



E-Learning Tri-N Based Interactive to Improve Student Learning Motivation in Statistics Learning

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ABSTRACT

This study aims to develop an interactive learning media based on e-learning using Google Sites with the Tri-N approach (Niteni, Nirokake, Nambahi) to enhance students' learning motivation in the Statistics material for eighth-grade junior high school students. The research method employed is Research and Development (R&D) using the 4D development model, consisting of the Define, Design, Develop, and Disseminate stages. Data were collected through initial needs observation and product validation by media and material experts. The product developed is an interactive e-learning media containing teaching materials, instructional videos, practice exercises, and assessments based on the Kurikulum Merdeka. This media is designed to facilitate students' learning activities through the stages of Niteni, Nirokake, and Nambahi, with the expectation of encouraging active participation in the learning process. Due to time limitations, this research was conducted only up to the expert validation stage; practicality and effectiveness tests were not carried out. The validation results indicate that the Tri-N-based e-learning media is suitable for use in Statistics learning. In the future, this media has the potential to be further developed for other materials and educational levels as an innovative digital learning alternative for teachers and students.

Keywords: E-Learning, Tri-N, Learning Motivation, Statistics.

ABSTRACT

Penelitian ini bertujuan untuk mengembangkan media pembelajaran interaktif berbasis e-learning menggunakan Google Sites dengan pendekatan Tri-N (Niteni, Nirokake, Nambahi) guna meningkatkan motivasi belajar siswa pada materi Statistika kelas VIII SMP. Metode penelitian yang digunakan adalah Research and Development (R&D) dengan model pengembangan 4D yang terdiri atas tahap Define, Design, Develop, dan Disseminate. Proses pengumpulan data dilakukan melalui observasi kebutuhan di lapangan serta validasi produk oleh ahli media dan ahli materi. Produk yang dikembangkan berupa media e-learning interaktif yang memuat materi ajar, video pembelajaran, latihan soal, dan asesmen berbasis Kurikulum Merdeka. Media ini dirancang untuk memfasilitasi aktivitas belajar siswa melalui



tahapan *Niteni*, *Nirokake*, dan *Nambahi*, sehingga diharapkan mampu mendorong partisipasi aktif siswa dalam proses pembelajaran. Penelitian ini hanya sampai pada tahap validasi ahli karena keterbatasan waktu, sehingga uji kepraktisan dan uji efektivitas belum dilaksanakan. Hasil validasi menunjukkan bahwa media e-learning berbasis Tri-N layak untuk digunakan dalam pembelajaran Statistika. Ke depannya, media ini berpotensi dikembangkan lebih lanjut pada materi lain dan jenjang berbeda sebagai alternatif pembelajaran digital yang inovatif.

Kata Kunci: E-Learning, Tri-N, Motivasi Belajar, Statistika

INTRODUCTION

Generation Z and Alpha are in the era of the industrial revolution 4.0, where the sophistication of digital technology is an effort to improve by integrating everything into the world of the internet (Tjandrawinata, 2016). The tendency in the Z and Alpha generations is to do everything instantly, not wanting to use a method that has a long process (Fauzi & Tarigan, 2023). The industrial revolution 4.0, especially in the field of education, continues to experience changes. The Industrial Revolution not only brings negative impacts but also positive impacts. Seeing from the Z and alpha generations have high levels of productivity, not only that, they tend to be more creative and innovative and have a wide social media network. The use of this technology depends on each individual. If you want to have a negative impact, then use technology only for fun without getting any benefits from it, resulting in laziness due to automation (Hakim & Yulia, 2024; Prasetyo & Trisyanti, 2018; Wahyudi et al., 2024). On the other hand, if you want to have a positive impact, then use digital technology so that you can gain benefits in your daily life (Sudargini & Purwanto, 2020). In education, knowledge of many things is important. In the era of Industry 4.0, technology is actually needed as a qualified learning tool.

