

## **Improving Creative Thinking Skill with Linear Equation Worksheet Based on Tri-N Activity**

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### **Abstract:**

Tri-N or *Niteni, Nirokake, Nambahi* (observing, imitating, adding) is a learning approach initiated by the Father of Indonesian Education, Ki Hadjar Dewantara. Tri-N is an adaptable approach that is easy to apply in every learning material, including mathematics. This research and development aims to develop an e-worksheet based on Tri-N for system of linear equations in two variables to improve junior high school students' creative thinking skills using the Liveworksheet Platform. The study employed the ADDIE development model, with stages: analysis, design, development, implementation, and evaluation although it was limited to the development stage to focus on validity and practicality. The results of this research include: (1) an e-worksheet based on Tri-N in a two-variable linear equation system has been produced to improve the creative thinking skills of junior high school students, (2) the validity test of the e-worksheet developed shows that 98.60% is categorized as very valid, and (3) the practicality test of the e-worksheet shows that 67.14% of students strongly agree and 31.90% of students agree on each aspect of the assessment. So, it can be concluded that e-worksheet based on Tri-N in a two-variable linear equation system is valid and practical for improving junior high school students' creative thinking skills. It is hoped that the research can become a reference in further research to test the effectiveness of the e-worksheet.

**Keywords:** E-Worksheet, Linear Equation, Tri-N, Creative Thinking Skill

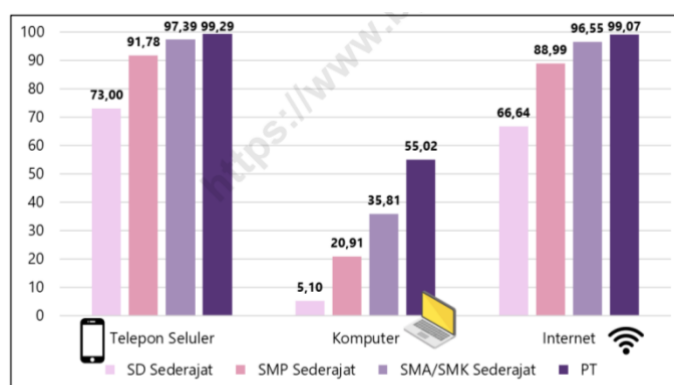
### **Introduction**

Technological developments in the 21st Century have made a change in society's paradigm, namely that the process of searching for and obtaining information is not only focused on print media, radio, and television but has also spread to cyberspace (the internet). This situation certainly affects various areas of life, including education. The results of the 2024 education survey conducted by the Central Statistics Agency



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(BPS) in Indonesia (can be seen in Picture 1) show that there are 91.78% of junior high school students actively use cell phones and 88.99% access the internet, in addition, there are 80.32% of students aged 5-24 years who are actively using mobile phones and accessing the internet (Badan Pusat Statistik Indonesia, 2024). These findings illustrate that the level of technology use by students in Indonesia is very high. Therefore, teachers and educational institutions need to develop learning innovations (media, worksheet, games, etc.) that harnesses technology. The use of technology in developing learning innovations is one effort to realize mathematics learning in the 21st century.



Sumber: Badan Pusat Statistik, Survei Sosial Ekonomi Nasional (Susenas) Maret 2024

**Picture 1.** Percentage of Students Aged 5–24 Years Using Mobile Phones, Computers, and the Internet by Level of Education, 2024

There are four 21st century skills, namely communicating, collaborating, critical thinking and problem solving, and creative and innovative thinking (Allen & Van der Velden, 2012; Bourn, 2018; Irfan et al., 2023; Lamb et al., 2017; Md, 2019). On the other hand, the current goal of Indonesian education is to create students who have Dimensi Profil Lulusan, one of which is creative thinking (Kementerian Pendidikan Dasar dan Menengah Republik Indonesia, 2025). Thus, mathematics learning that aims to improve creative thinking skills is learning that is in line with the challenges of the 21st century and the goals of current Indonesian education. Creative thinking skills are skills that have the characteristics of originality, fluency, flexibility and elaboration (Suherman & Vidákovich, 2022; Sulistyowati et al., 2022; Treffinger & Isaksen, 2013; Ulger, 2018). These characteristics can be achieved if students can provide many different, detailed and interesting ideas according to their point of view in relating certain concepts (Suherman & Vidákovich, 2022; Treffinger & Isaksen, 2013). This is one of the duties of an educator or teacher as a learning facilitator, to create appropriate learning activities so that students have creative thinking skills. One of the activities that can be carried out by teachers or educators that influences students' creative thinking skills in mathematics is worksheet (Effendi et al., 2021; Kwegyiriba et al., 2022; Petridou et al., 2022). Worksheets can be used by looking at students' characters and needs, so that learning can take place more meaningfully (Dwyer, 2002). However,

