DEVELOPMENT OF ONLINE BUSINESS MATERIALS FOR SCRATCH-BASED LEARNING IN VOCATIONAL SCHOOLS

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ABSTRACT

This study aims to analyze the development of Scratch-based learning media in online business subjects in class XI Retail Business (BRI) 2 SMK Tamansiswa 1 Jakarta and analyze the validity of the Scratch-based learning media that has been developed. The research method used by the researcher is Research and Development (R&D) only up to Level 3, at this level the researcher develops existing products, research and development at level 3 is the researcher tests the product in order to develop existing products. The development model used is ADDIE which is modified according to the needs of the researcher into Analysis, Design, Development, and Implementation. The results of the media expert validation analysis obtained a percentage of 72% included in the valid category. Further validation by material experts produced a score of 60% which fell into the fairly valid validity category. The results of the questionnaire assessment given to educators showed a level of achievement reaching 78% which fell into the valid category. Based on the validity results obtained, the Scratch-based online business material learning media is included in the valid category and is suitable for use as a learning medium in the student learning process.
Keyword: Research and Development, ADDIE model, Learning materials, Scratch

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengembangan media pembelajaran berbasis *Scratch* dalam mata pelajaran bisnis online pada kelas XI Bisnis Ritel (BRI) 2 SMK Tamansiswa 1 Jakarta dan menganalisis validitas media pembelajaran berbasis *Scratch* yang telah dikembangkan. Metode penelitian yang digunakan oleh peneliti adalah *Research and Development* (R&D) hanya sampai Level 3, level ini peneliti melakukan pengembangan pada produk yang telah ada, penelitian dan pengembangan pada level 3 adalah peneliti menguji produk dalam rangka mengembangkan produk yang telah ada. Model pengembangan yang digunakan adalah ADDIE yang dimodifikasi sesuai kebutuhan peneliti menjadi *Analysis, Design, Development, dan Implementation*. Hasil analisis validasi ahli media diperoleh persentase sebesar 72% termasuk dalam kategori valid. Validasi selanjutnya oleh ahli materi menghasilkan skor 60% yang masuk dalam kategori validitas cukup valid. Hasil dari penilaian angket yang diberikan kepada pendidik menunjukkan tingkat pencapaian mencapai persentase 78% yang termasuk kedalam kategori valid. Berdasarkan hasil validitas yang diperoleh, media pembelajaran materi bisnis online berbasis Scratch termasuk dalam kategori valid dan layak digunakan sebagai media pembelajaran dalam proses pembelajaran siswa.
Kata kunci: Penelitian dan Pengembangan, ADDIE model, Media pembelajaran, *Scratch*

INTRODUCTION

Using educational media Students can engage with learning materials through the use of Scratch. Presently, nevertheless, a few students are having trouble following the terminology when discussing the online business course materials in class. Learning media must be created with Scratch in order to boost student engagement with the curriculum. With the advent of Scratch learning media, educators may now offer lessons as real-world projects with applications. Concepts in online business courses can be visually and interactively taught through the use of Scratch learning materials. Instead of relying solely on text reading or spoken explanations, this enables students to grasp those concepts more fully through exploration and hands-on experience. The location of the research problem is made easier to understand by determining the research site. The study was conducted at SMK Tamansiswa 1 Jakarta, Jalan Garuda No.25, RT.7 RW.4 Gunung Sahari Selelatan, Kemayoran District, Central Jakarta City, Special Capital Region of Jakarta.

