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DEVELOPMENT OF INTERACTIVE LEARNING MEDIA USING THE LUMIO PLATFORM FOR ALGEBRA MATERIAL ON STUDENT'S MATHEMATICAL CONCEPT UNDERSTANDING ABILITY

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ABSTRACT
This research is motivated by the difficulties experienced by students in understanding mathematical concepts in algebra materials, lack of student interest in learning, and limited use of learning resources. To overcome this, the researcher provide to develop interactive learning media using the Lumio platform in algebra materials to help students' ability to understand mathematical concepts. The results of the development measured are in the form of validity and practicality. Type of this study is Research and Development (R&D) by carrying out the development stages of ADDIE, namely analysis, design, development, implementation, and evaluation. The sample of this study is 7th grade students in one of the junior high schools in Serang City. The research instruments used included teacher interview sheets, expert validation questionnaires, and response questionnaires. The data analysis techniques used are qualitative descriptive and quantitative descriptive. This research produced a product in the form of interactive learning media using the Lumio platform on algebraic material. The results of the validation of interactive learning media earned a percentage of 89% from material experts, 89% from education experts, and 86% from media experts. The results of the response of teacher and students to interactive learning media earned a percentage of 85% from teacher and 74% from students. Thus, this study shows that the development of interactive learning media using the Lumio platform is declared valid and practical to be used in helping students' ability to understand mathematical concepts, especially in algebra materials.
Keywords: Algebra material; interactive learning media; lumio platform; mathematical concept understanding ability.

ABSTRAK
Penelitian ini dilatarbelakangi oleh adanya kesulitan yang dialami siswa dalam memahami konsep matematis pada materi aljabar, minat belajar siswa yang kurang, serta penggunaan sumber belajar yang terbatas. Untuk mengatasi hal tersebut, peneliti bertujuan ingin mengembangkan media pembelajaran interaktif menggunakan platform Lumio pada materi aljabar untuk membantu kemampuan pemahaman konsep matematis siswa. Hasil pengembangan yang diukur berupa kevalidan dan kepraktisan. Jenis penelitian ini adalah Research and Development (R&D) dengan melakukan tahapan pengembangan dari ADDIE, yaitu analysis, design, development, implementation, dan evaluation. Sampel penelitian ini adalah siswa kelas 7 di salah satu sekolah menengah pertama di Kota Serang. Instrumen penelitian yang digunakan meliputi lembar wawancara guru, angket validasi ahli, dan angket respon. Teknik analisis data yang digunakan adalah deskriptif kualitatif dan deskriptif kuantitatif. Penelitian ini menghasilkan sebuah produk berupa media pembelajaran interaktif menggunakan platform Lumio pada materi aljabar. Hasil validasi media pembelajaran interaktif memperoleh persentase 89% dari ahli materi, 89% dari ahli pendidikan, dan 86% dari ahli media. Hasil respon guru dan siswa terhadap media pembelajaran interaktif memperoleh persentase 85% dari guru dan 74% dari siswa. Dengan demikian, penelitian ini menunjukkan bahwa pengembangan media

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pembelajaran interaktif menggunakan platform Lumio dinyatakan valid dan praktis untuk digunakan dalam membantu kemampuan pemahaman konsep matematis siswa, khususnya pada materi aljabar.
***Kata kunci**: Kemampuan pemahaman konsep matematis; materi aljabar; media pembelajaran interaktif; platform lumio.*

Introduction

Education is a program created to develop the potential and skills of each individual in dealing with real-life problems. In the field of education, one of the basic skills that is very important to pay attention to is the understanding of concepts because these skills are the foundation for other abilities such as critical thinking and so on. The ability to understand concepts not only encourages students to simply memorize a concept, but students must be able to connect various ideas related to a concept and then be able to convey the concept in their own language (Kilpatrick, Swafford, & Findell, 2001). According to Lichtenberger, Hofer, Stern, & Vaterlaus (2025), the ability to understand concepts of students who are trained in depth can make it easier for students to apply formulas into the form of knowledge. Therefore, understanding concepts is a basic skill that needs to be studied further and used as the main focus in education.

The success of education in achieving a goal will be influenced by the learning strategies used in providing the best learning experience (Permendikbudristek No 16 Tahun 2022). The learning experience is carried out to encourage student activity and interaction which can be done through the available resources, as well as information and communication technology. In addition, another supporting component to provide a good learning experience is by using learning media (Putri & Yefterson, 2022). Therefore, a quality learning experience can be done by choosing and using learning media by utilizing technology so that it can help to achieve its goals in the learning process.