worksheets will be more interesting if they are electronic and adapt to the habits of junior and senior high school students in Indonesia, the majority of whom actively use the internet and smartphones (Badan Pusat Statistik Indonesia, 2024). Electronic worksheets (e-worksheets) are worksheets that students can access online, can be carried anywhere, and can be accessed anywhere, anytime according to the student's wishes. So, it is very efficient for students. But, the question is whether e-worksheets can effectively improve creative thinking skills. This is where appropriate methods are needed to develop worksheets that can improve creative thinking skills.

Based on preliminary observations conducted over a four-week period in January 2024 at an SMP in Yogyakarta, the study identified three primary challenges in mathematics learning. The observation was carried out using a semi-structured observation sheet and anecdotal records during System of Linear Equations in Two Variables (SPLDV). It was found: (1) students need to be guided by the teacher step by step in solving problems, meaning students cannot yet use problem-solving procedures; (2) students have difficulty answering different problems, meaning students have not been able to develop the ability to solve different problems; (3) students tend to be less active because they are distracted by gadgets to play online games. The first and second problems show that students are dependent on guidance from the teacher so students do not have the initiative to solve problems according to what they understand.

This shows the lack of students developing ideas independently (this is an indicator of originality in creative thinking skills) (Griggs & McGregor, 2012; Suherman & Vidákovich, 2022; Treffinger & Isaksen, 2013). Other studies have revealed that students' creative thinking skills in learning linear equations in Indonesia are still low, with the majority being at levels 1 and 2 (Dallyono et al., 2025; Novianti & Hidayat, 2020; Nurazhaar et al., 2021; Rasnawati et al., 2019). In addition, the lack of creative thinking skills is a challenge in solving linear equation problems (Krishnan & Eng, 2024). It means that students' creative thinking skills are still lacking. To strengthen indicators of originality, activities are needed that can facilitate students actively observing existing concepts, then being able to apply these concepts and being able to develop these concepts to solve different problems or in different contexts. This activity is related to the theory of Ki Hajar Dewantara's teachings, especially the Tri-N, namely *Niteni*, *Niroake* and *Nambahi*.

Tri-N has important meanings for us regarding discovery and innovation. Tri-N are key concepts used in recent literature on innovation theories. Tri-N emphasizes three important cognitive aspects of discovery and innovation, whatever the context (modern or traditional community, business or research enterprise, for-profit or non-profit enterprise). *Niteni* is a cognitive process/human mind that shows the ability to carefully recognize and capture the meaning (nature, characteristics, procedures, truth) of an object of observation, by observing, comparing in detail, being observant and deep, and involving all the senses. *Niroake* is the activity of imitating what is seen,

heard, and felt in the form of a good example or role model. This imitating behavior is not wrong, imitating is defined as duplicating oneself against a designer, or artist whose methods, enthusiasm, and how to process problems into good work, which is easy to digest and understand, is to be emulated. However, he stressed that this is not an omission in the practice of plagiarism, this is a learning process. *Nambahi* aims to create a better design and perfect it so that it makes an aesthetic experience with the realization of a finding, or possibilities, or a new meaning (Ermawati & Rochmiyati, 2020; Prihatni, 2014; Prihatni et al., 2019; Sulistyowati & Harini, 2021). The fourth problem can be solved by switching gadgets through using e-worksheets on smartphones. Of course, with e-worksheets that are interactive and adapt to the needs of students in class.

Based on the description, learning activities are needed, especially in learning linear equations, which can improve creative thinking skills as a 21st-century competency and the Pancasila Student dimension through Tri-N-based e-worksheets. Therefore, this research aims to develop linear equation e-worksheets Tri-N-based to improve junior high school students' creative thinking skills.

## Research Methods

This research is Research and Development (R&D). The product developed in this research is a Tri-N-based linear problem e-worksheet. Learning media including e-worksheets are suitable for use if the media is valid, practical, and effective (McKenzie & Padilla, 1986; Nieveen & Folmer, 2013; Wang et al., 2007). The study employed the ADDIE development model with 5 stages, namely Analysis, Design, Development, Implementation, and Evaluation (Almelhi, 2021; Istiqomah et al., 2023; Sulistyowati et al., 2024; Yu et al., 2021). However, this research is limited to testing validity and practicality, namely up to the development stage, because of limited time, classes, schedules, and midterm exams at nearby schools. Another reason is because the developed e-worksheet needs to be revised thoroughly before it is actually implemented to maintain the quality of the e-worksheet and this process needs to be done repeatedly (Esen et al., 2023). Focusing on these stages provides a robust foundation and a validated instrument that is a prerequisite for future effectiveness testing. This study was conducted from January 2023 to December 2024. To test the validity, it was conducted at Universitas Sarjanawiyata Tamansiswa because it has many validators who really understand Tri-N and to test the practicality, it was conducted at one of the junior high schools in Bantul, Yogyakarta, Indonesia which was selected randomly.