The development of digital technology in the form of website media is widely used by people in writing blog activities, science, current news and others. One of the easy technological developments is e-learning. E-learning, is electronic learning is a digital forum used in electronic-based learning such as LAN, WAN, and the internet (Aidah, 2019; Chusna, 2019; Dewi, 2021). One example of e-learning is Google Sites. This platform is a type of wiki, which is a collaborative web space where anyone can create and edit published content (Tavares et al., 2012). This platform can be a learning medium that supports learning activities, provides a fun learning experience in practicing, seeking knowledge, and becomes an effective learning alternative (Kompem et al., 2019). Therefore, the use of Google Sites is suitable for students because most of them are digital natives. Digital natives are a generation that lives in an era of developing digital technology. In other words, the digital native generation can depend on developing technical skills in education can know the knowledge first before learning in school begins (Bennett et al., 2008). Google sites development can be made into an interactive web-based learning which contains materials, practice questions, remedial, and evaluation. Of course, the Google Sites development can use Tri-N (*Niteni*, *Nirokke*, *Nambahi*), based on which students can learn the concept of learning correct science and make it easier for students to learn mathematics.

Tri-N is Tamansiswa's teachings are in the form of operational guidelines or practical guidelines known as the *niteni*, *nirokke*, and *nambahi* (Damayanti & Rochmiyati, 2019; Widada, 2020;

N. Wijayanti et al., 2021). *Niteni* which means to recognize deeply, can be absorbed in the mind and remembered (Andayani et al., 2021; N. Istiqomah et al., 2021; Latifah et al., 2024; Nisa et al., 2019). Teachers in learning must have taught the concept so that students can understand the learning well, for example, teaching with lecture methods, demonstrations, and other methods that are adjusted to the needs of their students. *Nirokke*, which means imitating what has been *titeni* or recognized more deeply, something that is being studied, is included in the realm of *cipta* (creativity), *rasa* (feeling) and *karsa* (will) (Rahayu et al., 2017). *Cipta* refers to the skills to think, generate ideas, and understand things. It is closely related to the cognitive aspect, which includes the processes of thinking, reasoning, and problem-solving. Therefore, creativity is usually identified as a cognitive aspect in Bloom's taxonomy. *Rasa* encompasses aspects of feelings, emotions, and values. It relates to the affective domain, which involves attitudes, interests, appreciation, and how a person perceives and responds to the world around them. Therefore, *rasa* is usually identified as the affective aspect in Bloom's taxonomy. *Karsa* refers to will, drive, and concrete action. It is closely related to the psychomotor domain, which encompasses motor skills, physical actions, and how a person acts based on thoughts and feelings. Therefore, *karsa* is usually identified as a psychomotor aspect in Bloom's taxonomy.

Thus, the *nirokke* process is not merely passive imitation, but rather encompasses open-minded activities involving creativity, feeling, and will. All three fully reflect the cognitive, affective, and psychomotor domains in Bloom's taxonomy, which complement each other in the learning process. Students' imitation must be accompanied by understanding, a reflective attitude, and concrete actions that encourage personal development. This is where the role of *nambahi* becomes crucial, namely encouraging students not to stop at the process of imitation, but to be able to develop their knowledge and skills through practice, experience, and reflection. Therefore, the Tri-N teachings can be an effective guideline for forming a meaningful learning process, particularly in helping students solve mathematical problems comprehensively.

In learning, after the teacher explains, the students will imitate according to what is taught. Of course, this imitation must be able to think openly, meaning that the information received by students is not necessarily true; therefore, in learning, students must be able to develop. Then, *add* which means after studying and being able to imitate it is expected to be able to develop (A. Wijayanti et al., 2022). Like the previous concept, *adding* means developing students are expected to develop through exercises given by the teacher. Tri-N guidelines can guide students' problems in learning mathematics.

Mathematics learning at school is a difficult subject to understand. Many students have difficulty learning to understand concepts, principles and solving problems in everyday life (Amallia & Unaenah, 2018). Many factors cause difficulties in learning mathematics. Internal factors that exist within the student's personality can be intelligence, interests, talents, emotions, physical, and attitudes (Djarwo, 2020). External factors, which influence the individual's personality, come from outside in the form of family, school, society, and peers. In the current learning curriculum, students are asked to think critically using mathematical reasoning. Sometimes students have difficulty understanding the material, a lack of focus in learning, and a lack of motivation to learn (Andriani &

Rasto, 2019; Arianti, 2018; Palittin et al., 2019). According to (Permatasari & Nuraeni, 2021), a lack of learning motivation is one of the factors that affects students' difficulties in understanding mathematical connections, where students' ability to solve problems becomes less optimal. The higher the quality of learning implemented at school and home, the greater the chance of achieving learning success. Furthermore, (Mediyani & Mahtuum, 2020) explained that students often have difficulty determining the principle of using formulas to solve problems due to limited conceptual understanding and logical mathematical reasoning. Therefore, digital technology-based education is considered important to increase students' learning motivation, especially in materials perceived as difficult, such as statistics.