Learning media is a learning tool that can be used to create a fun learning atmosphere (Putra, Sudiana, & Pamungkas, 2020). In addition, learning media can be used as a means to convey messages or information from learning sources to students. Through learning media, students can explore information and make it into new knowledge (Zahwa & Syafi'i, 2022). Therefore, students' understanding of the material presented will be helped by the presence of learning media.

The use of technology in the world of education continues to grow from time to time. The use of technology in the field of education can be done by applying learning media using computer-assisted learning in teaching and learning activities (Welda, Kusuma, Dirgayusari, Putra, & Indrawan, 2023). The use of computer-based technology in learning activities can stimulate all students' senses to obtain information and knowledge in a comprehensive manner (Arifin, Yuhana, Fathurrohman, & Muhyidin, 2023). One of the uses of technology and computers in the the field of education is the use of interactive learning media.

In every level of education, mathematics is one of the subjects that is important for students to learn. However, the results of PISA in 2022 show that the results of students' mathematical ability tests in many countries are still less than the average score of the OECD (Organization for Economic Co-operation and Development), one

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of the countries included is Indonesia (İdil, Gülen, & Dönmez, 2024). Mathematics is a subject that is often considered difficult to understand by most students so that students feel less motivated to learn it. One of the materials that is considered difficult by most students in mathematics learning is algebraic material because the topic is abstract (Fadilah & Effendi, 2023; Sakiah & Effendi, 2021). The use of learning media can be used as a solution to help and facilitate students in understanding abstract material, such as algebraic material, clearly and clearly (Prayitno, Taufik, & Muawanah, 2022; Sitompul, Tambunan, & Purba, 2022). Therefore, there is a need for learning media that can attract and increase students' motivation to mathematics learning, especially in algebra materials.

Based on the result of interview with 7th grade math teacher, there are still students who have difficulty in applying the concepts of the material that have been understood to solve a mathematics problem. This is due to the lack of student learning independence, where students are less motivated to take the initiative to repeat the material that has been learned independently. In classroom, the learning resources used are only in the form of LKS books, so teacher have never used any aids or media in classroom learning activities. Teacher feel that the process of making learning media requires careful preparation and a long time. Therefore, there needs to be a learning platform that facilitates the process of creating interesting and interactive learning media to help students understand mathematical concepts well. Students experience problems in their ability to count, determine and state the objects needed and some students feel inferior, especially when they hear that they have to do mathematical calculation problems (Khoirudin, Vahlia & ES., 2024). Skillful understanding of mathematical concepts can be useful for students to learn the material later. If students do not understand the material concepts well, then students will experience various obstacles when they want to apply the concept to solve a mathematical problem (Nduru, 2024). Similarly, in the context of algebraic material, students need to understand the basic material concepts first before learning the next material. Therefore, the ability to understand mathematical concepts needs to be mastered well by students.

Understanding of mathematical concepts can be developed by doing structured practices or exercises. This is because the lack of practice in learning mathematics can affect the involvement and understanding of concepts in students (Apriani & Sudiansyah, 2024). These practice activities can be maximized by utilizing technology such as software, which allows students to practice and gain real-world feedback. One of the software that can be used to train students' mathematical skills is the Lumio platform, where the platform provides interesting features for creating learning media, such as adding text, image, audio, animation, video, and interactive quiz (Janah, Surani, & Fricticarani, 2023).

Previous research has shown that the use of interactive learning media can train and enhance students' ability to understanding mathematical concept (Amalia, Alamsyah, & Pamungkas, 2022; Lestari, Senjaya, & Ismunandar, 2019). Another study shows that the use of the Lumio platform in developing interactive learning media is declared feasible for use and can help facilitate the learning activities (Arzfi, Montessori, & Rusdinal, 2025; Sari, Rosita, & Subastian, 2025). Although several studies have proven that the use of interactive learning media can have a positive effect on students' activeness and understanding of mathematical concepts, not

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much has focused on the Lumio platform, which is able to integrate multimedia and various types of formative assessments. In addition, there has been no research that specifically discusses the understanding of mathematical concepts in algebra materials at the junior high school level through interactive learning media using the Lumio platform.

Based on the identification of the problems presented, the purpose of this study is to develop an interactive learning media using the Lumio platform for algebra material on students' mathematical concept understanding ability, where the media is expected to be declared valid or feasible to use and practical through product validity test and product practicality test.

Research Methods

This study is a Research and Development (R&D), which uses the stages of the ADDIE model as illustrated in Figure 1 (Sugiyono, 2022).