### *Research Target*

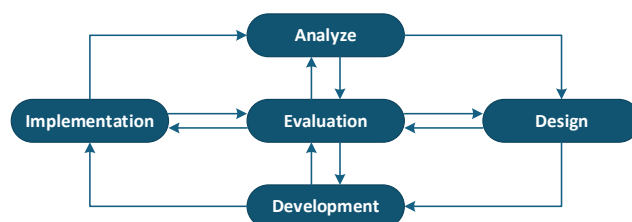
At the analysis stage, the objects are students, teachers, curriculum, relevant research on creative thinking skills, Tri-N, and e-worksheets. The subjects at this stage are the problems, findings, and research gaps that are the urgency of this research to be carried out and to determine the specific objectives of the e-worksheet developed.

Data at this stage are analyzed descriptively with a qualitative approach. The subjects at the design stage are researchers as developers of e-worksheets, while the objects at the design stage are tools, materials, and components in making e-worksheets that contain goals and indicators, software, worksheet specifications, worksheet structures, formats, and displays. The objects at the development stage of this research are drafts of e-worksheets of linear equations based on Tri-N.

The subjects of the validity test consisted of 2 mathematics education lecturers and 1 mathematics teacher. The two mathematics education lecturers selected have a track record of research that integrates Tamansiswa theories because this allows relevance in the integration of Tri-N in e-worksheets, while the teachers selected focus on practical implementation in class. The subjects of the practicality test were one class VIII consisting of 32 students in one of the junior high schools in Bantul Regency, Yogyakarta, Indonesia. The classes were selected by cluster random sampling from 5 classes. One class was chosen because at this stage the limited trial aims to find out the response in small-scale subjects to revise the e-worksheet. The determination of a sample size of one class is based on Fraenkel & Wallen's (2012) opinion regarding the use of intact groups in educational research, where a single intact group can be used as a research subject without changing the existing class structure. This is also supported by (Sugiyono, 2017), who stated that in a homogeneous population, a single cluster can be considered representative in describing the effects of a given treatment. This small-scale testing becomes an evaluation to apply on a large scale in the next stage.

#### *Research Procedure*

The research model used in this research is the ADDIE development model. The ADDIE development research model consists of 5 stages, namely Analyze, Design, Development, Implementation, and Evaluation (Almelhi, 2021; Istiqomah et al., 2023; Yu et al., 2021) that can be seen in Picture 2.



**Picture 2.** Stages of the ADDIE Model

In the figure above, it can be seen that the evaluation stage is always carried out before each stage moves to the next stage. The evaluation stage, which is carried out at each stage of the ADDIE model research, is called formative evaluation, while the evaluation carried out on the final product in the ADDIE model is called summative evaluation (Singh et al., 2021; Yu et al., 2021).

At the analysis stage, it can be considered a preliminary study in research and development. Analysis at this stage consists of: (1) analysis of research urgency, (2) analysis of student characteristics, (3) analysis of learning objective specifications from material content, (4) analysis of creative thinking skills, and (5) evaluation of analysis results. At the design stage, the researcher designed a Tri-N-based linear equation e-worksheet. The steps at this stage are: (1) reviewing the material, (2) selecting software and support media, (3) designing the product, and (4) evaluating the validation of the e-worksheet by experts. At the development stage, the linear equation e-worksheet is developed thoroughly according to the evaluation results of the previous stage and instrument development is carried out to improve the e-worksheet. The steps in this stage include: (1) making teaching materials according to the evaluation results, (2) validation of the e-worksheet by lecturers and teachers, (3) limited trial of the e-worksheet, (4) limited student evaluation for improvement before the implementation stage.