The statistical material is closely related to data, real-life facts, data processing, and decision-making based on available information (Hanifah et al., 2020). Statistics material contains various problem-solving in the fields of economics, industry, health, finance, trade and other fields. Learning at the elementary school level introduces several sub-chapters of material on mean, median, and mode. To facilitate learning in statistics material, collaboration with digital technology is needed to become an e-learning (I. Istiqomah & Sulistyowati, 2021). E-learning with Google Sites introduces easy features to edit a work. It is undeniable that in Google Sites, students not only learn the material and solve problems but also learn the correct learning concept with Tri-N (Niteni, Nirokake, and Nambahi). The most important thing in learning is how students can add to the knowledge that has been learned. Most of the students in mathematics learning understand the formula, but cannot think logically about using the formula to solve math problems.

previous research results showed that the use of Google Sites combined with Quizizz could support student engagement in learning mathematics, particularly in statistical topics (Nurhayati et al., 2020). The study concluded that learning through a website-based platform allowed students to review lessons flexibly, without being limited by time and place. Additionally, integrating Quizizz exercises into the Google Sites platform helped improve students' abilities in presenting statistical data. The gap This study shows the need to develop more interactive media according to the Tri-N approach. Then, continuously, teaching materials with Google Sites can be developed with different materials and with updates that are adjusted to the times. The updates of this e-learning are based on Tri-N teachings from Ki Hajar Dewantara and are specifically for statistical material (Knowing Data) for class VII. Therefore, this study aims to develop e-learning based on Tri-N (*Niteni, Nirokke, and Nambahi*) to increase the learning motivation of class VII students in statistics learning.

METHOD

This study uses research and development methods which aims to improve, develop and evaluate the education system (Yuliani & Banjarnahor, 2017). This study aimed to develop a Tri-N-Based Interactive E-Learning to increase student motivation in learning statistics. The research method used the 4D development model. They are defined, design, develop, disseminate (Thiagarajan, 1974). However, this study was conducted only up to the development stage, which involved validation by expert lecturers and mathematics teachers. This stage aims to obtain feedback

and judgments regarding the feasibility, content validity, and media design before the product is tested on students, in line with standard R&D procedures (Habibah, 2019).

At the validation stage, practicality tests and product effectiveness evaluations are carried out. Product development involves testing for reliability and validity through assessments by validators. In educational research, the feasibility of the product is typically examined by at least three validators, including media experts and material experts. Following this, practicality tests are conducted to assess students' responses to the developed product (Atmaja & Murtadho, 2021; Sari & Munir, 2023; Siregar & Siregar, 2024; Sutrisno & Puspitasari, 2021). Then the effectiveness test will be tested for suitability and effectiveness for use on students with product trials by conducting post-tests and pre-tests on students. The limitations of research and development products only reach the validation stage through media and material experts. This is because the research time does not allow it to be carried out in a short time / the material in the educational unit is not yet appropriate for the trial stage.

Data collection techniques using questionnaires and unwritten interviews. Questionnaires are a data collection technique that is filled in the form of questions or statements provided with a certain assessment scale. There are two types of data analysis techniques, namely Qualitative data obtained from the results of unwritten interviews in the form of criticism and suggestions from media experts, material experts, and mathematics teachers. This data is analyzed descriptively to determine the weaknesses and strengths of the media, and is used as a basis for product revision. Quantitative data analysis is obtained Quantitative data is obtained from the results of a media feasibility questionnaire filled out by media experts and material experts. Each statement in the questionnaire is assessed using a Likert scale of 1–5, which can be seen in the five-point conversion table, then analyzed by calculating $\bar{X} = \frac{\sum x}{n}$. With \bar{X} is the average score, n is the number of questions, and $\sum x$ is the number of question scores. Then the average value of the total score of each aspect is converted into qualitative data in the form of a product feasibility level. The conversion guidelines for the 5-scale assessment are in Table 1.

