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Development Of Web-Based Digital Interactive Multimedia Using Google Sites To Improve Problem Solving Skills In Tax Administration Subjects At SMK N 6 Surakarta

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Abstract: This research aims to develop web-based learning media using Google Sites as a learning solution for Tax Administration subjects at SMK N 6 Surakarta. The development was conducted using the ADDIE model which includes five stages: analysis, design, development, implementation, and evaluation. In the analysis stage, it was found that conventional learning methods were less effective in improving students' understanding of tax concepts. Web-based media was designed with interactive features, such as learning videos, practice questions, and interactive games, developed using Google Sites. Expert validation results showed that this learning media has a very good level of feasibility, with an average validation percentage of 85% from material experts and 78.33% from media experts. Implementation was carried out through a limited trial involving grade XI students, showing a significant increase in learning outcomes with an average pretest score of 84 and posttest of 93. The final evaluation confirmed the effectiveness of the media in increasing students' learning motivation and understanding. This web-based learning media provides an innovative solution that supports a more interactive, flexible, and interesting learning process, and is able to create a more meaningful learning experience for students.

Abstrak:. Penelitian ini bertujuan untuk mengembangkan media pembelajaran berbasis web menggunakan Google Sites sebagai solusi pembelajaran untuk mata pelajaran Administrasi Perpajakan di SMK N 6 Surakarta**.** Pengembangan dilakukan dengan menggunakan model ADDIE yang mencakup lima tahap: analisis, desain, pengembangan, implementasi, dan evaluasi. Pada tahap analisis, ditemukan bahwa metode pembelajaran konvensional kurang efektif dalam meningkatkan pemahaman siswa terhadap konsep perpajakan. Media berbasis web dirancang dengan fitur-fitur interaktif, seperti video pembelajaran, soal latihan, dan permainan interaktif, yang dikembangkan menggunakan Google Sites. Hasil validasi oleh para ahli menunjukkan bahwa media pembelajaran ini memiliki tingkat kelayakan yang sangat baik, dengan rata-rata persentase validasi sebesar 85% dari ahli materi dan 78,33% dari ahli media. Implementasi dilakukan melalui uji coba terbatas yang melibatkan siswa kelas XI, yang menunjukkan peningkatan hasil belajar yang signifikan, dengan rata-rata skor pretest sebesar 84 dan posttest sebesar 93. Evaluasi akhir mengonfirmasi efektivitas media ini dalam meningkatkan motivasi dan pemahaman belajar siswa.Media pembelajaran berbasis web ini memberikan solusi inovatif yang mendukung proses pembelajaran yang lebih interaktif, fleksibel, dan menarik, serta mampu menciptakan pengalaman belajar yang lebih bermakna bagi siswa.

Keywords: *Learning media development, Google Sites, ADDIE, Tax Administration, interactivity.*

INTRODUCTION

The development of technology has developed very rapidly, where almost all fields of work have been dominated by technology. Technological development is science and technology that continues to develop, bringing civilization forward (Triyanto, 2020) . Advances in information technology have many positive consequences for the advancement of education which provides offers and options for global education to support the learning process. one of them, technological developments in changing learning styles, especially the use of learning media (Kustandi, 2020) . With the development of technology, it will facilitate the learning process, and of course this has an impact on learning outcomes. Web-based multimedia learning has experienced rapid development in recent years in response to digital transformation in education (Subandowo, 2022) .

This phenomenon reflects a paradigm shift in the learning process, where education is no longer limited to physical classrooms, but can be accessed anytime and anywhere via the internet. Using the advancement of web technology, the development of interactive, dynamic and responsive learning platforms has become a major emphasis for developers and educators to build a more engaging and effective learning experience. One of the significant trends in the development of web-based multimedia learning is the increasing use of artificial intelligence (AI) technology for learning personalization. Through learning platforms, it is possible to customize learning content and methods to the individual needs and preferences of each learner. The study (Azwar, 2002) shares that the implementation of AI technology in web multimedia learning can increase student engagement, learning efficiency, and holistic academic impact.

There are still many schools or education, both formal and non-formal, where the learning process is carried out without the help of technology. According to the results of interviews and certain observations, it was found that the learning media used in tax subjects still use conventional learning media. Conventional learning media is fairly simple because it only uses books and blackboards as a tool for delivering learning material to students (Husain & Basri, 2021) . Thus, the media is less varied because teachers and students are limited to learning materials and the media used is less interesting. The lack of teachers' ability to utilize technology in the field of education is one of the reasons the learning process still takes place conventionally (Hanifah Salsabila et al., 2020) . There are several factors that cause teachers to be less adaptive to the application of technology in education, namely the low mastery of educational technology, and teachers have difficulty in using a variety of technology-based software, such as computers and gadgets (Nafi'ah, 2019) .

Limited learning media results in students being less interested and difficult to understand the material explained by the teacher (Samad & Setyabudhi, 2023) . One of the subjects that are difficult for students to understand is tax administration. Where most students find it difficult to make calculations and distinguish the journals used for each transaction. In addition, learning media in the form of PowerPoint or PDF is considered less interesting and less interactive for use in learning activities. Therefore, teachers become educators and also facilitators for students are required to be able to provide learning facilities in the form of learning media (Kemayasha, 2013) but the provision of this learning media, must be synchronized with the material and the ability of students to access it.

Therefore, it is an educator who must increase student motivation to learn. Motivation is the encouragement to do something as a result of achieving one's success in learning, this success is the result of learning (Handayani, 2021) . Motivation and student learning outcomes can be influenced by the learning media that is applied, good media can increase the learning outcomes of students (Maydiantoro, 2019) . Learning media means a very impressive component in the learning process, because learning media is one of the factors that determine whether or not a value is conveyed to students (Kamila et al., 2023)

. Learning media is used as a sense of teacher assistance to facilitate the delivery of learning material to students (Rejekiningsih et al., 2021) .

The implementation of web-based multimedia learning presents a number of significant benefits. Firstly, using greater accessibility, students can access learning materials whenever and wherever they are, increasing flexibility in the learning process (Murtado et al., 2023) . Secondly, the presence of interactive elements such as online quizzes, simulations, and institutional discussions allow learners to actively engage in learning, strengthening their understanding through hands-on experience (Palyanti, 2023) . In the context of web-based multimedia development, a holistic and integrated approach is required. This includes a deep understanding of web design discourse, the creation of engaging multimedia content, and the implementation of web development platforms such as Google Sites. Effectively combining these elements, web-based multimedia development can be a powerful tool in supporting student-centered learning, facilitating diverse and interactive learning experiences, and inspiring high interest and motivation in learning. Research and development in this area has great potential to improve the quality of learning at all levels of education.