#### *Instruments, and Data Collection Techniques*

The data in this study consists of qualitative data and quantitative data. Quantitative data were collected using questionnaires during the design and development stages, while qualitative data were collected using observations and interviews during the analysis stage. Quantitative data collection aims to determine the validity of the developed e-worksheet and students' responses to the e-worksheet. The validity was assessed by three expert validators who consist of two lecturers and one mathematics teacher. The first lecturer holds a doctoral degree in Mathematics Education with over 10 years of experience in mathematics education. Meanwhile, the second lecturer holds a doctoral degree in Educational Technology and expert in Educational Technology specializing in digital learning media, and the teacher is a senior practitioner with more than 20 years of experience in junior high school mathematics instruction. Qualitative data collection is carried out to determine problems in the field as an analysis stage in development research. The instrument used to collect quantitative data is a questionnaire sheet. The instruments used to collect qualitative data are an observation sheet and an interview sheet.

#### *Data analysis technique*

Quantitative data in this research was analyzed using descriptive statistics. Statistical analysis is used on the results of the validity questionnaire and student responses, while descriptive analysis is used to interpret criticism and suggestions from validators and students. The qualitative data in this research was analyzed descriptively with the stages of data reduction, data presentation, verification and decision making (Creswell, 2009; Miles et al., 1994; Moleong, 2012; Taylor et al., 2015).

## **Results and Discussions**

This development research produces an e-worksheet based on Tri-N in learning two-variable linear equation systems to improve junior high school students' creative

thinking skills that have been tested for validity and practicality. Validity is measured based on expert assessment, while practicality is measured based on student responses to the e-worksheet. The developed e-worksheet can be accessed using a smartphone, PC, or laptop on the Liveworksheet online platform.

*The Result of The Analyze Stage*

At this stage, analysis and identification of problems are carried out through observation and interviews. Analysis at this stage consists of: (1) analysis of research urgency, (2) analysis of student characteristics, (3) analysis of learning objective specifications from material content, (4) analysis of creative thinking skills, and (5) evaluation of analysis results.

The interview results showed that students had difficulty and were confused in solving problems, especially non-routine problems, and had difficulty in making mathematical models based on the problems given. The difficulty in making mathematical models was because students were not yet able to understand the information from the problems given, as a result, the problems were not solved (Domínguez-García et al., 2016; MacGregor & Stacey, 1993; Maspupah & Purnama, 2020). The student also had difficulty applying algebraic operations with graphical methods to solve linear equation problems. From observations, the problems given were not read and not held by the students. In addition, when students were given simple questions to see their understanding of linear equations, students could not answer and did not respond according to what was asked. This shows that students do not master the concept of two-variable linear equations.

Based on observations and interviews with mathematics teachers, it shows that the teaching materials used in learning are not yet varied, namely: books from the government and simple worksheets that have not been tested. In deepening the material, students only read and solve the questions in the teaching materials. This triggers students to be lazy and tend to get bored, as a result, students' creative thinking skills are still lacking (Peeren, 2019; Strom & Strom, 2002). In addition, the digital learning media used is limited to YouTube, and teachers have never developed electronic teaching materials. What teachers do is provide questions from existing books and worksheets. The selection of digital-based media has a positive effect on student creativity, especially in providing enthusiasm and motivation for learning.

This is in accordance with previous research that learning technology is needed to reach students wherever they are, and increase student motivation in learning (Kebritchi et al., 2010; Khan et al., 2019; Muammar & Suhartina, 2018; Wann Nurdiana Sari et al., 2022). Another finding at this stage was that the average percentage of students' understanding of the two-variable linear system material was only 52%. This shows that the cognitive abilities of some students are still lacking. Based on observations and interviews, indicate that students' cognitive abilities are affected by limited teaching materials. To overcome this, it is necessary to develop contextual

teaching materials that stimulate student analysis and provide problems that support them in expressing various ideas and strategies for solving problems.

The results at this stage are (1) students' cognitive abilities are still lacking, including creativity in finding strategies to solve problems; (2) teaching materials available at school are limited to books from the government and simple worksheets that have not been tested; (3) learning is still dominated by teachers without involving students significantly. These findings are the basis for conducting an evaluation so that the main formulation is obtained in designing e-worksheets that will be developed according to the needs in the field.

#### *The Result of The Design Stage*

The activities carried out at the design stage are creating a product design to be developed along with research instruments. To create a Tri-N-based e-worksheet product design for learning linear equations, several things were done, namely (1) selecting a linear equation discussion, namely a two-variable linear equation system; (2) preparing a flow of learning objectives based on learning outcomes in the Independent Curriculum; (3) choosing an application for designing e-worksheets, namely using Canva, Liveworksheet, and Geogebra. After the tools and achievements have been selected, the content or components in the e-worksheet are selected, namely: cover, identity, foreword, table of contents, Tri-N description, learning objectives, concept map, study instructions, work instructions, summative evaluation, bibliography, and author profile. In the design, experts are also involved in providing comments and suggestions in the design of e-worksheets. The experts referred to here are lecturers who have experience in developing e-worksheets and Tri-N-based teaching materials. The nature of the lecturer here is not to be a validator but to guide in the design of e-worksheets so that fatal errors do not occur.