Table 1. Five-point Scale Assessment Conversion Guidelines

No.	Score Range (i)	Category
1.	$\bar{X} > \bar{X}_i + 1,8 SBi$	Very Good (SB)
2.	$\bar{X}_i + 0,6SBi < \bar{X} \leq \bar{X}_i + 1,8SBi$	Good (B)
3.	$\bar{X}_i - 0,6SBi < \bar{X} < \bar{X}_i + 0,6SBi$	Enough (C)
4.	$\bar{X}_i - 1,8SBi < \bar{X} \leq \bar{X}_i - 0,6SBi$	Less (K)
5.	$\bar{X} \leq \bar{X}_i - 1,8SBi$	Very Poor (SK)

Source: (Nuritha & Tsurayya, 2021a)

Based on the explanation in Table 1, it can be obtained the conversion of quantitative values 1 to 5 into qualitative categories to conclude the level of feasibility of the developed learning media. If the values and are substituted into the assessment category criteria formula in table 1, then the five-scale assessment is presented in Table 2.

Table 2 Five-point Scale Assessment Conversion Guidelines

No.	Score Range (i)	Category
1.	$\bar{X} > 4,2$	Very Good (SB)
2.	$3,4 < \bar{X} \leq 4,2$	Good (B)
3.	$2,6 < \bar{X} \leq 3,4$	Enough (C)
4.	$1,8 < \bar{X} \leq 2,6$	Less (K)
5.	$\bar{X} \leq 1,8$	Very Poor (SK)

Nuritha and Tsurayya (2021)

Then the percentage calculation of the overall score of the interactive e-learning media assessment category criteria with Google Sites on a five-point scale. Based on the guidelines, the percentage range of each category is obtained. More details are presented in Table 3.

Table 3: Percentage of Five-point Scale Assessment

No.	Score Range (i)	Category
1.	$\bar{X} > 84\%$	Very Good (SB)
2.	$68\% < \bar{X} \leq 84\%$	Good (B)
3.	$52\% < \bar{X} < 68\%$	Enough (C)
4.	$36\% < \bar{X} \leq 52\%$	Less (K)
5.	$\bar{X} < 36\%$	Very Poor (SK)

Nuritha and Tsurayya (2021)

The eligibility of interactive e-learning media using Google Sites uses minimum assessment criteria that are included in the "Good" category. If the learning media assessment gets a good category, then the media is "worthy" of use.

RESULT AND DISCUSSION

The results of the study in the form of e-learning using Google Sites media based on Tri-N in statistics learning. Learning media used to increase student learning motivation and understand basic statistical concepts, following the curriculum guidelines. This research and development use a 4D development stage model (define, design, develop, and disseminate).

Define

The define stage contains initial and final analysis, student analysis, task analysis, and learning objective analysis. In the define stage (development), before designing a product, it is better to find sources both in literature and in fact in the field by conducting observations. This study uses literature sources from previous studies that focus on increasing student motivation.

1. Front-end Analysis:

The initial analysis of this development research is to find and determine the basic problems faced in learning mathematics. In this case, the study includes the curriculum used and problems in the field that are often faced by students, so that solutions to these problems are obtained. Through the introduction of the research above, it is explained that the problems of students in learning are students' lack of learning motivation, so that students' difficulties in understanding the material explained by the teacher are less than optimal. Based on the analysis of the problems above, teaching materials are needed that can help students improve their learning motivation which contain basic concepts, practice questions in the form of diagnostic,

affective, and summative competencies, and then learning videos that contain the suitability of the material according to the independent curriculum and renewal based on Tri-N (Niteni, Nirokake, and Nambahi). In accordance with the problems above, teaching materials are used in the form of e-learning based on Google Sites. With the teaching materials that are developed, it can help students learn independently, as well as being a solution to the problems experienced by students.