So it can be concluded that interactive multimedia allows users to be actively involved in the activities that will be carried out. One of them is that teachers can form web-based multimedia by utilizing facilities from Google sites. Google sites is a service provided by Google that has a function to make it easy for users to produce a site (Napitu et al., 2023) . Google sites is one of the interesting tools to understand besides its free use, Google sites is also simple to design because it does not require a high programming language. In addition, Google sites also frees users to collaborate on its utilization. Google sites is a service that can be utilized for learning media in the form of a website (K. Setiawan et al., 2022) .

With the help of Google sites, website-based interactive multimedia can be developed as an alternative learning media. So that learning materials can be packaged in one container, where in addition to containing learning materials can also be equipped using animated videos, practice questions, and interactive games. This is also supported by research (A. K. Putri & Susilowibowo, 2023) with the title "Development of Tangible Fixed Assets Material Learning Website by Utilizing Google Sites", it is concluded that the use of this learning website is very effective because all news related to learning materials and practice questions can be accessed on one website. In addition, the website-based learning media that has been developed is in accordance with technological developments, practical to use, interesting, and facilitates understanding of learning materials for students. thus, this research uses the development method. aims to develop learning media that have been applied, determine the validation of existing learning media and apply media to fulfill the ability to solve problems in tax administration subjects, the model used is the ADDIE model.

To test the effectiveness of the product obtained, this research uses the research and development (R&D) method. Where development research itself means research activities using the aim of making product designs and developing them and assessing the effectiveness of the product (Sugiyono, 2018) and this research uses using the ADDIE development design (Analysis, Design, Development, Implementation, and Evaluation). The ADDIE model is an example of development used in learning devices. ADDIE model means the abbreviation of analyze, design, develop, implement, evaluate (Andi Rustandi & Rismayanti, 2021) . These five stages are interrelated and structured, meaning that from the analysis stage to the assessment stage in the implementation must be in order / systematic and cannot be done randomly. These five steps mean simple steps compared to using other development models (D. A. Putri & Pratiwi, 2022)

This research focuses on the development of interactive multimedia based on Google Sites as a solution to overcome the challenges in learning tax administration in Vocational High Schools (SMK). The research subjects include teachers who teach tax administration and vocational students who study the material. The research object includes the implementation of interactive multimedia technology in the context of tax administration learning, with the aim of increasing the understanding of complex tax concepts, improving the quality of teaching, and increasing student engagement and motivation to learn through a more interactive and innovative approach. The following are the stages of development:

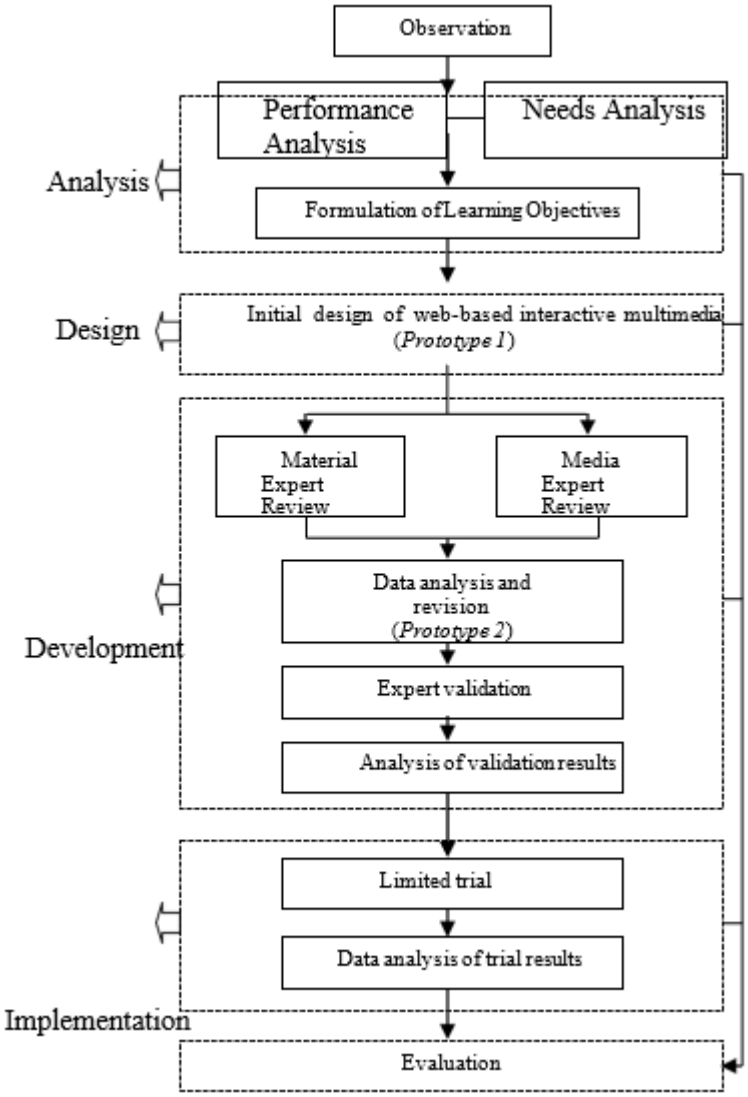


Figure 1. Interactive Multimedia Development Procedure

Source: Branch (2009) modified by the researcher

The procedure is a step taken before developing (Waruwu, 2024) . The development mechanism is used so that the product development carried out is more directed and in accordance with the procedure. The test subjects were carried out by Accounting Education Study Program lecturers and Tax Administration subject teachers at SMK 6 Surakarta.

The analysis stage in the development of interactive multimedia for learning tax administration at SMK 6 Surakarta begins with observation of the learning process to understand the current situation, identify the obstacles of students and teachers, and collect data on learning needs. Performance analysis was conducted to assess learners'

understanding of the material and evaluate the teaching methods used, while needs analysis was conducted through interviews to determine the need for more interactive learning media. Based on the results of this analysis, learning objectives were formulated to improve learners' understanding through the use of interactive multimedia. At the design stage, an initial design of Google Sites-based multimedia was created, including content structure, layout and interactive elements that support an engaging and easy-to-understand learning experience. This design is then reviewed by material and media experts to ensure content accuracy and interactivity quality, with expert feedback used to refine the design before the development stage continues.

In the development stage, interactive multimedia for tax administration learning is prepared by producing content and interactive elements such as videos, animations and quizzes using Google Sites. After the content and interactive elements were completed, data analysis and revision were conducted to refine the first prototype into the second prototype. The second prototype was then validated by material experts and media experts to ensure suitability to the learning objectives and user needs. The validation results were analyzed for further improvements before implementation in the real learning environment. In addition, a pre-test was conducted to measure learners' initial understanding.