#### *The Result of The Development Stage*

This development stage is the third stage in the development model. As for this development stage, several steps are taken as follows:

##### *Making teaching materials*

This creation uses the Canva design application which is then transferred into the Liveworksheet platform so that students can access it. The steps in producing this Tri-N-based e-worksheet can be detailed as follows: (1) determining the material that will be made in the Tri-N-based e-worksheet, namely a two-variable linear equation system; (2) determine the form of learning that will be used, namely Tri-N-based learning; (3) designing Tri-N-based e-worksheet using Canva design application and Geogebra; (4) create a Liveworksheet account for teachers; (5) Enter "make interactive worksheet" then upload the Tri-N-based e-worksheet that has been made in Canva to be able to convert e-worksheet. Geogebra links are inserted into the Liveworksheet column so that students can access the graphs of the existing problems. (6) create Liveworksheet accounts for students. In this activity, a draft e-worksheet is produced which is ready to be tested for validity.

*The validity of e-worksheet*

After designing the e-worksheet, the validity of the e-worksheet is tested. The validating experts were two mathematics education lecturers and one junior high school mathematics teacher. Based on the results of the assessments that have been carried out, an average score is obtained for each aspect which can be seen in Table 1.

**Table 1.** Results of E-worksheet Expert Validation

Aspects assessed	Average	Category
Design and layout aspects	98.15%	Very Valid
Material and media aspects	97.66%	Very Valid
Language aspects	100%	Very Valid
Mean	98.60%	Very Valid

In Table 1, the overall average value regarding the validity of the e-worksheet developed is 98.60%, which is categorized as "Very Valid". So it can be concluded that Tri-N-based e-worksheets in learning two-variable linear equation systems have been tested for validity in improving junior high school students' creative thinking skills. Apart from statistical data, there are suggestions from validators which are then followed up. These suggestions and follow-up actions can be seen in Table 2.

**Table 2.** Validator Suggestions and The Revision

Validator	Suggestion	Revision
Validator 1	<ul style="list-style-type: none"> <li>It's best to make sure the cover image matches the contents of the e-worksheet</li> <li>In the next development, for the graphic method, take the numbers that intersect both axes and are round</li> <li>In the graphic method question, you should add the new word "sold"</li> </ul>	<ul style="list-style-type: none"> <li>Added graphic images to the cover of learning activity 1.</li> <li>There is no need to change the numbers in the questions, with input and approval from the validator</li> <li>Added the new word "sold" to the graph method example</li> </ul>
Validator 2	<ul style="list-style-type: none"> <li>Pay attention again to the concept of variables in the example made. Variables should represent unknown values, not objects. For example:</li> <li>Golden festival = <math>x</math>, should be, price of one gold festival ticket = <math>x</math></li> </ul>	Corrected the example in learning activity 1, providing an example of the graphic method
Validator 3	In further development, the questions are sorted from easy	Fixed in further development

*Student response to the e-worksheet*

The revised e-worksheet was then tested on students to determine student responses by distributing response questionnaires to 32 class VIII junior high school students. The student responses were collected using a Likert scale (1-4) and then converted into percentages for each criterion to illustrate the distribution of student

feedback across all assessment aspect. The results of student responses can be seen in Table 3.