The journal "Development of Scratch-Based Learning Media on the Subject of Optical Devices" published a study by (Akhlis et al., 2019). The purpose of this research is to create learning materials on optical equipment using Scratch and assess their viability. Thiagarajan claims that the 4D development paradigm is used in the process of teaching media development. Tests of the suitability of scratch-based learning media are the focus of this research. The questionnaire used in the feasibility test process includes questions about aspects of software engineering, aspects of material substance, aspects of visual communication design, questions for teacher evaluation of the quality of learning media, and questions about student responses. Respondents to the questionnaire comprised of physics teachers, high school students enrolled in MIPA class XI, and lecturers with extensive experience in each area. Descriptive statistical analysis is used to examine the feasibility data, and the learning media eligibility criteria are used to characterize the average statistical value. The visual communication design aspect of the learning media feasibility test came in at 94% with a very feasible category, the software engineering aspect at 83% with a very feasible category, the material substance aspect at 70% with a feasible category, the learning media quality test at 91% with a very feasible category, and the student response percentage at 79.84% in the appropriate category were the results of the practicality test. The results of the data analysis indicate that optical instruments-related Scratch-based learning materials are appropriate for use as physics teaching resources in classroom settings.

The article "Development of Interactive Multimedia Based Learning Media Using Scratch with Computational Thinking Methods on Trigonometry Material in Class X of SMA Negeri 7 Mandau" states (Aulia, 2021). The purpose of this project is to investigate the methods and outcomes of creating interactive, multimedia-based learning resources on trigonometry using Scratch and computational thinking techniques. In 2020–2021, during the academic year, the research was carried out at SMA Negeri 7 Mandau, situated in Tantani Village, Mandau District, Bengkalis Regency. The ADDIE model is the development model used in this study. adjusted to meet the demands of the researcher for 1) Analysis, 2) Design, and 3) Development. An observational and interview-based non-testing method was employed to acquire the data. Validation sheets in the form of questionnaires were utilized as the data gathering tool. The validation results were subjected to a descriptive analysis using both quantitative and qualitative methods. Four validators conducted a research validation examination, yielding an average validation of 83.53% for learning media, which is considered quite valid. The study's result demonstrates that interactive multimedia-based learning materials have been created from scratch utilizing the technically sound computational thinking method.

(Ma'rifah et al., 2023) in the article "Development of Interactive Multimedia-Based Physics Learning Media Using Scratch to Improve Student Learning Outcomes" Based on the validation findings from two knowledgeable validators, this research concludes that the

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learning medium generated satisfies the validity standards and is appropriate for use in instruction. It received an overall score of 3.67, falling into the very good category. The media developed meets practicality by testing students' responses to the use of interactive multimedia-based learning media using scratch, receiving a score of 87.1% with the predicate "very good". Meanwhile, data from observations of learning implementation obtained a score of 96%, indicating the predicate "reliable" so that it meets practical criteria. The media developed meets the criteria for being effective in improving student learning outcomes, as shown by the normalized pre-test and post-test gain of 0.64, which is in the medium category.

As stated in the Journal "Comparison of the Use of Scratch and Macromedia Flash 8 Applications on Interest in Learning in 2D Animation Subjects, Multimedia Department at SMK Negeri 1 Mesjid Raya" (Satriana, 2019). In order to improve student learning outcomes, this project intends to produce interactive multimedia-based learning materials employing reliable, useful, and efficient scratch techniques. This kind of research is called research and development (R&D), and it follows the five research processes of analysis, design, development, implementation, and evaluation found in the ADDIE development model. Validation sheets, student response surveys, test procedures, and observation techniques are some of the data collection techniques used. The study's findings demonstrate that interactive multimedia-based learning materials have been created, placing them in the very good category. Specifically, an evaluation was conducted on the media component, stating at a valid level, and the material aspect, obtaining a percentage of 91.74%. valid, and observers scored 93.3% in the reliable category for practicality based on data from the student response questionnaire, which placed it in the good area with a percentage of 87.1%. The averaged pre-test and post-test gain of 0.64, falling into the medium range, indicates that the media produced satisfies the requirements for being successful in enhancing student learning outcomes. The interactive multimedia-based learning resources created using Scratch can therefore be considered usable.