2. Student Analysis

The student analysis aims to analyse students through interviews with teachers or material experts of SMPN 1 Tempuran. The following are the results of interviews with teachers related to student problems (a) lack of learning media used in learning, (b) the handbook used is only on loan from the library, (c) students are less motivated to read textbooks, (d) the learning method used by the teacher is a lecture, and (e) students quickly get bored and sleepy in mathematics learning.

Based on the interview results, further development was carried out regarding e-learning teaching materials with Google Sites based on Tri-N to increase students' learning motivation in statistics learning.

3. Task Analysis

Task analysis contains a review of the content of learning materials that understand and formulate the objectives of creating Google Sites-based e-learning. In general, statistics learning materials refer to Learning Objectives (TP) and Learning Outcomes (CP) and Statistics material (Recognising Data) for grade VII of junior high school. Guidelines for analysing learning objectives and achievements are following the independent curriculum.

4. Concept Analysis

At this stage, the product is developed by creating e-learning media content with Google Sites based on Tri-N from Learning Objectives (TP) and Learning Outcomes (CP) in accordance with the independent curriculum. Based on the content of the learning media associated with the material, some concepts are interrelated and relevant. The following is an explanation of the Learning Objectives (TP) and Learning Outcomes in the Statistics material presented in Table 4.

Table 4. Learning Objectives and Learning Achievements

Learning Objectives (TP)	Learning Outcomes (CP)
a. Through this material, students are able to determine data centralisation (mode, median, and average) properly and correctly.	At the end of phase D, participants can formulate questions, collect, present, and analyse data to answer questions. They can use diagrams and pie charts to present and interpret data. Students can take a representative sample of a population to obtain data related to the students' environment.
b. Through this material, students are able to determine the size of data distribution (Range, quartiles, and quartile deviations) properly and correctly.	
c. Through this material, students are able to solve everyday problems related to central measurements properly and correctly.	
d. Through questions, students can solve everyday problems related to distribution measurements properly and correctly.	

Design

At the development stage, the research must further examine the advantages and disadvantages of the learning media used. As well as the selection of design formats used in learning media, and the initial design of the media. A more detailed explanation of the development stages will be presented in Table 5.

Table 5. Advantages and Disadvantages of Google Sites

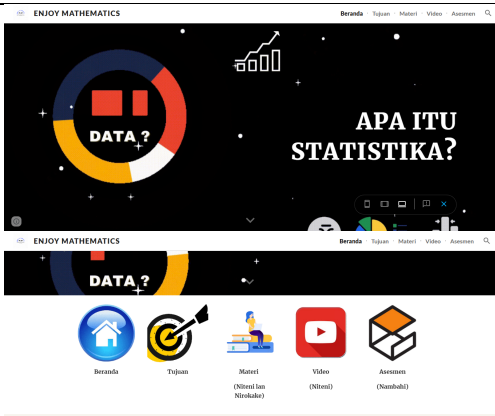
Google Sites Advantages	Disadvantages of Google Sites
<p><i>Google Site can</i> add Analytics, Webmasters Tools, and of course, adsense functions easily and practically</p> <p>To share a website, simply copy the code.</p> <p>Can be used on devices or gadgets as a viewer</p> <p>Stored on Google.com, so it is easy to index the pages that will be installed.</p>	<p><i>Google Sites does</i> not provide a drag-and-drop feature to design web pages.</p> <p>Changes are made manually with the device</p> <p><i>Google Sites does</i> not support scripts and iframes on its pages.</p> <p>Not all gadgets are commonly used for iframe and script services because Google Sites does not support these services.</p>