In the implementation stage, the validated multimedia was tested in several classes of SMK 6 Surakarta to assess its effectiveness in improving students' understanding. After the trial, a post-test was conducted to measure the improvement of students' understanding. Data is collected through observations, interviews, and questionnaires to assess the success of multimedia in achieving learning objectives. In the evaluation stage, a comprehensive assessment was conducted to assess the effectiveness of multimedia, student engagement, and feedback from teachers and learners. The results of the pre-test and post-test were analyzed to determine the improvement of students' understanding, and recommendations for improvement were made for further multimedia development.

RESULTS AND DISCUSSION

In the research results, some information obtained from the development of web-based interactive multimedia learning media using the ADDIE development example which consists of analysis, design, development, implementation, and evaluation stages. The following is an explanation of each stage:

1. Assessment Stage

In this stage, several stages of analysis are carried out, namely problem analysis, needs analysis, and analysis of learning objectives. the results of these activities are used as the basis for the development of interactive multimedia. the analysis stage begins with an analysis of the problems that occur, where it is known that the learning process at the State Vocational High School 6 Surakarta is limited in providing appropriate learning media. learning activities that take place refer to books and some materials presented on the internet. This causes students to lack material and examples of more varied problems to deepen the material. In addition, based on the problem analysis, it is also known that in learning activities some teachers have utilized learning media in the form of PowerPoint or PDF. however, its use is less effective, this is because the media requires a large enough storage space so that not all Hanphone students can access it. at the State Vocational High School 6 Surakarta itself has been equipped using several technologies, but schools and teachers are less than optimal in utilizing their users. This is due to the limitations of schools and teachers in developing technology-based learning media. thus causing learning activities as less interesting and even tend to be monotonous.

Furthermore, a needs analysis is carried out, where it is known that many students find it difficult in tax administration subjects. Especially in material related to tax transactions This is caused because the material is included in the calculation material. Where most students have difficulty doing calculations for each transaction that occurs. In addition, because of the limitations in providing learning media and the limitations of the problem model, it is difficult for students to understand the learning material. so that based on the problem analysis and also the needs analysis, the researcher is interested in building learning media in the form of interactive multimedia Google Sites for tax administration subjects. The use of media in the form of interactive multimedia can help activities to deliver learning materials more effectively and efficiently (Nafi'ah, 2019) .The analysis carried out next means the analysis of learning objectives, this analysis aims to find out what learning objectives must be achieved by students and the scope of learning material that must be presented on the media developed.

2. Design Stage

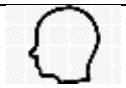
The design stage is intended to make it easier for researchers to design learning media product development. Research was conducted to build learning media in the form of interactive multimedia using the help of Google Sites. Google Sites has various supporting features that can be utilized, these features can be filled with various learning materials. Based on Istiqomah (2016) Google sites is a product designed by google as a tool for creating websites. Where the output of the interactive multimedia developed is in the form of a website. Google Sites means a service that can be utilized as a learning medium

based website (Bhagaskara et al., 2021). Multimedia with the help of Google Sites can be linked using links, such as youtube links, quizzes, wordwall games links and so on. In addition, it can also be connected to various other Google products, including Google Form, Google Drive, Google Sheet, Google Document, and so on (Mukti & Anggraeni, 2020). Another advantage of Google Sites is that the media created can be used using a variety of electronic media, such as tablets, PCs, cellphones, and laptops.

At the design stage, it is made related to the design of features that will be developed in interactive multimedia. multimedia will be equipped using various features, namely the home feature, instructions for use feature, learning objectives feature, learning video feature, learning material feature, question model feature, question exercise feature, interactive games feature and cover, and developer profile feature. In addition, the design stage also prepared various components needed in interactive multimedia. The components prepared are the design of materials, sample questions, and practice questions, the design of feature icon components, the cover design of each feature page, the cover design for materials and practice questions, image illustrations and other components. make the design of feature icons, feature page covers, material page covers, illustrations and so on are designed with the help of the Canva application. The following is a view of the feature components in interactive multimedia.

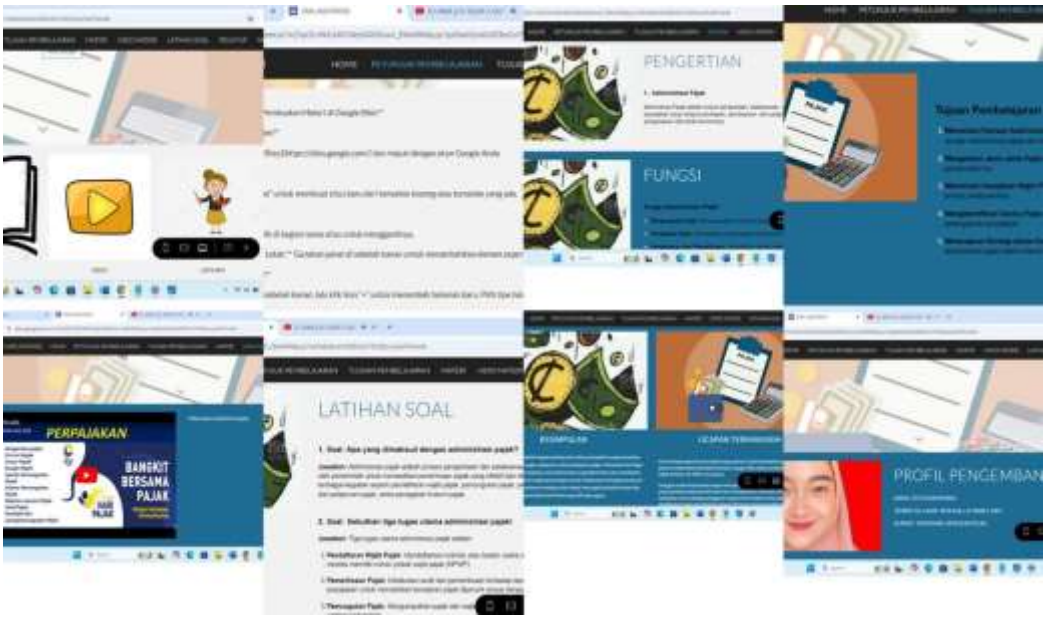
Table 1. Interactive Media Components

No.	Features	Explanation	No.	Features	Explanation

1		Home on interactive multimedia google sites	5		Videos related to tax administration learning materials
2		Instructions for use	6		Sample questions containing tax administration exercises
3		Tax administration learning objectives	7		A closing that contains conclusions and thanks to google site users.
4		Learning materials containing tax administration	8		Developer profile

3. Development Stage

The development stage is carried out as an effort to realize the design that has been made before. The implementation of this research aims to produce interactive multimedia in Islamic banking accounting subjects. After the design stage is complete, each component that has been made is merged into one in Google Sites. This interactive multimedia is equipped with various features, namely home features, instructions for use features, learning objectives features, learning video features, subject matter features, sample problem features, practice problem features, interactive games features, closing features and there is a developer profile feature. The following is a view of the interactive multimedia.