The journal "Meta-Analysis of Scratch Media on High School Students' Computational Thinking Skills in Physics Learning" (Widiningrum et al., 2021) states. Abstract physics is a tough subject for students to acquire via distance learning, hence engaging media is necessary. One medium that helps with the application of this knowledge is Scratch. The purpose of this study is to ascertain the benefits and drawbacks of employing scratch learning medium in high school physics, as well as computational thinking abilities. A systematic literature review combined with qualitative descriptive analysis is the methodology employed. Students' computational thinking skills can be enhanced by Scratch because it fosters creativity through the creation of animations and simulations, fosters systematic, collaborative thinking, and allows users to implement algorithms. These features enable users to apply logical thinking patterns that can complicate simple concepts in physics lessons.

Researchers have learned that the Merdeka Curriculum has been applied at SMK Tamansiswa 1 Jakarta based on interviews conducted there on May 17 and 21, 2024. Teachers have also used educational resources like Quizizz, Google Classroom, and PowerPoint in their lesson plans. Presenting and having discussions are the ways that educators utilize to provide online business material. While combining these two approaches is beneficial, each approach has drawbacks of its own. Similar to the percentage approach, a number of students could not comprehend the explanation provided by the presenters as they concluded their presentations. Similar to the conversation approach, some kids are still too shy to raise concerns. Thus, the goal of this research is to create learning resources based on Scratch that may be utilized in online business courses for Class XI BRI 2 SMK Tamansiswa 1 Jakarta students. The learning media aims to enhance students' interest and comprehension of online business material by using Scratch's interactive characteristics and user-friendliness. Additionally, it facilitates the

development of students' problem-solving abilities and creativity within the framework of digital business.

LITERATURE REVIEW

Learning happens to humans and is a lifelong process. Learning is a necessary component of sustaining human life from the moment of birth till a child learns to nurse, grows and comprehends the guidance of their parents, and matures and comprehends lecture content. It is this capacity for learning that sets humans apart from other living things. Humans acquire knowledge so they can adjust to their surroundings. (Siregar & Widyaningrum, 2015).

Learning is the progression of teacher and student activities in carrying out a learning program, specifically an activity plan that outlines fundamental skills and key theories and includes specifics like time management, indicators for meeting learning objectives, and learning activities for the core content of each subject. (S.Winataputra, 2019)

R&D (Research and Development) is the research approach and methodology used in this study. A website-based learning media product is created through the research and development process. In addition, this kind of research will be used to gauge how feasible the proposed product is. (Sugiyono, 2021) One kind of research utilized to create a desired product is research and development. The product's validation will be examined in this kind of study.

Compared to other forms of research, this kind of development research is distinct. The outcome of this research will be a website built with Scratch that can be utilized for online business learning activities. In addition, experts will assess the research's viability and generate suggestions for enhancements that can be applied to refine the already-made products. such that following this testing, the product can be used as an educational tool (Vivien et al., 2021). The ADDIE development paradigm is utilized by researchers; it is customized into Analysis, Design, Development, and Implementation based on their requirements (Maymadya, 2017).

Phase of Analysis

The researcher will read pertinent books and examine the findings of earlier studies in order to perform a literature review at this point. This is required in order for researchers to acquire theoretical underpinnings that will enable the advancement of their study. This theoretical analysis has been modified to fit the planned development research. Researchers will analyze student needs, examine how media is used in the classroom, and examine the curricula that are taught in schools as part of the analysis stage of learning media creation. In addition, researchers will interview participants to gather data, identify issues, and provide the knowledge required to create educational materials.

Phase of design

At this point, scientists must create a development strategy based on their study. In addition, researchers must ascertain the environment in which development is taking place. Researchers will perform three tasks during the design stage: gathering information about the chosen material by analyzing learning materials; creating learning media designs; and creating instrument designs that serve as instruments for evaluating the products under development.

Phase of Development

Research development is being conducted at this stage in compliance with the previously created development strategy. This stage will involve the following activities: (1) assembling learning media designs based on Scratch, (2) creating and developing materials, creating supporting tables, creating images and graphics, typing, and arranging layouts in order to get ready for assessment tools, and (3) Conduct a validation process with media, design, and material specialists.