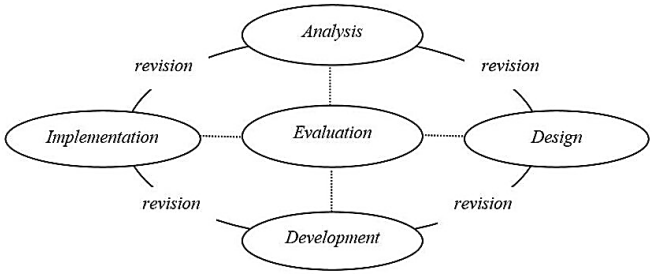

Figure 1. ADDIE Model Stages

Based on Figure 1, there are five stages in the ADDIE model, namely analysis, design, development, implementation, and evaluation. The analysis stage consist of analysis of student needs, curriculum, and characteristics so that this stage is carried out to find out information about the products needed by teacher and students in the mathematics learning process. The design stage is the activity of designing products according to the needs of teacher and students, that is preparing materials, determining learning experiences, making flowchart as a guide for devoloping the interactive learning media, and compiling research instruments. The development stage is an activity consisting of three parts, namely product development, product validation, and product revision. The implementation stage is the activity of implementing products that have been declared suitable for use to help students' ability to understand mathematical concepts. Additionally, the evaluation stage is to evaluate the suitability between the results of each stage and the specifications that have been determined.

There are two subjects used in this study, namely development subjects and trial subjects. The development subject consists of material experts, education experts, and media experts to validate the products that have been developed. The trial subject consisted of teacher and 7th grade students in one of the junior high schools in Serang City. There were 27 students in 7th grade who were used as trial subjects. Tests conducted in this study are validity tests and practicality test.

In this research, the data collection techniques used is interview, questionnaires and documentation. To collect research data, the researcher used research instruments such as teacher interview sheets, product validation questionnaires, and response questionnaires. Furthermore, the data obtained will be analyzed using qualitative methods and descriptive statistics. The qualitative

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method is used to analyze qualitative data, where the qualitative data earned in this study are the result of interview with mathematics teacher. Descriptive statistics are used to analyze quantitative data, where the quantitative data earned in this study are the results of product validation questionnaires and response questionnaires.

Analysis of Product Validation Questionnaire Results

There are three product validation questionnaire instruments used in the research, namely the material expert validation questionnaire, the education expert validation questionnaire, and the media expert validation questionnaire. The results of the product validation questionnaire will obtain quantitative data so that the data analysis is carried out using descriptive statistics. The number of scores obtained from each expert will be converted into a percentage using the following formula (Jubaerudin, Supratman, & Santika, 2021).

$$P = \frac{total\ score}{maximum\ score} \times 100\%$$

Furthermore, the percentage results are categorized based on the product validity criteria (Arikunto & Jabar, 2009) presented in Table 1.

Table 1. Product Validity Criteria.

Interval	Criterion
0% - 20%	Invalid
21% - 40%	Less Valid
41% - 60%	Quite Valid
61% - 80%	Valid
81% - 100%	Highly Valid

Analysis of Response Questionnaire Results

There are two response questionnaire instruments used in the research, namely the teacher response questionnaire and the student response questionnaire. The results of the repon questionnaire will obtain quantitative data so that the data analysis is carried out using descriptive statistics. The total score obtained from teacher and students will be converted into a percentage using the following formula (Jubaerudin et al., 2021).

$$P = \frac{total\ score}{maximum\ score} \times 100\%$$

Furthermore, the percentage results are categorized based on the product practicality criteria displayed in Table 2.

Table 2. Product Practicality Criteria.

Interval	Criterion
0% - 20%	Impractical
21% - 40%	Less Practical
41% - 60%	Quite Practical
61% - 80%	Practical
81% - 100%	Very Practical

Results and Discussion

This research and development produces interactive learning media developed using the Lumio platform, where the media has been implemented in 7th grade in one of the junior high schools in Serang City. In developing this media, the

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researcher went through five stages of the ADDIE model, namely analysis, design, development, implementation, and evaluation. The contribution of this research is to introduce the use of the Lumio platform as a learning innovation in developing interactive learning media to help students' ability to understand mathematical concepts in algebra materials, where there has been no previous research that discusses this matter. The following are the results of research that have been found based on the stages of development that have been passed:

Analysis Stage

Based on the result of interview with 7th grade math teacher at school, the learning resources used in mathematics learning are only in the form of LKS books provided by the school. In addition, teacher have never used any learning media in the learning process in 7th grade so it is not enough to support students' understanding of mathematical concepts. Based on multimedia learning theory, the delivery of learning materials is more effective through a combination of text and image elements because this can reduce the cognitive load, which is the amount of information processed by the brain at the same time (Mayer, 2014). Therefore, teacher need new learning resources that can help in conveying information or subject matter to students.

One of the math materials that has been studied by 7th grade students in the first semester is algebra material. However, the material is still a challenge for students because the concept of the material is abstract and involves many symbols. According to the theory of conceptual change by Postner, conceptual change from old ideas to new ideas can occur if they are able to meet four conditions, namely dissatisfaction with the old idea, and the new idea to be accepted must be intelligible, pausible, and fruitful (Dahar, 2011). Therefore, every learning requires the right strategy in clarifying abstract material concepts so that conceptual changes in the student can occur.