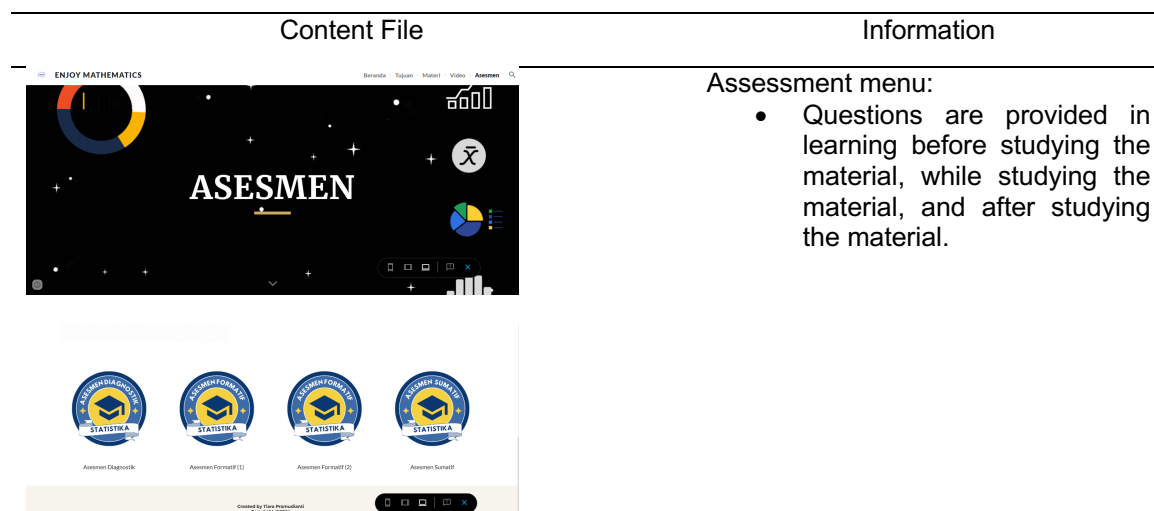
The advantages and disadvantages in Table 5 serve as a basic reference for development research to create e-learning media with Google Sites.

The selection of formats in creating e-learning media with Tri-N based Google Sites is made as attractive as possible and equipped with full colour and interactivity. The format used in designing Google Sites uses Statistics material for grade VII SMP, following the independent curriculum, which refers to Learning Achievements and Learning Objectives.

At this stage, the preparation of e-learning media based on the website with statistical material is carried out. Content is created using free or paid editing applications using Canva. At the beginning, it starts with a homepage with the menu provided, such as: objectives, learning videos, materials and assessments. The menu is located on the homepage or in the three-line icon option. The media draft for further details can be seen in Table 6.

Table 6. Design of Interactive E-Learning Learning Media with Google Sites.

Content File	Information
	<p>Home Menu</p> <ul style="list-style-type: none"> At the top, several menus are displayed that can lead to objectives, materials, videos, and assessments.



Expert Appraisal (Develop)

The Development Stage produces an e-learning website learning media product using Google Sites, followed by a product revision that has been validated based on input, criticism, and suggestions from media experts and material expert validation to produce a product that is suitable for use. The following are the results of media expert and material expert validation by two lecturers and one mathematics teacher, as considerations for product revision.

1. Media Expert Validation

Media expert validation was conducted to determine the quality of the developed learning media in the form of e-learning learning. Therefore, the media experts in this study were Mr. Irham Taufiq S.Si, M.Sc, as media validator 1 and Mr. Denik Agustito, S.Si, M.Sc, as media validator w, who were requested in the study to provide assessments and suggestions for the products that had been developed. The media was validated by filling out the assessment instrument sheet and providing responses and suggestions as a reference for revising the developed product. In media validation, an assessment was provided in terms of the content feasibility component, presentation component, language component, and graphic component, containing 13 statements. The Table 7 is a presentation of quantitative data from the results of media validation.

Table 7. Results of the average scores for all aspects of media experts and material experts

Assessment Components	Media Expert 1	Media Expert 2
Total Score	51	51
Score Percentage	78%	78%
Score Interval	$44 < X \leq 55$	$44 < X \leq 55$
Average Score	3.9	3.9
Category	Good	Good

Based on the data in the image above, the percentage of the assessment results by media experts on each statement item on e-learning media with Google Sites totalled 78% where the validation results were between 68% -84% and the five-scale conversion guidelines with a result of 3.9 were stated as good according to the validity level criteria. This can be reviewed in terms

of the content feasibility components, presentation components, language components, and graphic components in the assessment of e-learning media with Google Sites, based on Tri-N, which was developed and categorized as "Good". While the qualitative data was obtained in the form of comments and suggestions, both written and unwritten, from media expert validators. The following are the results of qualitative data presented in Table 8.