Phase of Implementation

At this point, the created media will be applied to instructional and learning activities. Thus, administering an expert test will be the task completed at this point. Three tests make up this expert examination: media, language, and substance.

METHOD

Researchers only employ Research and Development (R&D) up to Level 3, at which point they work on developing already-existing items. R&D at Level 3 include testing products in order to develop already-existing products. At this stage, research focuses on improving current goods to make them more effective and efficient than they were previously. Research and development is a form of research that is utilized to create a desired product, according to (Sugiyono, 2021) This kind of research will examine the product's validity.

Research and development, according to (Vivien et al., 2021) is a research plan or approach whose validity can be supported. All things considered, this kind of study is highly successful in creating new items or enhancing old ones. The ADDIE development paradigm, which consists of Analysis, Design, Development, Implementation, and Evaluation, is used in this study (Maymadya, 2017). Researchers utilize the ADDIE development paradigm, which they have customized into Analysis, Design, Development, and Implementation based on their needs.

In order to meet learning objectives, it is envisaged that Scratch-based learning materials will encourage students to think critically and analyze while engaging in educational activities. In addition, creating educational materials helps pique students' interest in persuading themselves of the subject matter in order to become proficient. It is anticipated that learning with Scratch media will enhance students' critical thinking skills, leading to better learning results.

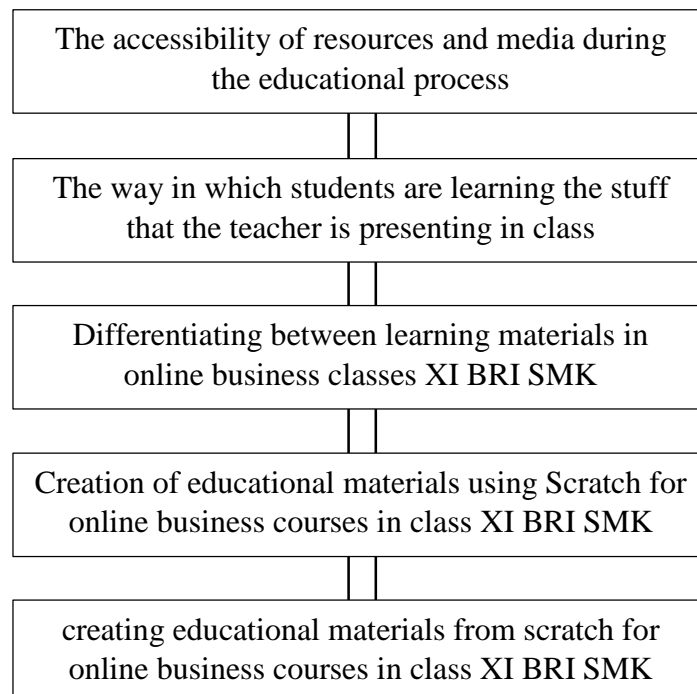| The accessibility of resources and media during the educational process |
|---|
| The way in which students are learning the stuff that the teacher is presenting in class |
| Differentiating between learning materials in online business classes XI BRI SMK |
| Creation of educational materials using Scratch for online business courses in class XI BRI SMK |
| creating educational materials from scratch for online business courses in class XI BRI SMK |

Figure 1. State of mind

The study and research employ the technique of validitarian data analysis by experts. This analysis is carried out by gathering feedback and statements from the affected parties on

the educational material that was created. This data will be analyzed to determine how to improve the product and understand the validity of the media that is being used. The following results from the media, materials, and students will be analyzed using rumus: (Satriana, 2019):

$$P = \frac{Total\ score\ for\ the\ task}{Total\ score\ by\ category} \times 100\%$$

description of symbols:

P   = Proportion of assessments

RESULTS AND DISCUSSION
Results

The results of the research and development in this study are multimedia learning materials based on Scratch for online business classes in grade 11. Internet-based business materials are the subjects covered in this interactive learning environment. In this study, the learning media are developed using the ADDIE paradigm, which has already been adjusted to the researcher's needs. The process of developing scratch-based learning media for online business materials will involve many steps that will be shown below:

1. Phase of analysis

    At this point, the researcher will conduct data collecting tasks and gather the knowledge required to assist in the development of the learning media items that will be used. To determine the extent to which educators employ learning media in the teaching and learning process, researchers interviewed educators on its deployment. In addition, researchers spoke with students through interviews to see how they reacted to the teaching resources that former instructors had given them.

2. Phase of design

    At this point, scientists must create a development strategy based on their study. In addition, researchers must ascertain the environment in which development is taking place. Researchers will perform three tasks during the design stage: gathering information about the chosen material by analyzing learning materials; creating learning media designs; and creating instrument designs that serve as instruments for evaluating the products under development.

3. Phase of development

    At this stage of development, the task will be to create a product in the form of scratch-based learning materials. This will be followed by revisions based on feedback and evaluations from validators, which will serve as a foundation for enhancing the work in progress and ensuring that the final product is usable.

    1. Development of product designs

        Researchers will generate scratch-based learning media, which will include practice questions, instructional films, and PDF learning materials. The display will look like this:

        i. Educational resources

            The course material is about selling through social media and covers topics such as understanding social media, its uses, its kinds, its advantages, its benefits for business, the advantages of selling online on social media, and how to sell on social media.

        ii. Workouts

            The practice questions in the scratch media are intended to help detect, quantify, and clarify social media sales.

    2. Scratch learning media display

The purpose of scratch learning medium is to grab students' interest while they are studying. The scratch media will include many pages, such as a home page, a page with learning resources, and a page with practice questions.

3. Professional confirmation

Expert validation is an appraisal provided by experts to provide a critical analysis of the learning media products under development. Two expert lecturers (material experts and media experts) and one retail business major instructor at SMK Tamansiswa 1 Jakarta will conduct expert validation. Ms. Annisa Lutfia, S.Pd., M.Pd., a lecturer at the Faculty of Economics, Jakarta State University, will conduct media validation, while Ms. Daru Putri Kusumaningtyas, S.E., M.Han, a lecturer at the same institution, will give material validation.

1) Verification of material expertise

Ten assertions will make up indicator questions in material expert validation. Validators will be requested to offer evaluations and recommendations for the created items. The answers to the questionnaire sent to material expert validators are listed below.

Table 1. Material expert validation statements' results

No	Question	Value Points
1.	All of the content covered in the Scratch learning resources is finished.	3
2.	The provided learning resources are built on scratch and are methodical.	3
3.	The provided Scratch-based learning materials are understandable.	3
4.	The provided Scratch-based learning materials have been put in an eye-catching bundle.	3
5.	The inquiries are phrased in an understandable manner.	3
6.	Queries in the whole media.	3
7.	The inquiries align with ideas and conceptions.	3
8.	The language employed is conversational.	3
9.	Key response in accordance with the inquiry	3
10.	The language and inquiries employed are suitable and suitable.	3
	Total rating	30

The following are the results derived from the material validation results, as can be seen in the above table:

$P = 30/50 \times 100\% = 60\%$

The validation analysis's results indicate that 60% of the material accomplishment level was attained, placing it in the fairly valid category and necessitating a revision of the product based on the material being generated.

2) Expert validation from the media

Ten assertions will make up the question indicators for the validation of media experts. Validators with expertise in the media will be requested to offer evaluations, recommendations, and remarks on the educational media products in development. The outcomes of the validator's evaluation of the given questionnaire are listed below.