According to Mathaba, Bayaga, Tîrnovan, & Bossé (2024), a good understanding of the rules for writing mathematical symbols and algebraic concepts can help a person in solving various problems regarding algebra. Based on the result of interview with 7th grade math teacher at school, students still have difficulty solve problems about algebra, where they have learned algebraic material in the previous semester. This can be caused by internal and external factors (Sugiarni, Septian, Juandi, & Julaeha, 2021). Internal factors can arise from within the student himself, such as his lack of learning independence and their learning motivation, while external factors can arise from outside the student such as the delivery and presentation of learning materials that are less interesting and less varied so that students are less interested in the material being delivered.

Lumio by SMART is one of the platforms that can be used as a tool or learning medium in delivering material so that it can provide students with a better understanding of the concepts of the material being conveyed (Osipova & Bagrova, 2022). The Lumio platform is equipped with features that can help to create engaging and interactive learning (Kaltsum et al., 2024). In addition, the Lumio platform can be accessed over the internet using a computer or smartphone so that it is easy to use anywhere and anytime without having to go through any download process. Therefore, the researcher chose to develop interactive learning media using

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the Lumio platform to support students' ability to understand mathematical concepts in algebraic material.

Design Stage

After conducting the analysis stage, the researcher then designed the product based on needs, curriculum, and characteristics of 7th grade students at school. The preparation of the material is carried out by adjusting to the learning objectives to be attained which refer to the curriculum that applies at school, as well as adjusting to the indicators of students' understanding of mathematical concepts. The topic or material developed is algebraic material that focuses on three subsubjects, namely algebraic elements and forms, algebraic properties and operations, and modeling with algebraic forms. Materials will be curated using the help of the Canva platform to support engaging visualisation. Through an attractive visual approach, an interactive learning medium can help students in understanding abstract material concepts such as algebraic material (Dosinaeng et al., 2025). The design results that have been created on the Canva platform are then integrated into the Lumio platform to add interactive activities by utilizing the features available on the Lumio platform.

The Lumio platform makes it possible to realize an interactive learning experience in learning activities (Fontes, Sanam, Putri, Murwanti, & Larasati, 2024). The learning experience includes game-based learning activities, brainstorming, listening to learning videos, manipulation or simulation activities, practice questions or evaluations, and learning reflection. Games are one of the factors that enable students to understand concepts in a fun way (Sudarman & Vahlia, 2016). After determining the learning experience, the researcher created a flowchart to be used as a guide in developing interactive learning media using the Lumio platform presented in Figure 2.

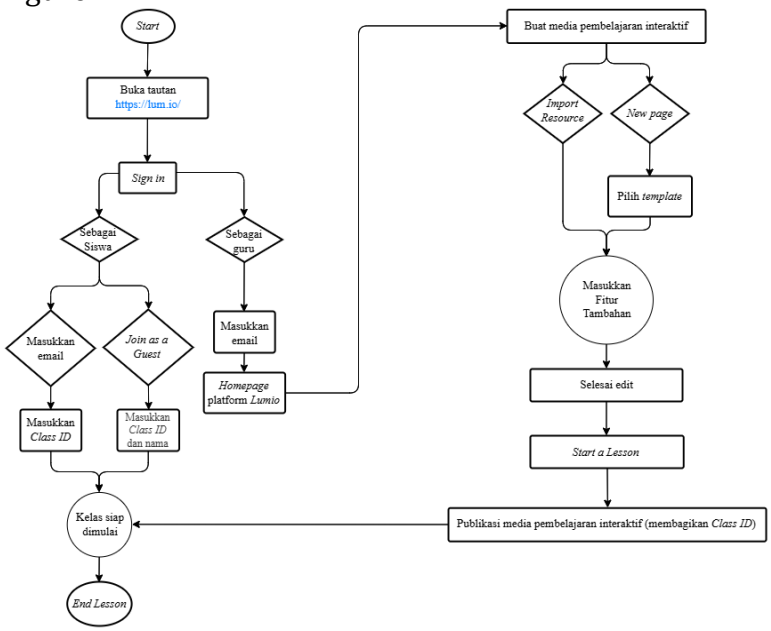

Figure 2. Flowchart

Based on Figure 2, an interactive learning experience can be created by adding additional features using the Lumio platform to the material slides that have been created. The slides in question are learning materials that have been compiled and

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created with the help of the Canva platform, and then uploaded the file to the Lumio platform. That way, the material slides become more interactive and interesting to use in mathematics learning.