Source: Data Processed by Researchers

From this stage the initial product is obtained (Prototype 1). in making products using Google Sites. based on the opinion expressed by Ferismayanti (2020) Google sites means products designed by Google to be a tool for forming websites. This interactive multimedia consists of a home page or the initial page of the media. this home page contains the name of the media, instructions for use, developer profile. on the learning material sub contains basic competencies, learning objectives, material, learning videos, practice questions. review activities by material experts and media experts, given a review sheet to material experts and media experts to provide opinions and suggestions regarding Prototype 1.

Then the results of the review were analyzed and revised the product in accordance with the opinions and suggestions given by the experts so as to form Prototype 2. interactive multimedia validation activities into learning media by material experts and media experts, given the validation sheet of material experts and media experts to convey their assessment of the interactive multimedia developed. in each material there are learning objectives, material, learning videos, practice questions to choose, learning objectives in each material are adjusted to the Tax Administration subject and continued using the preparation of learning materials. Learning videos are designed based on material that has been compiled and videos taken from YouTube sources in accordance with tax administration material. Furthermore, making exercise questions. Exercise questions are designed using several fill-in questions on tax material.

From this stage of development will make the initial product or prototype I. Furthermore, prototype 1 is reviewed and validated by experts. for the material includes one teacher teaching Accounting subjects at State Vocational High School 6 Surakarta. In addition, the media expert comes from one Accounting Education Lecturer who teaches Media courses at UMS. Prototype 1 is submitted by experts to be reviewed using a questionnaire that has been designed. what will happen from this review is expert advice and input which is used as a reference for revision or improvement to improve the product. The following is a recapitulation of suggestions and input generated from experts.

Table 2. Recapitulation of Experts' Revision Results

No.	Material Expert Revision	Media Expert Revision
1.	In the material explanation section more material is added related to taxes	For the design of the material and question section, there needs to be a difference for each slide.
2.	It is necessary to add examples of cases Tax and calculation materials	The media section needs to feature a discussion forum
3.	For the concept of material more aimed at On tax administration	In the design and layout, it is further enhanced
4.	In the question section, there is a need to improve questions and answers related to the material.	

5.	Practice questions on Basic Tax Competencies Income Tax Article (ITA) 21 should have more practice questions/case questions.	

Source: Data processed by researchers (2024)

Furthermore, after the review activities, the product was revised or improved based on the suggestions and input provided by the experts. After completion of the revision and improvement activities, prototype 2 will be produced.

Furthermore, the improved media products were submitted back to the experts in order to be validated so that the feasibility of the developed products was known. This validation activity uses a validation questionnaire that has been previously designed. The expert validation analysis is used as the basis for determining the feasibility of interactive multimedia. The eligibility criteria for interactive multimedia are assessed from three aspects as revealed by Walker & Hess including aspects of content quality and objectives, instructional quality, and technical quality (Shofiyah, 2018) . Below is shown for the results of the analysis of expert validation that has been done before.

Figure 3. Diagram of Material Expert Validation Results

Source: Data processed by researchers (2024)

Material validation was carried out by Mrs. Nurkayati, S.Pd. Based on the calculated material validation results, it shows the overall average results of the questionnaire which range very good and good with numbers 95 and 75 with a total percentage of 85% which is declared very feasible. So, the conclusion obtained is that interactive multimedia is feasible to proceed to the user response stage.

Figure 4. Recap of Media Expert Validation Results

Source: Data processed by researchers (2024)

While media validation was carried out by Mr. Rochman Hadi Mustofa S.Pd., Gr., M.Pd Lecturer in accounting learning media courses in accounting education study programs as media experts. Based on the calculated material validation results, it shows the overall average results of the questionnaire which range very good and good with numbers 95 and 75 with a total percentage of 78.33% which is declared feasible. These results confirm that the media developed in the form of interactive multimedia is able to provide learning opportunities for students, provide learning assistance, and provide learning motivation for students.

4. Implementation

The implementation stage is the stage for conducting product trials. This trial aims to determine whether the media that has been developed has a good level of effectiveness or not, namely through a student response questionnaire. Interactive multimedia learning media that has passed the stage of data analysis, revision and validation of experts so as to produce Prototype 2, then conducted a limited trial. The trial was conducted at SMK N 6 Surakarta in class XI AKL 1 with a total of 36 students. With a pretest and posttest system. The trial first began by introducing the purpose of conducting product trials and continued with the introduction of interactive multimedia products. Then students work on pretest questions before the material is displayed. After that, students listened to the material that had been displayed through the projector. and at the end of the trial, students were asked to fill out a user response questionnaire after the material and media were displayed. The following presents the results of the pretest and posttest user assessment of the developed media:

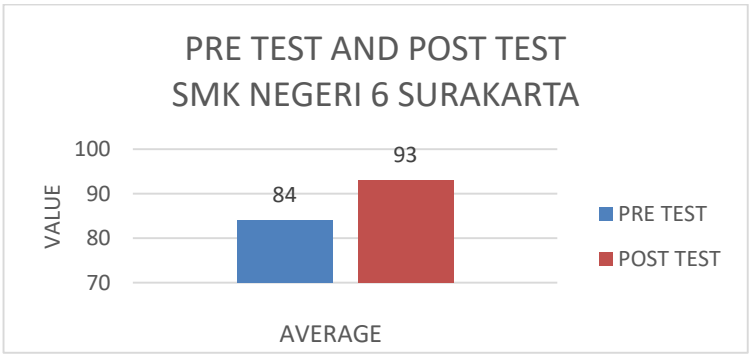


Figure 5. Diagram of User Response Assessment Results

Source: Data processed by researchers (2022)

Based on the recapitulation of the pretest and posttest user response questionnaires to web-based interactive multimedia in the Tax Administration subject that has been presented, the pretest average is obtained before the material and media are displayed with a total of 84 which can be categorized as good, and the posttest results after the material and media are displayed to students with a total of 93 are categorized as very good, meaning that interactive multimedia obtains a very good level of effectiveness that is easy to operate and use by users, so that it can be used as a supporting medium in the learning process by students.

