $U_3 = 24$  with each date increasing to 8 cakes. Next, in writing the solution steps stage, the student can complete the steps correctly because Mrs. Zahra always makes cakes on odd dates, so from the known pattern, which is 1, 3, 5, 7, 9, 11, 13, 15, 17 using a table, on the 17th date there are 72 cake orders. Then, in the checking the answer stage, the student can review and reinterpret the solution obtained and conclude that the cake orders were completed on the 17th date with 72 cakes.



**Soal No 4**

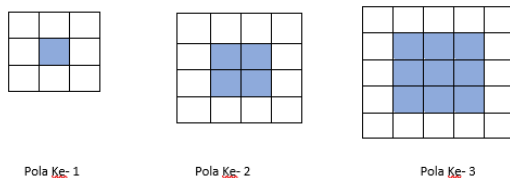
Pak Syakir membuat beberapa desain kolam berbentuk persegi. Tiap-tiap kolam mempunyai bentuk persegi pada area penampung air dan diberi ubin warna biru. Di sekitar kolam dikelilingi oleh pembatas yang dipasang ubin warna putih. Gambar berikut menunjukkan desain tiga kolam terkecil.



Berapa banyak ubin warna biru pada pola ke-100?

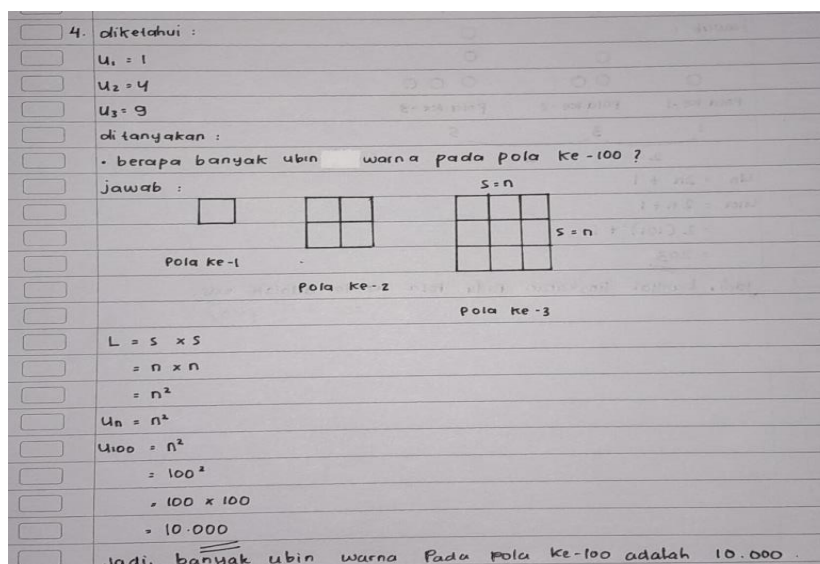
*Question No 4*

*Mr. Syakir designs several square-shaped ponds. Each pond has a square shape for the water containment area and is adorned with blue tiles. Surrounding the ponds are boundaries bordered with white tiles. The following image depicts the design of the three most miniature ponds.*



*How many blue tiles are there in the 100th pattern?*

Here is the answer to the mathematical problem-solving test question number 4 by the students:



**Figure 4** Answer to Question No-4

Based on the Figure 4, the student is capable of using the four stages of mathematical problem-solving skills with Polya's stages. In understanding the problem stage, the student can

indicate what is known by noting the number of blue tiles in the 1st pattern, which is 1 blue tile. In the 2nd pattern, there are 4 blue tiles; in the 3rd pattern, there are 9 blue tiles. The question asked in the problem is how many blue tiles are in the 100th pattern. In the planning stage, the student can plan the problem by observing a pattern that can be solved with a square (repeated multiplication) formula:  $U_1 = n^2 = 1^2 = 1$ ,  $U_2 = 2^2 = 4$ , and  $U_3 = 3^2 = 9$ . Next, in writing the solution steps stage, the student can complete the steps correctly, with  $U_{100} = 100^2 = 10.000$ . Then, in the checking the answer stage, the student can review and reinterpret the solution obtained and conclude that the number of blue tiles in the 100th pattern is 10,000.