Furthermore, the researcher also compiles the research instruments needed to obtain an assessment in testing the validity and practicality of the product. The instruments prepared included a validation questionnaire given to two material experts, two education experts, and two media experts, as well as response questionnaires given to teacher and student.

Development Stage

The development in this study, interactive learning media is created and developed using the Lumio platform. However, previously, researchers compiled learning materials first using the Canva platform to create a more attractive visual appearance. The designed material is then stored in the form of .pdf files, then transferred to the Lumio platform to be developed to be more interactive. The resulting products at the development stage are presented in Figure 3-8.

Figure 3. Initial or Introduction

Based on Figure 3, the preliminary view of the resulting product consists of a cover, instructions for use, learning objectives, learning benefits, and a concept map of the algebra material to be studied in this interactive learning medium.

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Figure 4. Learning Activity Display

Based on Figure 4, the display of learning activities on the resulting product consists of learning materials, learning videos from YouTube, brainstorming activities, simulation activities, games, and practice questions. Some pages are equipped with instructional audio features that function to provide explanations or additional information in the form of voice related to instructions for the implementation of learning activities displayed on the page. The display of the instructional audio feature can be seen in Figure 5.

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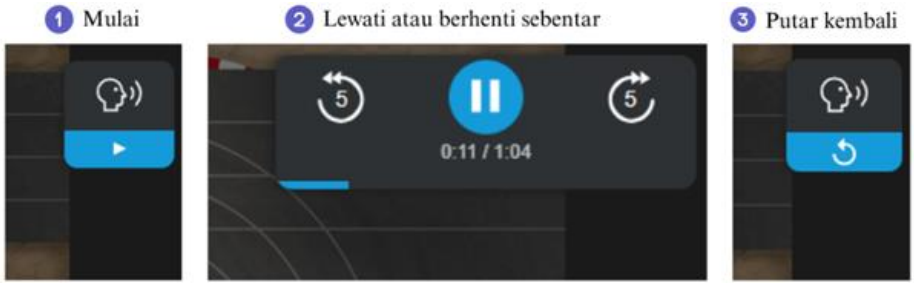

Figure 5. Instructional Audio Feature Display

Based on Figure 5, the interactive learning media that has been created is equipped with an instructional audio feature that is useful to help provide additional explanations in the form of sound, where this feature is found in every learning activity that requires instructions for the use of the activity to be clearer.

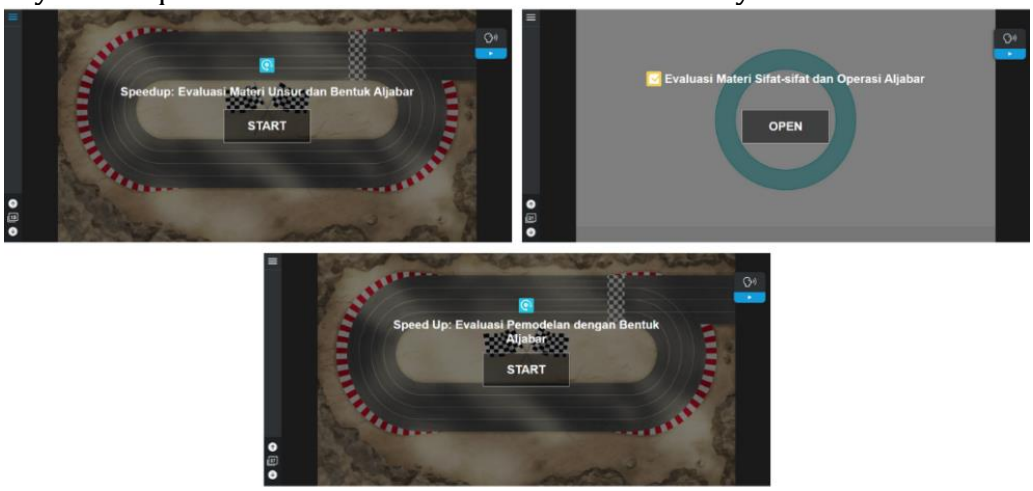

Figure 6. Learning Evaluation View

Based on Figure 6, the learning evaluation display is presented on each subsubject, where the submaterial presented in this media consists of three, namely algebraic elements and forms, algebraic properties and operations, and modeling with algebraic forms. The evaluation questions displayed are multiple-choice, and true/false.

Figure 7. Learning Reflection Display

The display of learning reflections presented in Figure 7, is at the end of the page after students complete all series of learning activities. The reflection activity consisted of six questions to obtain students' opinions about learning activities that had been carried out using interactive learning media developed.