So that in the research the overall analysis results can be concluded that DIAKSY (Digital Sharia Accounting) interactive multimedia in Islamic banking accounting subjects is able to help facilitate the implementation of learning and help increase understanding of learning materials. Utilization of interactive multimedia used for media in learning can help facilitate understanding of student material (Septiani et al., 2020). And based on the recapitulation of the user response questionnaire of the research DIGITAX Interactive Multimedia Development (Digital Tax Administration Media) Web-Based Using Google Sites on Tax Administration Subjects Class XI SMK that has been presented, the average of all aspects is analyzed and the average results of multimedia users are obtained with a percentage of 97.92% which can be categorized as very good, meaning that interactive multimedia obtains a very good level of effectiveness that is easy to operate and use by users, so that it can be used as supporting media in the learning process.

5. Evaluation

The evaluation stage is a process to assess whether or not the media that has been developed is in accordance with the original objectives determined. According to the opinion of Pratiwi et al. (2019) this evaluation is carried out at each stage of the ADDIE development model, which is not only done at the end. Evaluation in ADDIE development is divided into two, namely formative and summative evaluation. Formative evaluation activities are applied at each stage of development so that improvements can be made for product perfection, while for summative evaluation activities carried out at the end of the development stage to see the effect of the product on learning outcomes and learning quality (Arif, 2019) .

The evaluation is carried out by analyzing questionnaires from material experts, media experts and user response questionnaires so that it can be seen whether the developed product is feasible or not to use (Hutapea, 2019) . Based on the overall analysis, it can be seen that this interactive multimedia is very feasible to be used as a learning medium. As well as the implementation of response evaluations and questionnaires from students, namely that students feel helped by the delivery of material using google sites, notes on the class situation when research is held about safe and conducive classes and notes from field teachers who participate in seeing research that is carried out well and the material displayed is quite easy to understand.

DISCUSSION

The results of this study indicate that the development of web-based interactive multimedia using the ADDIE model has successfully improved the quality of learning Tax Administration at SMK N 6 Surakarta. At the analysis stage, it was found that conventional learning using static media, such as books, PowerPoint, and PDF, was less effective in helping students understand complex material, especially related to the calculation of tax transactions. In addition, teachers' limitations in utilizing technology are also a major

obstacle. Therefore, the use of interactive multimedia based on Google Sites is seen as a potential solution to provide a more interesting and relevant learning experience.

In the design stage, this multimedia is designed with various interactive features, such as learning videos, practice questions, and games, which are arranged systematically to support more effective learning. Visual components, such as icons, illustrations, and covers, are designed with the help of Canva application to create an attractive appearance and make it easier for students to understand the material. These features are also integrated with various digital tools, such as Google Forms and Wordwall, through the Google Sites platform, providing flexibility for users to access the materials. The development stage produced the first prototype (Prototype 1), which was then validated by material and media experts. This prototype received suggestions for additional case examples, improved layout, and enrichment questions, which were then implemented in revisions to produce Prototype 2. The validation showed excellent results, with an average score from material experts of 85% and from media experts of 78.33%, indicating the feasibility of the media for the implementation stage.

The limited trial was conducted in class XI of SMK N 6 Surakarta, involving a pretest and posttest process to measure the effectiveness of the media. The results showed an increase in the average score from 84 (good) on the pretest to 93 (very good) on the posttest, reflecting the students' increased understanding of the material. In addition, students' responses to the media were very positive, with a satisfaction level reaching 97.92%, indicating that this media is easy to use and interesting. The evaluation stage was conducted formatively and summatively to ensure that the media developed was in line with the learning objectives. Formative evaluation was conducted at each stage of development to improve and refine the product, while summative evaluation showed that this media is very effective in improving student understanding. Overall, this interactive multimedia based on Google Sites is proven to be able to create a more meaningful learning experience, increase student motivation, and facilitate conducive and interactive learning. Thus, this media deserves to be used as an innovative and relevant learning tool for Tax Administration subjects.

Other research shows that the ADDIE model is effective for developing interactive learning media in various disciplines. Dwitiyanti et al. (2020) found that the application of ADDIE for the development of Android-based physics applications resulted in high validation from material and media experts with a very feasible category. This supports the finding that ADDIE provides a flexible systematic framework for various learning media. The use of case-based media and problem-based methods is proven to improve students' problem-solving skills. Daryanes et al., (2023) found that case method-based interactive media developed with ADDIE helped students better understand the material and practice their problem-solving skills. This study is relevant to research on Tax Administration that integrates interactive elements such as quizzes and videos. Research Wahyuni et al., (2020) shows that technology-based learning media can be a solution to face educational challenges in the era of the Industrial Revolution 4.0. This media not only improves student understanding, but also trains 21st century skills, such as collaboration and critical thinking. Google Sites as a platform in this study has similar advantages, namely ease of access and collaborative capabilities.

The problem-based learning method has been widely recognized as an effective approach to developing critical thinking skills. Putri et al., (2022) reported that the application of PBL in student worksheets (LKS) designed with ADDIE resulted in significant improvement in students' mathematical communication skills. This parallels efforts to improve problem-solving skills in Tax Administration through case-based and interactive learning. The study by Putra et al., (2024) showed that interactive multimedia

based on problem-based learning greatly assisted vocational students in understanding complex concepts, such as algorithms and programming. With an increase in average pretest-posttest scores and positive responses from students, these results are in line with media development in SMK. Prasetyo et al. (2020) underlines that digital media based on mobile learning provides high learning flexibility, making it suitable to support learning outside the classroom. The implementation of Google Sites as digital media in this study reflects similar potential in creating adaptive and independent learning. Rizal et al. (2021) highlights how smartphone-based learning media can improve students' digital literacy. This finding is relevant because interactive media based on Google Sites also helps students to be more skillful in using digital technology in learning.