Table 8. Comments/Suggestions from Media Expert 1 and Media Expert 2

Validation	Comments/Suggestions
Media Expert 1	<ol style="list-style-type: none"> 1. Learning Objectives should not be capitalised. 2. A lack of contrast between text and background. 3. There are no videos yet about the explanation of the material. 4. The choice of a blue background is less child-friendly. 5. The font type is uniform and chosen one that it is easy to read, not too small.
Media Expert 2	Quite good, for a score of 3, please improve it for the sake of perfecting the media.

2. Subject Matter Expert Validation

Validation of material experts was conducted to determine its relevance to competencies that are adjusted to junior high school mathematics learning with class VII statistics material. Validation of material experts was conducted by a mathematics teacher, namely Markus Puwadi, S.Pd. In the validation of the material, there is an assessment in terms of the components of content feasibility, presentation feasibility components and language feasibility components, and graphic components containing 12 statements. Material experts are asked to provide assessments and suggestions for the products that have been developed. The material is validated by filling out an assessment questionnaire sheet and providing responses and suggestions as a reference for product revision. The following is a presentation of quantitative data from the results of material validation in diagram 4, and the average results of all aspects are presented in Table 9.

Table 9. Results of the average scores for all aspects of media experts and material experts

Assessment Components	Media Expert
Total Score	58
Score Percentage	96%
Score Interval	$X \geq 50$
Average Score	4.8
Category	Very Good

Based on the data in the image above, the percentage of the assessment results by media experts on each statement item on e-learning media with Google Sites is 96% where the validation results are 84%-100% and the five-scale conversion guidelines with a result of 4.8 are stated as very good according to the validity level criteria. This can be reviewed in terms of the content feasibility components, presentation components, language components, and graphic

components in the assessment of e-learning media with Google Sites, based on Tri-N, which was developed is categorized as "Very Good". While the qualitative data was obtained in the form of comments and suggestions, both written and unwritten, from media expert validators. The following are the results of qualitative data presented in Table 10.

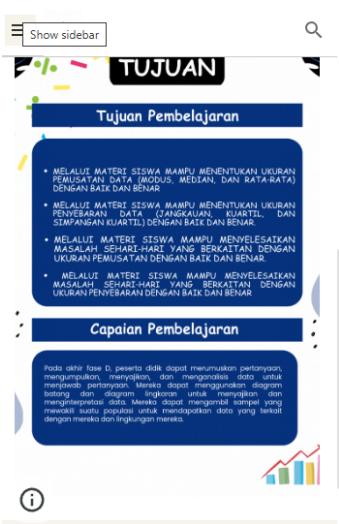

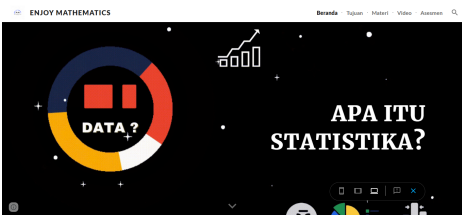
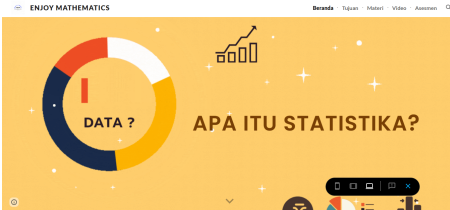
Table 10. Comments/Suggestions from Material Experts

Validation	Comments/Suggestions
Subject Matter Expert	Examples of questions in the discussion of the material have been added and are more varied.

3. Product Revision

The product revision stage is carried out by following comments/suggestions from media experts and material experts who have provided validation. The following are revisions before and after the interactive e-learning media development product with Google Sites, based on Tri-N, presented in Table 11.