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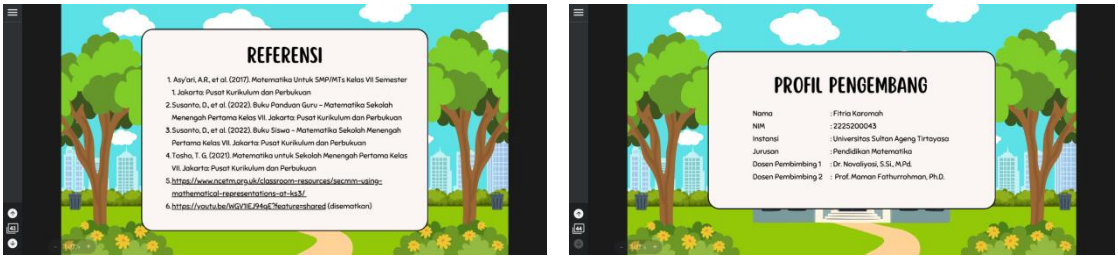

Figure 8. Closing Display

Based on Figure 8, the closing display of the resulting product is a reference or reference list used in developing interactive learning media and developer profiles.

After completing developing interactive learning media using the Lumio platform on algebra materials, then validate the product using a questionnaire. This validation activity was carried out by two material experts, two education experts, and two media experts. The product validation activity aims to determine the validity of the developed product, as well as to obtain criticism and suggestions to be used as consideration in product revision so that interactive learning media using the Lumio platform can be declared feasible and can be used for product trials.

Validation of material experts is carried out to review the validity of the developed product from three aspects, namely the curriculum aspect, the material aspect, and the evaluation aspect. The results of the validation of the material experts as can be seensubj in Table 3.

Table 3. Material Expert Validation Results

No.	Aspects	Total Score	Maximum Score	Percentage
1.	Curriculum	19	20	95%
2.	Material	79	90	88%
3.	Evaluation	18	20	90%
	Final Percentage		89%	

Based on Table 3, the final percentage of assessments from material experts obtained 89% with the category "Very Valid". The suggestions for improvement from the two validators came to different conclusions. The first validator stated that the interactive learning media developed was declared appropriate for use without revision because the product made was in line with the learning objectives and student conditions, but the content of algebraic material could be developed more widely in the next research by adjusting the learning outcomes in phase D. However, the second validator stated that the interactive learning media developed was declared appropriate for use with revision because there were still several Errors in the writing of symbols and there is a lack of clear image presentation. The results of product repair or revision based on the advice of the material expert can be seen in Table 4.

Table 4. Product Revision Results Based on Suggestions from Material Experts

Improvement Suggestions from Material Experts	
Before Revision	**After Revision**
Presentation of unclear images in the evaluation question of submaterial elements and algebraic forms in number 3.	

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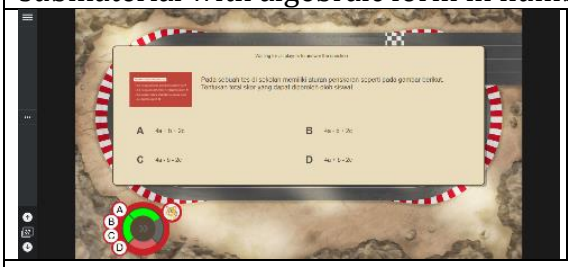
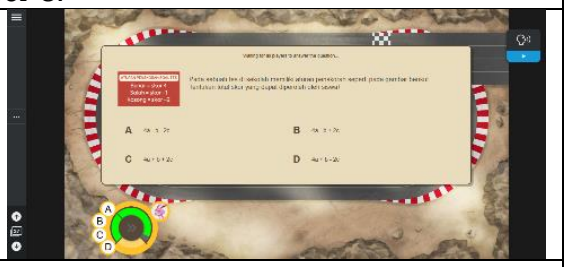
Presentation of unclear images in the evaluation question of modeling submaterial with algebraic form in number 8.

Errors in the writing of symbols on the presented image.

Based on Table 4, there are suggestions for improvement from material experts, namely regarding the unclarity of some of the images presented in learning evaluation activities in interactive learning media, as well as errors in writing roman numerals on one of the pages. Furthermore, the validation of education experts is carried out to review the validity of the developed product from three aspects, namely the presentation aspect, the content aspect, and the language aspect. The results of the validation of education experts are presented in Table 5.

Table 5. Validation Results of Education Experts

No.	Aspects	Total Score	Maximum Score	Percentage
1.	Precentation	37	40	93
2.	Content	44	50	88
3.	Language	43	50	86
	Final Percentage		89%	

Based on Table 5, the final percentage results obtained from the assessment by education experts reached 89% with the category "Very Valid". However, there are suggestions for improvement from one of the validators so that the interactive learning media developed was declared appropriate for use. The suggestion for improvement is that there is a discrepancy in the answer key in some of the evaluation questions presented. The results of product improvement or revision based on advice from education experts is shown in Table 6.