Table 2. Media expert validation questions' results

No	Question	Value Points
1.	The speed of scratch learning media is not sluggish.	4

No	Question	Value Points
2.	During use, scratch learning material does not halt or hang	5
3.	All kinds of operating systems can be used with scratch learning materials.	5
4.	A range of hardware specs can be used to run scratch learning media.	3
5.	Utilize scratch learning materials in a way that makes sense.	4
6.	Scratch learning medium that operates simply.	4
7.	Users are able to engage with scratch learning materials.	2
8.	Be imaginative when applying concepts to scratch-learning materials.	2
9.	The visuals of scratch learning medium are appealing.	2
10.	One can easily read the writing on scratch learning materials.	5
	Total rating	36

The following average values were acquired as a consequence of media expert validation, as can be shown in the above table:

$P = 36/50 \times 100\% = 72\%$

The media achievement level received findings of 72%, according to the validation analysis, placing it in the valid and fit for usage category.

3) Approval from instructors

Aspects of the information provided and the created learning media will be used as question indicators in the validation process by educators. includes ten questions that will be asked. The outcomes of the evaluations that educators provided on the distributed questionnaires are listed below.

Table 3. Findings from educators' validation queries

No	Question	Value Points
1.	The terminology employed is simple to comprehend.	4
2.	Fit between the language used and the pupils' proficiency	5
3.	Correctness of punctuation mark writing	4
4.	spelling and terminology used correctly	4
5.	The content covered in the scratch learning materials has finished.	3
6.	The provided scratch-based educational content is organized	4
7.	The provided scratch-based learning materials are understandable.	4
8.	Utilize scratch learning materials in a way that makes sense.	4
9.	Scratch learning medium that operates simply	3
10.	One can easily read the writing on scratch learning materials.	4
	Total rating	39

The following are the findings from the distribution of questionnaires to educators, as shown in the above table:

$P = 39/50 \times 100\% = 78\%$

According to the findings of the questionnaire that educators were given, the accomplishment level attained a percentage of 78%, falling into the valid category and being appropriate for use in educational activities.

4. Phase of implementation

Following the validator's validation of the learning media product, the implementation phase will commence. Researchers will give surveys about the usage of scratch-based learning materials to small groups of students at this deployment stage. The outcomes of the student answers are listed below.

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Table 4. Student Question Results

No	Respondent	Number of Items										Total
		1	2	3	4	5	6	7	8	9	10	
1.	Student 1	5	5	4	4	4	3	3	2	4	4	38
2.	Student 2	4	3	3	3	3	3	4	3	2	3	31
3.	Student 3	5	5	5	5	5	5	5	5	5	5	50
4.	Student 4	5	5	4	4	4	3	2	4	3	3	37
	Total rating											156

The distribution of questionnaires to students produced the following results, as can be shown in the above table:

$P = 156/200 \times 100\% = 78\%$

Given that 78% of students completed the questionnaire, it can be concluded that scratch learning material falls into the legitimate category and is appropriate for use.

Several scratch-based media results that were obtained:

Figure 2. Developed Media

DISCUSSION

The first learning resource for social media sales content was created using the findings of the researcher's investigation. Scratch-based learning media products will be made accessible as soon as the media production process is finished. This product has to go through a validation analysis step where specialists analyze media and materials to assess suitable content before it can be used in learning activities. determining if learning media goods are appropriate.

According to the findings of the validation study conducted by media experts, 72% of the sample fell into the valid category. Following material expert validation, a score of 60% was obtained, placing the validity category under "quite valid." The accomplishment level achieved a percentage of 78%, which was included in the valid category, according to the findings of the questionnaire evaluation that was supplied to educators. Scratch-based online business content learning media is included in the valid category and is appropriate for use as learning media in the student learning process, according to the validity results obtained. Following expert validation, researchers conducted small-group experimental activities with SMK Taman Siswa 1 Jakarta class XI BR1 students. Small group testing findings provide a 78% categorization rate with a valid category, suggesting that learning activities can make use of Scratch-based learning media items.