The development of digital game-based media, such as Scratch, shows significant improvement in students' problem-solving ability. This is due to the combination of interactive and fun elements that support problem-based learning (Rosydiana et al., 2023) . This finding is relevant to the use of Google Sites that integrates interactive elements for Tax Administration learning. Android-based mobile learning is proven effective to overcome the limitations of learning media in the classroom. Mutmainnah et al., (2023) developed an application for static fluid concepts that improved student motivation and understanding by providing the flexibility of learning anytime and anywhere. The use of Google Sites has similar benefits in supporting independent learning. Research by Wahyuliana & Andrian (2022) shows that ADDIE is effective for developing interactive learning media based on Adobe Animate CC that increases student motivation and understanding in mathematics. This supports your research results on the ADDIE structure as a systematic framework. Moodle-based e-learning designed for flat geometry improves higher order thinking skills (HOTS), such as analysis and synthesis (Sumarwati et al., 2020) . The use of interactive features on Google Sites can have a similar effect in improving students' analytical skills. Canva and Kahoot-based media are proven to improve student motivation and learning outcomes. With a game approach, students are more engaged and able to understand the material better (Br. Siahaan & Nasution, 2022) . The integration of game elements in Google Sites can create a similar experience. Retnowati et al., (2020) shows that project-based learning that integrates local wisdom is able to improve environmental problem solving skills. Integration of projects and real contexts in learning Tax Administration through Google Sites can produce the same effect. Research Putra et al., (2024) found that the use of MATLAB GUI in mathematics learning media helped improve students' mathematical connection skills with an interactive technology-based approach. This is in line with Google Sites' ability to provide visual and interactive tools for students. Tsaniyyati & Andriani (2024) developed mobile-based learning to improve science learning outcomes, demonstrating the effectiveness of technology in vocational education. This emphasizes the potential of developing similar media for Tax Administration.

Hapsari & Kuswandono (2022) showed that PBL designed with story narratives was effective in training pre-service teachers' problem-solving and critical reflection skills. The use of PBL approach in Google Sites for Tax Administration can improve students' skills in understanding real context and solving case-based problems. Maxnun et al., (2024) highlighted the importance of Higher-Order Thinking Skills (HOTS) based assessment in 21st century education. Using ADDIE, they developed a HOTS assessment instrument that helps students think critically and logically. The integration of interactive features in Google Sites supports HOTS-based learning in Tax Administration subjects. Hafizhah et al. (2024) developed Kodular application-based learning media to improve students' problem solving skills in mathematics. Expert validation shows that the media is very valid and effective to use. This is relevant to the development of Google Sites as an interactive media for Tax Administration. Hakim et al., (2021) integrated Augmented Reality (AR) technology in a math learning module. This approach was shown to improve students' problem solving

skills. Although Google Sites does not use AR, the integration of interactive visual elements can still increase student engagement. Wahyuni et al. (2024) used Articulate Storyline 3 to develop interactive media that successfully improved students' critical thinking and problem solving skills. Google Sites can offer similar results through the integration of carefully designed interactive quizzes and assignments. Amin et al. (2022) showed that web-based learning media with a problem-solving approach can increase the effectiveness of mathematics learning, including in the understanding of SPLTV. By applying similar principles, Google Sites media can be used to improve students' problem-solving skills in the context of Tax Administration.

Research Malik et al., (2023) shows that electronic-based media with the CORE model effectively improves students' problem solving skills. The implementation of this media in physics resulted in an increase in the n-gain score of 0.64 with a medium category. These results are relevant to Google Sites as an interactive media in Tax Administration, which is also designed to improve students' analytical skills. Aditya & Hiltrimartin (2024) highlighted that the use of problem-solving-based digital media for 3D geometry improved students' conceptual understanding with an average validity score of 83.3%. This media transforms abstract concepts into concrete form through digital simulation. Google Sites, although not based on 3D simulation, can still support understanding with interactive visualization. Setiawan et al. (2023)) mentioned that web-based learning media significantly improved students' mathematical problem solving skills. This media allows students to learn independently and collaboratively, with very positive student responses. Google Sites provides similar flexibility in facilitating collaborative and accessible learning.

Taufiq et al. (2021) developed augmented reality (AR) based media using Merge Cube for solar system lessons. This media achieved high validity (83.33%) and was effective in improving students' problem solving skills. Although Google Sites is not AR-based, the integration of digital technology remains an advantage in creating an interactive learning experience. Fahlevi & Aminatun (2023) reported that Smart Apps Creator -based media significantly improved students' critical thinking and problem solving skills. The N-gain for problem solving skills reached 91.64%. This shows the potential of technology-based applications to support innovative learning. Rohmantoro et al. (2023) developed problem-solving based media for air conditioning system in vocational education. This media was rated highly feasible (94.3%) and effective in training students' problem-solving skills. This parallels the purpose of Google Sites which supports case-based learning. Ee et al. (2022) integrated Problem-Based Learning (PBL) with digital media for chemistry education. This PBL-based module is effective in improving students' analytical thinking skills with high relevance to real-life contexts. Google Sites can also support PBL by adding discussion features and real cases. Zulkifli et al. (2024) used ADDIE to develop an educational game for children that improves analytical and problem-solving skills. A similar approach can be applied to enhance the gamification elements in Google Sites. Buchori et al. (2022) developed digital media based on Contextual Teaching and Learning (CTL) to improve students' math problem solving skills. The integration of contextual learning in Google Sites can increase the relevance of the material to students' daily lives.

CLOSING

The development of web-based interactive multimedia using Google Sites in the Tax Administration subject of Class XI SMK has successfully improved student understanding. The multimedia design includes materials, videos, practice questions, and interactive games developed using tools such as Canva. The pilot test at SMK N 6 Surakarta showed a significant increase in student understanding, with an average pretest score of 84 and posttest of 93. Student response to this media was also very positive, with the user response

questionnaire reaching 97.92%. Based on the evaluation results, this interactive multimedia is effective in improving students' ability to understand Tax Administration material and is very feasible to use as learning media.

REFERENCES

Aditya, P., & Hiltrimartin, C. (2024). Development of Problem-Solving-Based Digital Learning Media for Flat-Sided 3D Geometry in Junior High School. *JTAM (Journal of Mathematics Theory and Application)*,*8* (1). https://doi.org/10.31764/jtam.v8i1.17018

Amin, S., Sari, D. I., & Liesdiani, M. (2022). Development of Website-Based Learning Media Using Problem-Solving Approach on SPLTV Class X Material. *Cendekia Journal: Journal of Mathematics Education*,*6* (2). https://doi.org/10.31004/cendekia.v6i2.1432

Andi Rustandi, & Rismayanti. (2021). Application of the ADDIE Model in Learning Media Development at SMPN 22 Samarinda City. *Fasilkom Journal*,*11* (2), 57-60. https://doi.org/10.37859/jf.v11i2.2546

Arif, M. T. (2019). Education Evaluation Research. *ADDABANA Journal of Islamic Religious Education*, *2*(2), 66–75.

Azwar, S. (2002). *Achievement Tests: Function and Development of Learning Achievement Measurement*. Student Library.