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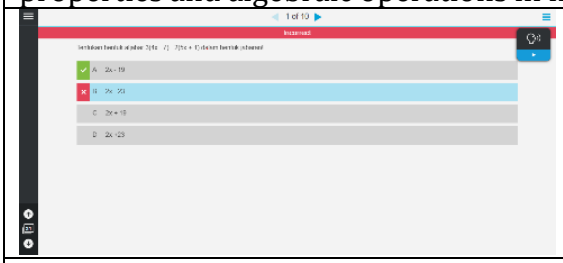
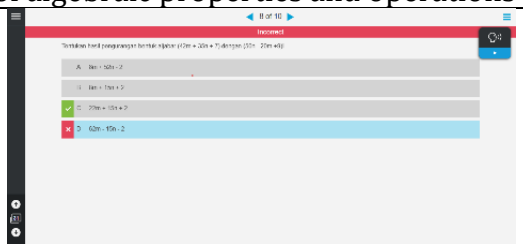
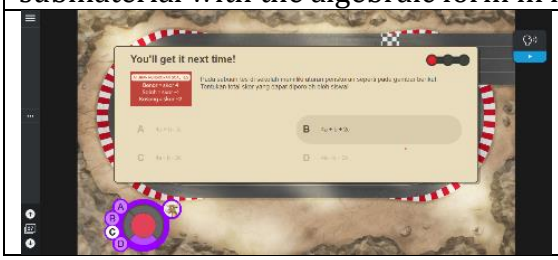
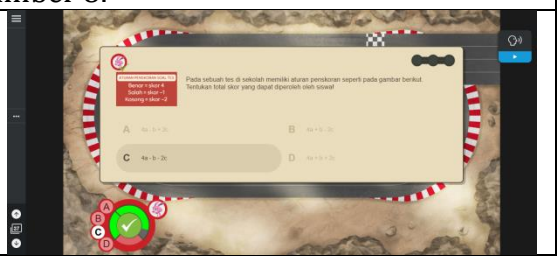
Table 6. Product Revision Results Based on Suggestions from Education Experts

Improvement Suggestions from Education Experts	
Before Revision	**After Revision**
Disagreement of the answer key in the evaluation question of the submaterial of properties and algebraic operations in number 1.	
	
The inconsistency of the answer key in the evaluation question of the submaterial of algebraic properties and operations in number 8.	
	
Inconsistency of the answer key in the evaluation question of the modeling submaterial with the algebraic form in number 8.	
	

Based on Table 6, education experts provide suggestion for improvement related to the interactive learning media that have been created, namely correcting some answer key errors in the questions presented in the learning evaluation activity. Finally, the validation of media experts is carried out to review the validity of the developed product from two aspects, namely the display aspect and the programming aspect. The results of the validation of media experts are displayed in Table 7.

Table 7. Media Expert Validation Results

No.	Aspects	Total Score	Mazimum Score	Percentage
1.	Display	116	140	83%
2.	Programming	64	70	91%
Final Percentage			86%	

Based on Table 7, the results of the final assessment obtained from media experts on the validation of interactive learning media that have been made obtained the category of "Very Valid" with a percentage obtained reaching 86%. The interactive learning media was declared suitable for use without revision from

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media experts because the interactive learning media made had a fairly good appearance and varied assessment types.

Based on validated and revised product results, interactive learning media using the Lumio platform on algebra materials was declared feasible for use in mathematics learning. This is in line with research conducted by Purnama, Faslah, & Adha (2024), which states that interactive learning media using the Lumio platform is declared valid and feasible to be used for learning activities in terms of use, functionality, and visual communication. This is because interactive learning media using the Lumio platform provides features that allow students to interact with learning content directly. The features in question are Game-Based Activities, Shout it Out!, Manipulative, Response, and so on.

In addition, the Lumio platform is superior compared to other platforms for developing an interactive learning media. The Lumio platform does not require a download process when accessing products developed like other platforms, such as Appie Pie, Ispring Suite, Smart Apps Creator, which have been used in previous research to develop an interactive learning media. Interactive learning media developed using the Lumio platform can be accessed through a special link or barcode so that it can be used anywhere and anytime. Therefore, the Lumio platform can be used as a more efficient learning alternative compared to other platforms.

Implementation Stage

Interactive learning media using the Lumio platform that has been declared valid and feasible can then be implemented in real learning activities. The product trial at this stage was carried out to one 7th grade mathematics teacher and 27 students in 7th grade at school. Product trials were carried out during three meetings. Teacher and students are given a response questionnaire to give an assessment of the practicality of the product developed after using the product. The response questionnaire consists of 15 statements consisting of four aspects of assessment, namely the display aspect, user convenience aspect, material presentation aspect, and benefit aspect. The results of teacher's response to interactive learning media using the Lumio platform are shown in Table 8.