Prior research provides support for the findings of the study and creation of educational media. The findings of the evaluation by material experts 1 and 2 yielded an average percentage of suitability for learning media of 93.18%, which may be classified as extremely practical, according to research by (Hapsari & Fahmi, 2021) It was discovered that, on average, 88.59% of the media that was learned from media experts 1 and 2 was acceptable, meaning that it was extremely practical. Learning media may be classified as extremely feasible since the average percentage of feasibility from small and large class trials is 83.18%.

The findings of the study carried out by (Grasia et al., 2023) Thus, specialists from the fields of media, language, and material expertise participated in this study. An average percentage of 89% was reached for the validation test, which was conducted by two material experts, two language experts, and two media experts. This indicates that the category was quite viable. Therefore, this demonstrates how appropriate it is to apply and test the Genially Based Interactive Infographic on Public Relations and OTK Protocol Subject Class XII SMK Negeri 50 Jakarta on students. In addition to validation testing, practicality tests are conducted. Seventy-two students in class XII OTKP at SMK Negeri 50 Jakarta passed the practicality exam. There were many phases to this practicality test: big group trials, small group trials, and one-on-one examination. With an average percentage of 95% for practicality test results, it falls into the category of extremely practical. Consequently, this demonstrates how useful Geneially Based Interactive Infographics on Public Relations and OTK Protocol Subjects Class XII SMK Negeri 50 Jakarta are for educational purposes.

The findings of the study carried out by (Rivai et al., 2023) Data shows that the validation test results for material experts were 98% in the very feasible category, validation results for language experts were 88% in the extremely feasible category, and validation results for media experts were 80% in the feasible category. It is evident that employing electronic modules based on flipbooks in the classroom is the best option.

The findings of the study carried out by (Nurmalahayati et al., 2024) The category is very feasible, as indicated by the average percentage result of 80.66% obtained from validation tests conducted by language experts, media experts, and material experts. This indicates that the Media Google Sites Based Interactive Learning on Class XI Letters Material at SMK Negeri 1 Bogor is appropriate for use and has been tested on students. In addition to validation testing, practicality tests are conducted. At SMK Negeri 1 Bogor, 107 MPLB class XI students completed the practical exam. There were two phases to this practicality test: small group trials

and big group trials. Large group trials were conducted on 97 students, while small group trials were conducted on 10 students chosen at random. With an average percentage of 89.96%, the practicality test results are considered extremely practical. This demonstrates the applicability of Interactive Learning Media Based on Google Sites in Class XI Letter Material at SMKN 1 Bogor for educational purposes.

CONCLUSION AND RECOMMENDATION

According to the findings of the validation study conducted by media experts, 72% of the sample fell into the valid category. Following material expert validation, a score of 60% was obtained, placing the validity category under "quite valid." The accomplishment level achieved a percentage of 78%, which was included in the valid category, according to the findings of the questionnaire evaluation that was supplied to educators. Scratch-based online business content learning media is included in the valid category and is appropriate for use as learning media in the student learning process, according to the validity results obtained. Following expert validation, researchers conducted small-group experimental activities with SMK Taman Siswa 1 Jakarta class XI BR1 students. Small group testing findings provide a 78% categorization rate with a valid category, suggesting that learning activities can make use of Scratch-based learning media items.

Several obstacles have been faced in the research on creating educational media using Scratch, including the following: 1) The development material used only comprises of sales content through social media; 2) The learning media created only focuses on the Scratch platform; and 3) The learning media development scope is limited. As advice for other researchers, researchers ought to think about broadening the area of their work and producing more educational resources.

The researcher makes recommendations to other researchers based on the findings of the research and development that they have conducted. Here's how this is explained: 1. When doing research and development using Scratch, researchers need to be able to identify the educational resources that will be used in the classroom and ascertain whether your school can assist in the creation of Scratch-based educational media; 2. In contrast to academics that have merely tested the efficacy of learning media, the researcher argues that future study to build learning media requires more complicated research; 3. The researcher proposes that in addition to doing more study and developing Scratch-based learning materials, other teaching resources should be created in accordance with the needs of the students.

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