**Soal Nomor 5**

Di hari minggu Dani dan Ibu Novi membeli bola berwarna kuning dari toko mainan. Kemudian sesampainya dirumah ia menyusun bola sedemikian sehingga membentuk pola seperti gambar di bawah ini.



Tentukan banyak lingkaran pada pola ke-101 pada konfigurasi objek berikut ini?

**Question No 5**

Dani and Mrs. Novi bought yellow balls from a toy store on Sunday. Then, upon arriving home, they arranged the balls in such a way as to form a pattern like the picture below.



Determine the number of circles in the 101st pattern in the following object configuration?

The following is the student's math problem solving skills test answer when solving problem number 5:

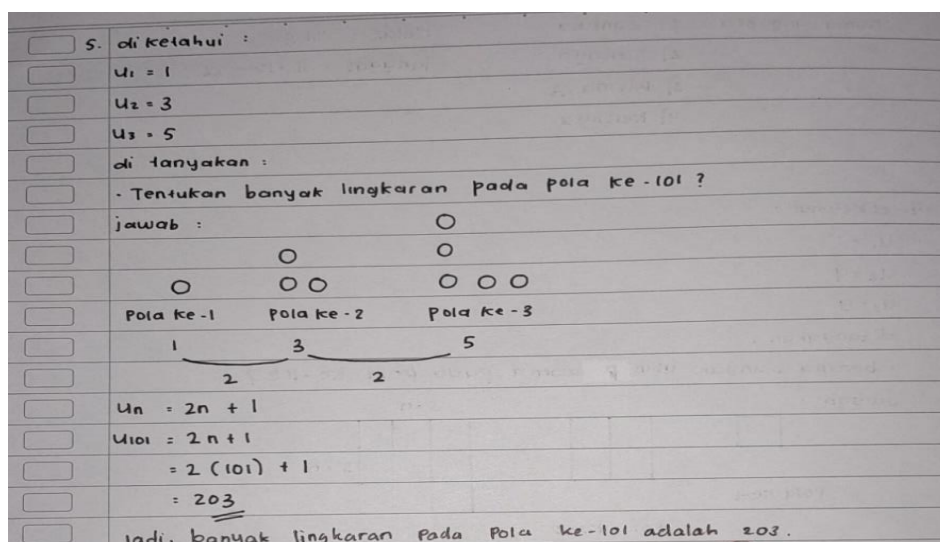


Figure 5 Answer to Question No-5

Based on the Figure, the student can use the four stages of mathematical problem-solving skills with Polya's stages. In understanding the problem stage, the student can indicate what is known by noting the yellow balls in the 1st pattern, which is 1 ball. In the 2nd pattern, there are 3 balls, and in the 3rd pattern, there are 5 balls. The question asked in the problem is how many yellow balls are there in the 101st pattern. In the planning stage, the student can plan the problem by observing a pattern that can be solved using an arithmetic sequence because there is a constant difference between terms, which is 2. Thus, the nth pattern can be represented by  $U_n = 2n + 1$ , so  $U_1 = 1$ ,  $U_2 = 3$ , and  $U_3 = 5$ . Next, in writing the solution steps stage, the student can complete the steps correctly, with  $U_{101} = 2(101) + 1 = (202) + 1 = 202 + 1 = 203$ . Then, in the checking the answer stage, the student can review and reinterpret the solution obtained and conclude that the number of yellow balls in the 101st pattern is 203.

Based on the statistical output of SPSS 25.0, 4 or 13.3% of students achieved N-gain scores between 40% to 55%, indicating less effective outcomes. Furthermore, 22 or 73.3% of students achieved N-gain scores between 56% to 75%, indicating somewhat effective outcomes. Additionally, 4 or 13.3% of students achieved N-gain scores greater than 75%, indicating effective outcomes. The students' mathematical problem-solving skills, with 30 respondents, show an average N-gain score of 0.64 and an average N-gain percentage of 64.37%. This falls within the category of reasonably effective. Therefore, using Linktree to enhance students' mathematical problem-solving skills in number pattern materials is reasonably effective. Researchers used the Shapiro-Wilk test on the SPSS 25.0 program to test the normality of the three variables.