Table 11. Comments/Suggestions from Material Experts

Before Revision	After Revision
 <p>Learning Objectives still use capital letters and have not been revised</p>	 <p>Learning Objectives: Use capital letters only at the beginning of a sentence, as in the Indonesian language rules. All fonts are the same.</p>
	



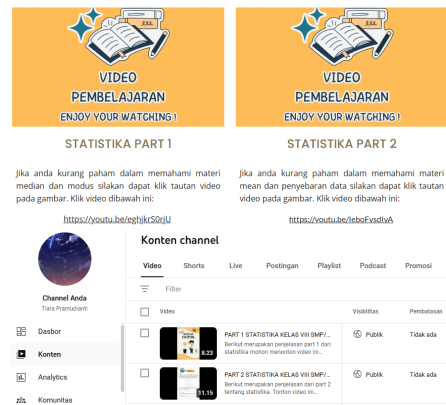
The background colour is still dark blue, not very attractive, and there is not enough contrast between the writing and the background.



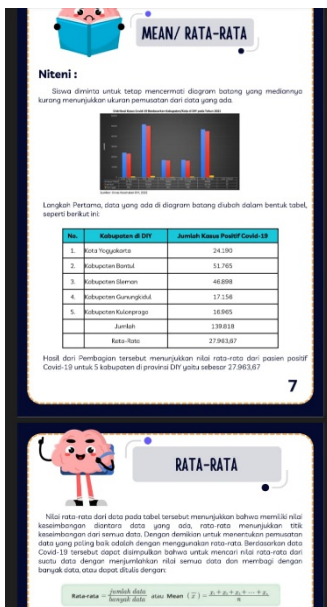
The unfriendly blue colour has been replaced with bright yellow so that children are motivated to participate in e-learning.



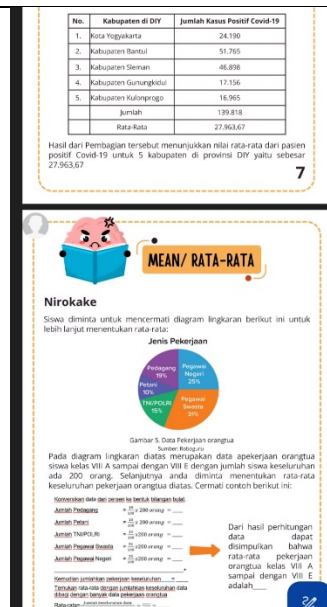
Still using other sources YouTube videos.



Learning videos about material explanations have been included.



Example questions in the material discussion have not been added



Example questions in the discussion of the material have been added

At the revision stage, e-learning products are expected to be developed into products that are much better at learning statistical materials and can motivate students in learning. The update

of this research lies in the use of the Google Sites platform, which is more flexible and can be accessed without time limits. Implementation of the Tri-N approach in developing Statistics materials. Focus on Statistics material for class VII, which is rarely the focus in developing Tri-N-based e-learning media. Then, e-learning is a means to accustom students to learning gradually, actively, and independently, according to the educational principles of Ki Hajar Dewantara.

CONCLUSION

Based on the research and development of interactive e-learning media products with Google Sites, based on Tri-N, which has been done. From the explanation above, it can be concluded that (1) this research and development has produced e-learning statistics teaching materials with Google Sites based on Tri-N for junior high school students in the 2024/2025 academic year through three stages of 4D development, namely Define, Design, and Development, which are limited to testing the validity of a product. (2) based on the validation of teaching materials by expert material validators and media experts, it was obtained: The results of the media expert validation, which assessed the components of content feasibility, presentation, language, and graphics for the Tri-N-based e-learning media using Google Sites, obtained an average score of 3.9 on a scale of 1–5, falling into the "Valid" category. Meanwhile, the material expert validation covering the same components produced an average score of 4.8, categorised as "Very Valid". Overall, the quality of the teaching materials based on expert validation achieved an average score of 4.35, placing it in the "Very Feasible" category. The research results indicate that the Tri-N-based e-learning media product has excellent quality based on expert validation. However, due to time constraints, this study was limited to the expert validation stage only and did not proceed to practicality or effectiveness testing. Therefore, further development and testing are necessary to fully optimise and effectively implement this media in learning.

Then the research and development of interactive e-learning media products with Google Sites based on Tri-N that has been carried out has the following shortcomings, benefits and suggestions (1) the scope of the material developed is still limited to Statistics (Understanding Data) for grade VII of junior high school, so it does not cover all the basic competencies in the curriculum, and (2) the media features are still simple, especially in terms of graphics and interactive question variations, which can still be improved to make them more interesting and varied.

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