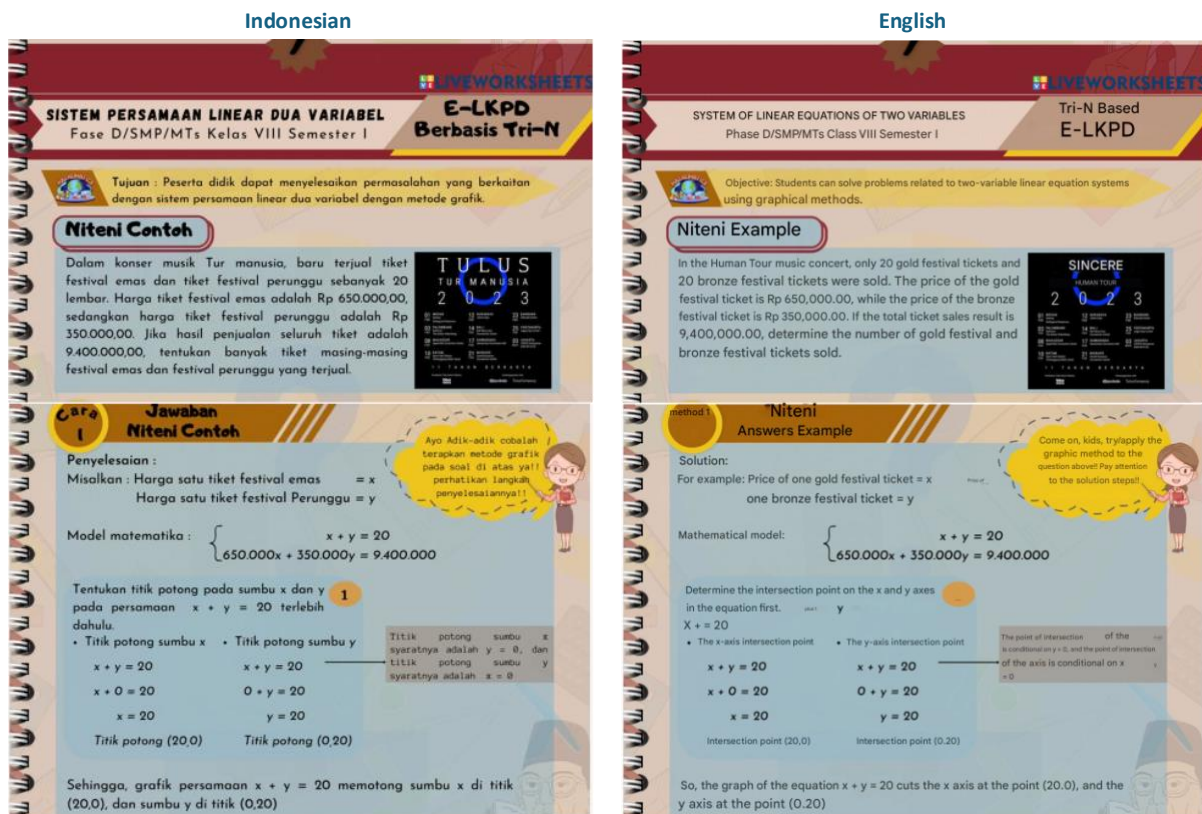
**Table 3.** Student Response to E-worksheet

Assessment Aspect	Mean per Aspect (%)			
	4	3	2	1
E-LKPD Display	76.04	23.96	0	0
Presentation of Material	61.72	38.28	0	0
E-LKPD Attractiveness	51.56	48.44	0	0
Usefulness of E- LKPD	53.13	46.88	0	0
Mean	60.61	39.39	0	0

In Table 3, it can be seen that the percentage of student response test results to the Tri-N-based e-worksheet that was developed was 60.61% of students responding strongly agree and 39.39% of students responding agree. This means that students gave a positive response to the e-worksheet that was developed. So it can be concluded that the Tri-N-based e-worksheet developed has been practically tested to improve creative thinking skills.

*The Reason E-worksheet can Improve Creative Thinking Skills*

Creative thinking skills are seen as an idea construction process that emphasizes aspects of fluency, flexibility, novelty (originality), and detail (elaboration) in understanding challenging problems (Griggs & McGregor, 2012; Suherman & Vidákovich, 2022; Treffinger & Isaksen, 2013). Students are said to be able to embrace originality if they are able to produce new or different things by connecting mathematical concepts or constructing new relationships in solving problems. This can be seen from the different answers of each student. Students are said to be able to embrace the fluency aspect if they are able to develop many ideas or concepts. Students are said to have the aspect of flexibility if they are able to view a problem from various points of view. Students are said to have an elaboration aspect if they are able to explain an idea or answer in more detail and interestingly. The four aspects of creative thinking abilities that have been described previously have been adapted in the e-worksheet that was developed. This adaptation can be seen in Picture 3.