**Table 1** Test of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
<i>Linktree</i>	0.163	30	0.040	0.950	30	0.168
Learning_Interest	0.134	30	0.182	0.954	30	0.216
<i>Problem_Solving</i>	0.127	30	0.200*	0.968	30	0.484

Based on the table, it is evident that all three datasets have a normal distribution because the Sig. Values for all three variables are  $\geq 0.05$ . This study conducted the homogeneity testing using the Levene statistical test assisted by SPSS 25.0. The results of the homogeneity test in this study can be seen in the table below:

**Table 2** Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Learning_Interest	Based on Mean	0.462	8	20	0.869
	Based on Median	0.388	8	20	0.914
	Based on Median and with adjusted df	0.388	8	14.38	0.910
	Based on trimmed mean	0.459	8	20	0.870
Problem_Solving	Based on Mean	1.351	8	20	0.276
	Based on Median	0.640	8	20	0.736

	Based on Median and with adjusted df	0.640	8	12.126	0.732
	Based on trimmed mean	1.291	8	20	0.303

From the table, it is evident that the Sig. Values for those variables are 0.869 and 0.276. According to interpretation, if the Sig. If the value is  $\geq 0.05$ , then the data is considered homogeneous. This test employed the Test for Linearity at a significance level of 0.05 with the assistance of SPSS 25.0. The results of the linearity test are as follows:

**Table 3** Anova

			Sum of Squares	df	Mean Square	F	Sig
Learning_Interest * Linktree	Between Groups	(Combined)	284,917	9	31,657	14,639	,000
		Linearity	254,694	1	254,694	117,778	,000
		Deviation from Linearity	30,223	8	3,778	1,747	,149
	Within Groups		43,250	20	2,162		
	Total		328,167	29			
Problem_Solving * Linktree	Between Groups	(Combined)	223,783	9	24,865	4,457	,003
		Linearity	210,995	1	210,995	37,818	,000
		Deviation from Linearity	12,788	8	1,598	,287	,963
	Within Groups		111,583	20	5,579		
	Total		335,367	29			

The Sig. value for the linktree's effect on learning interest is 0.000, and for the linktree's effect on mathematical problem-solving skills, the Sig. Value is 0.003. Based on interpretation, if the Sig. Value is  $< 0.05$ , then the data follows a linear pattern. This test utilized Pearson Correlation assisted by SPSS 25.0. The correlation test results are as follows:

**Table 4** Correlations

		Linktree	Problem_Solving	Learning_Interest
Linktree	Pearson Correlation	1	.793**	.881**
	Sig. (2-tailed)		.000	.000
	N	30	30	30
Problem_Solving_Matematis	Pearson Correlation	.793**	1	.899**
	Sig. (2-tailed)	.000		.000
	N	30	30	30
Learning_Interest	Pearson Correlation	.881**	.899**	1
	Sig. (2-tailed)	.000	.000	
	N	30	30	30

The table shows that the correlation test results between variables X and Y are  $0.000 < 0.05$ . The correlation test results indicate the relationship between link tree-based integrated evaluations and students' learning interests and mathematical problem-solving skills. This test was conducted using a determinant test assisted by SPSS 25.0. The results can be seen in the table below:

**Table 5 Model Summary**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.881 <sup>a</sup>	.776	.768	1.248

From the table, the contribution of linktree to learning interest, as indicated in the R Square column, is 0.776 or 77.6%. Based on the interpretation provided in the table, the value of 0.776 falls within the "good" category as it falls within the  $0.49 \leq R^2 \leq 0.81$ . Meanwhile, to determine the extent of linktree's contribution to students' mathematical problem-solving skills, it can be seen in the table below:

**Table 6 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.793 <sup>a</sup>	.629	.616	1.606

From the table, the contribution of Linktree to students' mathematical problem-solving skills, as indicated in the R Square column, is 0.629 or 62.9%. Based on the interpretation provided in the table, the value of 0.629 falls within the "good" category as it falls within the range of  $0.49 \leq R^2 \leq 0.81$ .