Br. Siahaan, P. P. V., & Nasution, H. (2022). The Development of Learning Media Oriented to Team Games Tournament Learning Model Using Canva and Kahoot! to Improve Student's Problem Solving Ability in SMAN 10 Medan. *Fibonaci Journal: Journal of Mathematics Education*,*3* (2). https://doi.org/10.24114/jfi.v3i2.40678

Buchori, A., Pramasdyahsari, A. S., & Kholifah, S. (2022). The Development of Digital Book Media with Learning Model Contextual Teaching And Learning to Improve Student Mathematical Economic Problem Solving Skills. *Proceedings of the 2nd International Conference on Education and Technology (ICETECH 2021)*,*630* . https://doi.org/10.2991/assehr.k.220103.040

Daryanes, F., Darmadi, D., Fikri, K., Sayuti, I., Rusandi, M. A., & Situmorang, D. D. B. (2023). The development of articulate storyline interactive learning media based on case methods to train student's problem-solving ability. *Heliyon*,*9* (4). https://doi.org/10.1016/j.heliyon.2023.e15082

Dwitiyanti, N., Kumala, S. A., & Widiyatun, F. (2020). Using the ADDIE model in the development of physics unit conversion application based on Android as learning media. *Formative: Scientific Journal of Mathematics and Natural Sciences Education*,*10* (2). https://doi.org/10.30998/formatif.v10i2.5933

Ee, L. S., Xiaochen, Y., Ibrahim, N., & Surif, J. (2022). The Development of Problem-Based Learning Module Using ADDIE Model for Physical and Online Secondary Chemistry Education Classroom. *Humanika Science*, *14*(3), 65–70.

Fahlevi, R., & Aminatun, T. (2023). Development of Smart Apps Creator Learning Media Using Problem-Solving Learning Models on Global Warming Materials to Improve Critical Thinking and Problem-Solving Ability. *Journal of Science Education Research*,*9* (9). https://doi.org/10.29303/jppipa.v9i9.4311

Hafizhah, A., Syaifuddin, M., & Ummah, S. K. (2024). Validity of Problem-Based Learning Media Assisted by Kodular to Improve Problem Solving Abilities and Mathematical

Critical Thinking Abilities of Junior High School Students. *In Proceeding of International Seminar on Student Research in Education, Science, and Technology*, *1*, 484–496.

Hakim, A. R., Asikin, M., & Cahyono, A. N. (2021). The Development of Learning Module with Mobile Augmented Reality Based on 9E Learning Cycle to Improve Problem Solving Skills. *Unnes Journal of Mathematics Education Research*, *10*(1).

Handayani, T. (2021). Development of Stem-Based Digital Comic Media to Improve Elementary School Students' Science Literacy. *Journal of Elementary Education Didactics*, *5*(3).

Hanifah Salsabila, U., Irna Sari, L., Haibati Lathif, K., Puji Lestari, A., & Ayuning, A. (2020). The Role of Technology in Learning During the Covid-19 Pandemic. *Al-Mutharahah: Journal of Social and Religious Research and Studies*,*17* (2). https://doi.org/10.46781/al-mutharahah.v17i2.138

Hapsari, A. G. S., & Kuswandono, P. (2022). Designing Problem-Based Learning Through Narrative Stories for Microteaching Class Using Addie Model. *JEELS (Journal of English Education and Linguistics Studies)*,*7* (2). https://doi.org/10.30762/jeels.v7i2.2133

Husain, B., & Basri, M. (2021). E-Learning Learning during the Pandemic. In *Pustaka Aksara*.

Hutapea, R. H. (2019). Non-Test Evaluation Instruments in the Assessment of Affective and Psychomotor Learning Outcomes. *BIA': Journal of Contextual Christian Theology and Education*, *2*(2), 151–165.

Istiqomah, N. A. (2016). *THE EFFECTIVENESS OF USING GOOGLE SITES MEDIA IN WRITING OBSERVATION REPORT TEXTS FOR GRADE X STUDENTS AT MAN 2 PROBOLINGGO*. *6*(1), 1–23.

Kamila, N. H., Prasetyo, T., & Muhdiyati, I. (2023). Development of Website-Based Learning Media Using Google Sites for Class IV Animal Life Cycle Materials at SD Negeri No.178491 Pintu Pohan. *Journal of Elementary School Teaching*,*2* (2), 133-144. https://doi.org/10.56855/jpsd.v2i2.782

Kemayasha, K. (2013). *Development of Interactive Multimedia Using the Borg and Gall Model for the Productive Lesson of Combining Digital Photography into Multimedia Presentations at Smk Negeri 3 Singaraja.*. 1–22.

Kustandi, C. and D. D. (2020). Learning Media Development. *Jakarta: KENCANA*.

Malik, A., Al-Hanafi, M. A., Chusni, M. M., & Nugraha, A. R. (2023). Development of CORE-based Electronic-modules to Improve Students' Problem-Solving Skills. *Journal of Science Education Research*,*9* (8). https://doi.org/10.29303/jppipa.v9i8.3172

Maxnun, L., Kristiani, K., & Sulistyaningrum, C. D. (2024). Development of hots-based cognitive assessment instruments: ADDIE model. *Journal of Education and Learning*,*18* (2). https://doi.org/10.11591/edulearn.v18i2.21079

Maydiantoro, A. (2019). Models of Development Research (Research and Development). *Journal of Research Methods*, *10*, 1–8.

Murtado, D., Hita, I. P. A. D., Chusumastuti, D., Nuridah, S., Ma'mun, A. H., & Yahya, M. D. (2023). Optimizing the Use of Online Learning Media as an Effort to Improve Student Learning Outcomes in Senior High School. *Journal on Education*,*6* (1). https://doi.org/10.31004/joe.v6i1.2911

Mutmainnah, B., Amni, Z., & Wahyudi, M. (2023). Development of Android-Based Mobile

Learning Media Using ADDIE Model on Static Fluid Topics for High School 11th Grade Students. *Constant-Journal of Physics and Physics Education*, *8*(2), 125–133.

Nafi'ah, S. A. (2019). Hilda Taba's Curriculum Development Model for the 2013 Curriculum in Sd / Mi. *As-Sibyan*, *2*(1), 21–38.

Napitu, F. R., Fitri, I. N., Limbong, J., & Sulistiani, N. R. (2023). Utilization of Google Sites as Learning Media in Science Subjects in Class III Elementary School. *Siliwangi Journal of Education Series*, *9*(1), 1–6.

Palyanti, M. (2023). Fun and Fun Learning Media to Increase Student Learning Motivation in Indonesian Language Courses. *Attractive: Innovative Education Journal*, *5*(2).