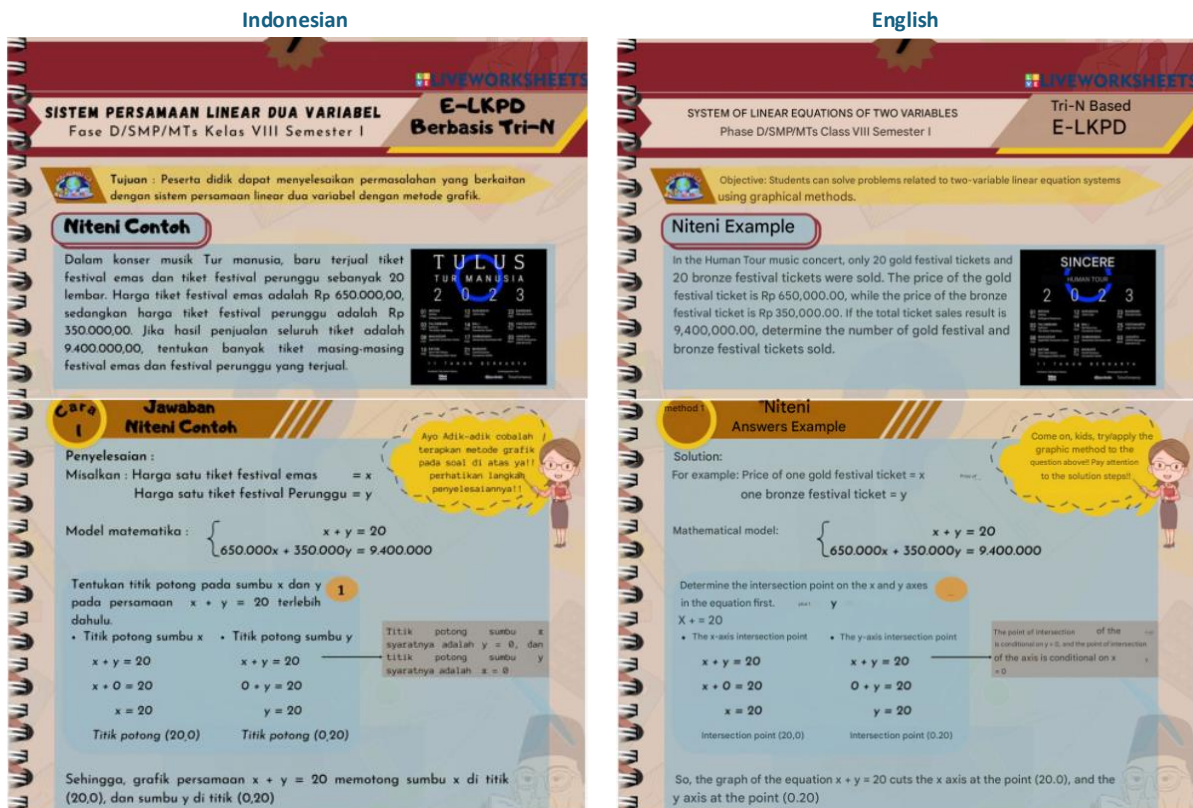


Picture 3. The Adaptation of Creative Thinking Skill Aspects in *Niteni*

The activity in Picture 2 above is an activity to solve contextual problems in discussing systems of linear equations with two variables. In this activity, students are given the opportunity to observe thoroughly, in detail and critically through *Niteni* activities. Apart from that, sparking questions are given which can stimulate students' skills in developing the ideas they have. Through this activity, students are invited to connect mathematical concepts or constructing new relationships in solving problems. This is in accordance with the aspect of originality in creative thinking skills (Suherman & Vidákovich, 2022; Sulistyowati et al., 2022; Treffinger & Isaksen, 2013). So indirectly, through *Niteni* activities students have developed the originality aspect of creative thinking skills.

Another adaptation to the e-worksheet appears in the Niroake activity which can be seen in Picture 3. In Niroake activities, students are given the opportunity to solve different problems using the concepts they have learned in *Niteni* activities. The existence of problems with different contexts invites students to look at a problem from various points of view to find procedures that are appropriate and connected to the concepts in previous activities. This activity has indirectly strengthened the flexibility aspect of creative thinking skills. In addition, the part with the red box in Picture 4 is a Geogebra Applet link for students to use to draw solution graphs freely in Cartesian coordinates. This means that students are given the opportunity to develop ideas in drawing graphics to solve the problems given. This is very in line with the fluency

aspect of creative thinking skills (Suherman & Vidákovich, 2022; Treffinger & Isaksen, 2013), so that indirectly this activity strengthens creative thinking skills, especially in developing new ideas.