Based on the description of the research results outlined previously, it is found that the data for all three variables have a normal distribution, with Sig. Values for variable X (linktree usage) are 0.168, for variable Y (learning interest), are 0.216, and for variable Y (students' mathematical problem-solving skills) are. The Sig. values for all three variables are  $\geq 0.05$ . Therefore, the null hypothesis (H0) is accepted, and the alternative hypothesis (Ha) is rejected. Subsequently, a test for homogeneity of variances was conducted to confirm if the data for all three variables have equal variances. Sig supported this. Values of 0.869 and 0.276 for the respective variables. According to interpretation, if the Sig. If the value is  $\geq 0.05$ , then the data is considered homogeneous.

Through hypothesis testing, specifically the linearity test, it was found that the results of the linktree data concerning learning interest showed a value of 0.000, and regarding mathematical problem-solving skills, the Sig. The value was 0.003. Based on interpretation, if the Sig. Value is  $< 0.05$ , then the data follows a linear pattern. This means that the data from the linearity test of linktree-integrated evaluations on students' learning interests and mathematical problem-solving skills are considered linear. A correlation test was conducted, showing that the correlation test results between variables X and Y were  $0.000 < 0.05$ . Subsequently, a determinant test was performed, revealing that the contribution of linktree to learning interest was 0.776 or 77.6%, falling into the "good" category as it falls within the  $0.49 \leq R^2 \leq 0.81$ . Meanwhile, to ascertain the extent of linktree's contribution to students' mathematical problem-solving skills, it was found to be 0.629 or 62.9%, indicating that 0.629 falls into the "good" category as it falls within the  $0.49 \leq R^2 \leq 0.81$ . Therefore, it can be concluded that linktree contributes well to both learning interest and problem-solving skills.

## D. Conclusion

The research findings indicate that Linktree has significantly influenced students' learning interests and mathematical problem-solving skills in Indonesia. Utilizing a quantitative approach, the study assessed student responses, learning interests, and problem-solving abilities post-implementation of Linktree, an HTML-based e-learning platform known for its user-friendly interface and versatility in media integration. Encouragingly, students exhibited positive feedback towards Linktree, particularly in number pattern tasks, demonstrating an average percentage of 84% and indicating a high level of engagement. Moreover, the platform's impact on learning interest was substantial, with students showing an average improvement of 78% across various indicators, suggesting enhanced motivation and curiosity towards learning. Additionally, Linktree played a pivotal role in enhancing students' mathematical problem-solving skills, as evidenced by the average N-gain score of 0.64 and an N-gain percentage of 64.37%, reflecting moderate effectiveness. These findings underscore Linktree's potential as a valuable educational tool to bolster students' learning experiences and academic performance in Indonesia.

As a recommendation, educators and policymakers are encouraged to consider integrating Linktree into the curriculum to capitalize on its benefits and improve educational outcomes nationwide. The platform's user-friendly interface, seamless media integration, and effectiveness in enhancing learning interests and problem-solving skills make it a promising addition to the educational landscape. Furthermore, future research endeavors could delve deeper into the long-term effects of Linktree implementation and its scalability across diverse educational settings. By harnessing innovative e-learning platforms like Linktree, Indonesia can foster a more dynamic and engaging learning environment, equipping students with the necessary skills and knowledge to thrive in an increasingly competitive global landscape.