Prasetyo, D., Wibawa, B., & Musnir, D. N. (2020). Development of Mobile Learning-Based Learning Model in Higher Education Using the Addie Method. *Journal of Computational and Theoretical Nanoscience*,*17* (2). https://doi.org/10.1166/jctn.2020.8740

Putra, J. A., Nurdin, E. A., & Fatimah, N. S. (2024). Design And Develop Interactive Multimedia Applying Problem-Based Learning To Enhance Problem-Solving Skills: Design and Develop Interactive Multimedia Applying Problem-Based Learning Model to Enhance Problem-Solving Skills. *Bit-Tech*, *6*(3), 329–339.

Putri, A. K., & Susilowibowo, J. (2023). *Development of Practicum Media Using Integrated Google Site on Inventory Recording Material for Grade XI SMK. 2010*, 52–64.

Putri, A. N., Suparman, S., & Sotlikova, R. (2022). Development of Mathematical Communication Skill through Worksheets Integrated Problem Based Learning using ADDIE Model. *Asian Journal of Assessment in Teaching and Learning*,*12* (1). https://doi.org/10.37134/ajatel.vol12.1.9.2022

Putri, D. A., & Pratiwi, V. (2022). Development of Web-Based DIGITAX (Digital Tax Administration Media) Interactive Multimedia Using Google Sites in Tax Administration Subjects for Grade XI SMK. *Journal of Accounting Education (JPAK)*,*10* (2), 94-105. https://doi.org/10.26740/jpak.v10n2.p94-105

Rejekiningsih, T., Budiarto, M. K., & Sudiyanto, S. (2021). Development of Interactive Multimedia Based on Local Potential for Workshop and Entrepreneurship Learning in Senior High Schools. *Kwangsan: Journal of Educational Technology*,*9* (2), 167. https://doi.org/10.31800/jtp.kw.v9n2.p167--185

Retnowati, R., Istiana, R., & Nadiroh, N. (2020). Developing Project-Based Learning Related to Local Wisdom in Improving Students' Problem-Solving Skills. *JETL (Journal of Education, Teaching and Learning)*,*5* (1). https://doi.org/10.26737/jetl.v5i1.1035

Rizal, R., Rusdiana, D., Setiawan, W., & Siahaan, P. (2021). Development of a problem-based learning management system-supported smartphone (PBLMS3) application using the ADDIE model to improve digital literacy. *International Journal of Learning, Teaching and Educational Research*,*20* (11). https://doi.org/10.26803/ijlter.20.11.7

Rohmantoro, D., Purnomo, B. G., Yoanita, Y. V., & Yulanto, D. M. (2023). Development of Learning Media Practicum Air Conditioning System Based on Problem Solving in Vocational Education. In *Proceedings of the 1st UPY International Conference on Education and Social Science (UPINCESS 2022)*. https://doi.org/10.2991/978-2-494069-39-8_40

Rosydiana, E. A., Sudjimat, D. A., & Utama, C. (2023). Effect of Digital Learning Media Using Scratch Game Based Learning on Student Problem Solving Skills. *Journal of Science Education Research*,*9* (11). https://doi.org/10.29303/jppipa.v9i11.4876

Samad, & Setyabudhi, A. L. (2023). Application of video-based learning media with applications to improve learning activities of vocational high school students. *Technical and Vacational Education International Journal*, *3*(1).

Setiawan, H., Handican, R., & Rurisman, R. (2023). Revolutionizing Math Education: Unleashing the Potential of Web-based Learning Media for Enhanced Mathematical Problem Solving Skills. *JDIME: Journal of Development and Innovation in Mathematics Education*, *1*(2), 1–11.

Setiawan, K., Naomi, S., & Winata, W. (2022). Development of Google Sites-Based Learning Media Design for Teachers in Online Learning at Harapan Ibu Islamic Junior High School, South Jakarta. *Journal of Instruction*, *4*(1), 73–82.

Shofiyah, S. (2018). Principles of Curriculum Development in Efforts to Improve Learning Quality. *Edureligia; Journal of Islamic Religious Education*,*2* (2), 122-130. https://doi.org/10.33650/edureligia.v2i2.464

Subandowo, M. (2022). Education Technology in the Era of Society 5.0. *Sagacious Journal*, *9*(1).

Sugiyono. (2018). *Quantitative, Qualitative, and R&D Research Methods*. Alfabeta.

Sumarwati, S., Fitriyani, H., Setiaji, F. M. A., Amiruddin, M. H., & Jalil, S. A. (2020). Developing mathematics learning media based on elearning using moodle on geometry subject to improve students' higher order thinking skills. *International Journal of Interactive Mobile Technologies*,*14* (4). https://doi.org/10.3991/IJIM.V14I04.12731

Taufiq, M., Nuswowati, M., & Widiyatmoko, A. (2021). Feasibility study of a solar system learning media based on merge cube augmented reality to embed problem solving skills. *Journal of Physics: Conference Series*,*1918* (5). https://doi.org/10.1088/1742-6596/1918/5/052064

Triyanto, T. (2020). Opportunities and Challenges for Character Education in the Digital Age. *Journal of Civics: Media for Citizenship Studies*,*17* (2), 175-184. https://doi.org/10.21831/jc.v17i2.35476

Tsaniyyati, L., & Andriani, A. E. (2024). Development of Mobile Learning based on Problem Solving to Improve IPAS Learning Outcomes. *Journal of Science Education Research*, *10*(9), 7086–7094.

Wahyuliana, N., & Andrian, D. (2022). Development of triangular learning media based on adobe animate CC with ADDIE learning design. *International Journal of Trends in Mathematics Education Research*,*5* (4). https://doi.org/10.33122/ijtmer.v5i4.159

Wahyuni, M., Medriati, R., & Setiawan, I. (2024). Development of Interactive Learning Media Assisted by Articulate Storyline 3 to Train High School Students' Problem-Solving Skills. *Asian Journal of Science Education*, *6*(1), 95–107.

Wahyuni, S., Rahayu, Y. S., & Indana, S. (2020). Development of Problem-Based Learning Student Worksheets to Facilitate Students' Problem Solving Skills. *Journal of Science Education Research*,*6* (2). https://doi.org/10.29303/jppipa.v6i2.427

Waruwu, M. (2024). Research and Development (R&D) Methods: Concepts, Types, Stages and Advantages. *Scientific Journal of Education Profession*,*9* (2), 1220-1230. https://doi.org/10.29303/jipp.v9i2.2141

Zulkifli, N. N., Zhang, Y., Ayub, A. F. M., & Nawi, N. R. C. (2024). From Analysis to Creation: Utilizing the ADDIE Model for Developing and Educational Game for

Children. *The Asian Conference on Education 2023: Official Conference Proceedings.* https://doi.org/10.22492/issn.2186-5892.2024.156