Table 8. Teacher's Response Results

No.	Aspects	Total Score	Maximum Score	Percentage
1.	Display	17	20	85%
2.	User Convenience	13	15	87%
3.	Material Percentation	17	20	85%
4.	Benefit	17	20	85%
Final Percentage			85%	

Based on Table 8, the results of teacher's response to the developed product are 85% in the category of "Very Practical". Based on this, teacher consider interactive learning media to have an attractive appearance, are quite easy to use, the presentation of the material is comprehensible, and can be used in mathematics learning, especially to learn the concept of algebraic material in 7th grade. In addition, the results of students' responses to interactive learning media using the Lumio platform are shown in Table 9.

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Table 9. Student Response Results

No.	Aspects	Total Score	Maximum Score	Percentage
1.	Display	450	540	76%
2.	User Convenience	297	405	73%
3.	Material Percentation	383	540	71%
4.	Benefit	385	540	71%
Final Percentage			74%	

Based on Table 9, The results of student responses presented in the table above show that the final percentage obtained was 74% with the category "Practical". Based on this, most students agree that interactive learning media using the Lumio platform has an attractive appearance, is easy to use, the material presented is easy to understand, and can be used in learning activities because it can foster the spirit of learning and can support students' understanding of mathematical concepts. This is in line with research conducted by Wulandari (2020), the use of interactive learning media that has an attractive appearance can arouse motivation and interest in learning mathematics in students and can make it easier for students to process the information presented in the media. Hasil kepraktisan ini menunjukkan bahwa media pembelajaran interaktif menggunakan platform Lumio dapat mendorong kemandirian dan keterlibatan diri pada siswa dalam proses belajarnya, yang dimana hal ini sejalan dengan prinsip pembelajaran kontruktivisme (Dahar, 2011).

Thus, interactive learning media using the Lumio platform is considered practical or easy to use to support students' ability to understand mathematical concepts in algebra materials.

Evaluation Stage

The evaluation stage is the stage at the end of each stage of ADDIE to see the success of the product developed. Based on the research and development that has been carried out using the ADDIE model, interactive learning media using the Lumio platform on algebraic material on students' ability to understand mathematical concepts has succeeded in obtaining validity and practicality criteria. Therefore, it can be said that the product developed in research and development has met the evaluation principles in the ADDIE model (Sugiyono, 2022). There may be development suggestions for future researchers, namely conducting effectiveness tests to see the influence or significant improvement related to the ability to understanding mathematical concept or another mathematical abilities.

Experts or validators in this study consider that this media is suitable for mathematics learning because the material developed is in accordance with the goals to be achieved in mathematics learning, especially in algebraic materials, the language used is quite clear and easy to understand, and has an attractive appearance and features and can support interactive learning activities. In addition, teacher and most students feel satisfied after using this media that has been developed because the appearance is quite interesting and interactive, and can help students' understanding of mathematical concepts in algebra material.

The advantages of the results of this study are compared to previous research that is relevant to this study. This study reviews the feasibility of the products

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developed not only based on assessments by material experts and media experts, but also based on assessments conducted by education experts as well, where these education experts assess the media in terms of its presentation techniques, learning strategies formed in encouraging students' activeness and understanding of concepts, and the language used in conveying information in this media. However, the results of this study also have shortcomings, namely the algebra material developed in this medium is limited to only three sub-subjects, namely algebra elements and forms, algebra properties and operations, and modeling with algebra forms. In addition, the product trials that have been carried out only last for three meetings so that the material presented in this media has not been delivered completely and optimally.

Another obstacles experienced by researchers during this research and development is the limited number of computer device units, and often some computer devices experience a long loading process. Therefore, the use of this interactive learning media is better to use stable internet access so as not to hinder learning activities using this media.

Conclusion and Suggestion

Based on the results of the product validity that has been carried out, it shows that the interactive learning media that has been developed using the Lumio platform has has achieved good validity criteria reviewed from the analysis of the results of the validation questionnaire by material experts, education experts, and media experts, so that it is usable for mathematics learning activities, especially in algebraic material. In addition, the interactive learning media developed also achieved good practicality criteria based on analysis of response questionnaire by teacher and students. Therefore, interactive learning media using the Lumio platform on students' ability to understand mathematical concepts is declared valid and practical.

As for the suggestions for further research, it is necessary to carry out wider development on other materials both in the field of mathematics and in other fields of study. In addition, further research is expected to test the effectiveness of interactive learning media using the Lumio platform in improving students' ability to understand mathematical concepts, or to improve other mathematical skills.

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