## References

- Appova, A., & Arbaugh, F. (2018). Teachers' motivation to learn: Implications for supporting professional growth. *Professional Development in Education*, 44(1), 5–21. <https://doi.org/10.1080/19415257.2017.1280524>
- Foley, C., McNeill, J., & Suter, S. (2019). *Leading Primary Mathematics*. SAGE Publications Ltd. <https://doi.org/10.4135/9781526483775>
- Hartas, D. (Ed.). (2010). *Educational Research and Inquiry: Qualitative and Quantitative Approaches*. Bloomsbury Academic. <https://doi.org/10.5040/9781474243834>
- Huang, R., & Zheng, L. (2009). An Empirical Study on Blended Learning in the Introduction to Educational Technology Course. In F. L. Wang, J. Fong, L. Zhang, & V. S. K. Lee (Eds.), *Hybrid Learning and Education* (Vol. 5685, pp. 122–132). Springer Berlin Heidelberg. [https://doi.org/10.1007/978-3-642-03697-2\\_12](https://doi.org/10.1007/978-3-642-03697-2_12)
- Iftinan, Q. T., & Huda, M. (2023). Collaborative-Social Media as Utilization of Advertising Text Learning Media. In M. H. Hikmat, Y. Sidiq, N. Ishartono, Y. Sulistyono, Patmisari, & Susiati (Eds.), *Proceedings of the International Conference on Learning and Advanced Education (ICOLAE 2022)* (Vol. 757, pp. 1755–1770). Atlantis Press SARL. [https://doi.org/10.2991/978-2-38476-086-2\\_141](https://doi.org/10.2991/978-2-38476-086-2_141)
- Lester, F. K., & Cai, J. (2016). Can Mathematical Problem Solving Be Taught? Preliminary Answers from 30 Years of Research. In P. Felmer, E. Pehkonen, & J. Kilpatrick (Eds.), *Posing and Solving Mathematical Problems* (pp. 117–135). Springer International Publishing. [https://doi.org/10.1007/978-3-319-28023-3\\_8](https://doi.org/10.1007/978-3-319-28023-3_8)
- Manurung, E. T., Sakur, S., & Hutapea, N. M. (2023). Pengembangan Media Pembelajaran Berbasis Linktree pada Materi Trigonometri untuk Memfasilitasi Kemampuan Pemahaman Matematis

- Siswa Kelas XI SMA/MA. *Juring (Journal for Research in Mathematics Learning)*, 6(2), 215. <https://doi.org/10.24014/juring.v6i2.18435>
- Mertler, C. A., Vannatta, R. A., & LaVenia, K. N. (2021). *Advanced and Multivariate Statistical Methods: Practical Application and Interpretation* (7th ed.). Routledge. <https://doi.org/10.4324/9781003047223>
- Nera Afriyose, Sudjarwo, & Sugeng Widodo. (2022). Development of Discovery Learning based Linktree Learning Media to Improve Geography Learning Outcomes in High School. *East Asian Journal of Multidisciplinary Research*, 1(8), 1625–1634. <https://doi.org/10.55927/eajmr.v1i8.1253>
- Ninawati, M., & Wahyuni, N. (2020). Efektivitas Bahan Ajar Berbasis Kearifan Lokal Terhadap Kemampuan Literasi Menulis Siswa Sekolah Dasar. *Jurnal Pemikiran Dan Pengembangan Sekolah Dasar (JP2SD)*, 8(1). <https://doi.org/10.22219/jp2sd.v8i1.12056>
- Nur, M., Winarti, A., & Iriani, R. (2022). Pengembangan E-LKPD Interaktif Berbantuan Linktree Pada Materi Koloid Dengan Model Contextual Teaching and Learning untuk Meningkatkan Motivasi Belajar dan Kemampuan Berpikir Kritis Peserta Didik. *JCAE (Journal of Chemistry And Education)*, 6(1), 1–12. <https://doi.org/10.20527/jcae.v6i1.1418>
- Plaisant, C., Grosjean, J., & Bederson, B. B. (2002). SpaceTree: Supporting exploration in large node link tree, design evolution and empirical evaluation. *IEEE Symposium on Information Visualization, 2002. INFOVIS 2002.*, 57–64. <https://doi.org/10.1109/INFVIS.2002.1173148>
- Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*, 28(6), 6695–6726. <https://doi.org/10.1007/s10639-022-11431-8>
- Verschaffel, L., Schukajlow, S., Star, J., & Van Dooren, W. (2020). Word problems in mathematics education: A survey. *ZDM*, 52(1), 1–16. <https://doi.org/10.1007/s11858-020-01130-4>
- Wijaya, T. T., Hidayat, W., Hermita, N., Alim, J. A., & Talib, C. A. (2024). Exploring contributing factors to PISA 2022 mathematics achievement: Insights from Indonesian teachers. *Infinity Journal*, 13(1), 139–156. <https://doi.org/10.22460/infinity.v13i1.p139-156>
- Yonwilad, W., Nuangchalerm, P., Ruangtip, P., & Sangsrikaew, P. (2022). Improving Mathematical Problem-Solving Abilities by Virtual 5E Instructional Organization. *Journal of Educational Issues*, 8(2), 202. <https://doi.org/10.5296/jei.v8i2.20099>