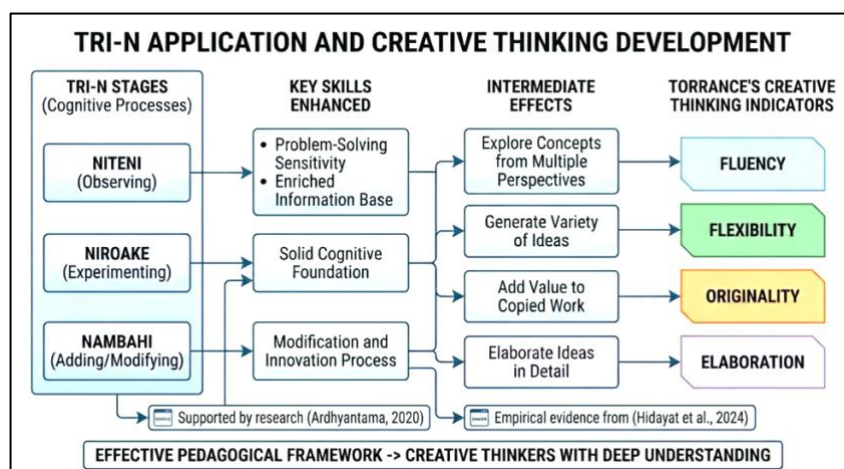
Picture 4. The activity in *Niroake* and *Nambahi*

The next activity in the e-worksheet that adapts creative thinking skills is *Nambahi*. In the *Nambahi* activity, students are given different problems and require the ability to connect various concepts, especially relating them to the concepts obtained in the *Niteni* and *Niroake* activities. However, in the *Nambahi* activity, students are very free to answer using any strategy but are still directed at the previous concept. This freedom gives students the opportunity to apply interesting and unique strategies, and can even find the most effective and efficient way to solve problems. Indirectly, this activity encourages students to use interesting, unique ideas and be more efficient (elaboration) (Asrul et al., 2018; Ipung Kurniawan Yunianto, 2014; Suherman & Vidákovich, 2022). Therefore, in the *Nambahi* activity, creative thinking skills are achieved through these elaboration activities. In other words, the e-worksheet developed can strengthen creative thinking abilities because of the Tri-N activities embedded in the e-worksheet. Although this study focuses on development, previous empirical research has verified that Tri-N activities significantly improve students' fluency, flexibility, and elaboration (Fitrotun Nisa et al., 2019; Krisnajati et al., 2024; Widodo et al., 2024). In addition, the e-worksheet developed in the study

contains story questions that use contextual problems, so that it can help students improve their creative thinking skills. This is also relevant to research which states that problems in the form of story questions can improve creative thinking skills because students need creative and critical skills in solving problems. This is also relevant to another research which states that problems in the form of story questions can improve creative thinking skills because students need creative and critical skills in solving problems (Bevan & Capraro, 2021; Sachdeva & Eggen, 2021; Taley, 2022; Wijayanti et al., 2021).

The application of the Tri-N has been empirically proven to foster creative thinking skills through systematic cognitive stages. The *Niteni* stage plays a role in honing problem-solving sensitivity and enriching students' information base, which directly improves Fluency and Flexibility indicators. This is supported by research (Ardhyantama, 2020), which demonstrates that the Tri-N-based learning model enhances elementary school students' creative thinking skills by providing them with opportunities to explore concepts from multiple perspectives before attempting to solve them. By observing (*Niteni*) and experimenting with existing patterns (*Niroake*), students build a solid cognitive foundation to generate a wide variety of ideas.

In the next stage, *Nambahi* undergoes a process of modification and innovation, which is strongly correlated with the Originality and Elaboration indicators. Empirical evidence from (Hidayat et al., 2024) study in the context of mathematics learning reveals that students who went through the Tri-N process had higher originality scores than those in control classes, as they were encouraged to add value or update the copied work. Through *Nambahi*, students not only replicate information but also elaborate on their ideas in specific detail. Thus, the synchronization of this local wisdom with Torrance's indicators creates an effective pedagogical framework for producing creative thinkers who remain grounded in a deep understanding of concepts. This relationship can be seen in Picture 5 below.



Picture 5. The Relationship Tri-N Activity with Creative Thinking

Based on the results and discussions that have been described, learning a two-variable linear equation system with the help of Tri-N-based e-worksheets can be used as alternative learning to strengthen creative thinking skills which are 21st-century skills. This e-worksheet is also one of the teaching materials that can accommodate students' pleasure in using smartphones so that smartphones can be useful for the development of their skills.

### Conclusions and Suggestions

Based on the research results, it was concluded that the Tri-N-based e-worksheet on two-variable linear equation systems has been tested for validity and practicality to improve junior high school students' creative thinking skills. This can be seen from the results of the validity test which was categorized as very valid at 98.60% and the results of the practicality test showed that students gave a positive response of 60.61% strongly agreeing and 39.39% agreeing. Future research could focus on broader experimental studies to accurately assess the significance of e-worksheets in improving students' creative thinking skills. Furthermore, future researchers could apply the Tri-N approach to other mathematics topics to expand its benefits. Finally, further studies are needed to determine whether students' creative habits continue to develop even after they have completed using e-worksheets.

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