Design of Augmented Reality-Based Interactive Learning Media on PISAV Subjects

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Abstract - **This research is motivated by the low interest of students in participating in the PISAV learning process which causes students not to understand the learning material well. This is thought to occur because teachers have not utilised the technology that has developed in the learning process optimally, especially in learning tools, learning media are still conventional, and there is no availability of AR-based interactive learning media with Assemblr Edu, AR works in real-time to present objects in three-dimensional visuals. Of the several learning media that have been used are power point media and learning videos from YouTube. In line with the implementation of the independent curriculum and the rapid development of technology, it is necessary to develop learning media that can be applied on mobile devices, as well as in the form of printed media such as newspapers, books, and magazines. This study aims to produce valid and practical products in the form of AR-based interactive learning media using the Assemblr Edu application in the subject of Audio Video System Planning and installation at SMK Negeri 2 Solok. This type of research is Research and Development (R&D) with the 4-D model which includes the Define, Design, Develop, and Disseminate stages. the results of validation by material experts obtained an overall percentage value of 92% with the description "Very Valid". Validation by media experts obtained an overall percentage value of 93% with the description "Very Valid". The results of the practicality test or user trial by 15 students in class XI TAV SMK Negeri 2 Solok obtained an overall percentage value of 89% with the description "Very Practical". In addition, the media produced is able to attract the attention of students and increase student learning motivation. Thus, this learning media is declared "Very Valid" and "Very Practical" for use in class XI Audio Video Engineering in Audio Video System Planning and Installation Subjects.**

Keywords - **Augmented Reality, Assemblr Edu, Interactive Learning Media, PISAV, R&D.**

I. INTRODUCTION

The development of technology in the 21st century is very influential in the utilisation of information-based technology in various aspects of life. The 21st century is considered the era of knowledge, where information systems and digital media are increasingly widespread, and technology continues to develop. The use of information and communication technology (ICT) in the scope of education and the learning process is an important innovation in the world of education [1]. Examples of innovation in information technology-based education in the 21st century include the use of learning videos, educational games, digital learning content, Augmented Reality (AR) or Virtual Reality (VR), and Blended Learning.

Innovation in the field of education can improve the quality in the field of education such as, education equity, quality improvement, increasing the effectiveness and efficiency of education, and the relevance of education [2]. Based on this exp lanation, innovation is needed in the field of education, so that education can develop following the flow of technological developments that are increasingly advanced. One of the innovations developed in the field of education is learning media [3].

Education is an effort to improve a person's skills and character. In this context, improving the quality of education is assessed based on students' learning achievements [4]. Basically, education is an activity that can affect human life for the better. According to [5]the purpose of education is to influence students so that they can adapt to their environment and create positive changes in their lives.

The curriculum has a very important position and serves as an elaboration of the vision, mission, and educational goals of a particular educational institution. In line with research [6]. In the world of education, the most powerful influence related to technology is curriculum change or development. In order for the quality of education to advance, curriculum changes need to be made with a view to technological changes and developments. The Merdeka Curriculum is an effort to improve the relevance and quality of education, including in the SMK environment. The successful implementation of the Merdeka Curriculum in SMK also depends on the availability of facilities and infrastructure. This includes learning facilities, technological devices, and relevant and up-to-date teaching materials.

Based on the results of observations at SMK Negeri 2 Solok, researchers found problems in the Electronics Engineering Department of the Audio Video Engineering Expertise Program, especially in element 3, namely the Planning and

Installation of Audio Video Systems (PISAV) subject. These problems include the low interest of students in participating in the PISAV learning process which causes students to not understand the learning material well. this is thought to be because the teacher has not made optimal use of the technology that has developed in the learning process, as well as the teacher's unpreparedness with frequent curriculum changes and the lack of technology utilisation in learning tools. In addition, from the observations that researchers have made in educational field practice activities, it is revealed that there are still students who are less enthusiastic in participating in the learning process, students tend to be passive when learning takes place and teachers are still less dominant in controlling the class with a variety of selection / use of interactive, innovative and adaptive learning media in the learning process of Audio Video System Planning and installation (PISAV) in accordance with the development of Science Technology and Arts (IPTEKS). The following is data on the results of PTS (Mid-Semester Assessment) Class XI TAV 1 SMK Negeri 2 solok.

TABLE I
PTS RESULT SCORE RANGE

No	Range of learners' scores	Number of learners (Person)	Percentage of learners (%)
1	< 78	15	50%
2	79-85	8	27%
3	86-100	7	23%
	Total number of learners	30	100%

Based on the data in table I, the results of the Midterm Assessment (PTS) of class XI TAV 1 show that many learners do not reach the Learning Objective Completeness Criteria (KKTP). Based on the total number of students, namely 30 students, there are 15 students who are still below the limit of completeness, with a percentage of 50%. Based on the analysis of the PTS results that have been presented, it can be concluded that students are not optimal in participating in the learning process.

Another problem that researchers find is that learning is still fixated on textbooks, Student Worksheets (LKS) and conventional media such as Microsoft Power Point, learning videos that are less relevant, and also image media that are less effective and innovative. The use of learning media in the learning process can arouse new desires and interests, and arouse learning motivation.

Learning media is one component that has an important role in the learning process, where learning media helps the learning process to be more effective and optimal. Quality learning will get maximum student learning outcomes. [7]. While interactive learning media is an intermediary tool for delivering learning material by teachers to students where its use creates interaction between students and the media, by interrelating and providing mutual action and reaction between one another [8]. One of the developments in learning media that is currently new is learning media that uses Augmented Reality (AR) technology. [9].

Augmented Reality (AR) can be defined as a technology that is able to combine virtual objects in two dimensions or three dimensions into a real environment and then display them or project them in real time. [10]. There are many software that can be used in making AR, one of the software used for making AR is Assemblr Edu.

Assemblr is a mobile-based application where users can produce three-dimensional (3D) works by combining several available objects. The application provides Augmented Reality (AR) technology that can create and share interactive teaching materials because of the interesting 3D images and animations that can arouse the curiosity of students.

Previous research that is relevant to the research conducted by researchers used as a foundation includes research by Widya et al, Nugrohadi & Anwar, and Sugiarto. Research [11] concluded that "Learning through the use of Assemblr Edu learning media applications can improve student learning outcomes". Research from [12] also concluded that "Students also assess that there is relevance between AR media, the material provided with the duties and functions that must be fulfilled by students as Pancasila students, which is indicated by 52% of students feeling very relevant and 42.2% feeling relevant". and [13] concluded that three-dimensional (3D) media using Augmented Reality (AR), Assemblr Edu was able to increase students' understanding up to 96.97% so that they were motivated to learn. [14].

Based on the results of previous research on Augmented reality-based learning media, it is hoped that this learning media can make the learning process more effective, facilitate the delivery of material and increase students' interest in participating in learning, so that students become more enthusiastic in learning, and can improve their learning outcomes. Therefore, researchers want to design this AR-based learning media through research with the final project title "Designing Interactive Learning Media Based on Augmented Reality in Learning Planning and Installation of Audio Video Systems in Class XI TAV SMK Negeri 2 Solok".

The purpose of this research is to produce learning media in the subject of Audio Video System Planning and Installation using Augmented Reality-based Assemblr Edu, knowing the validity and practicality of learning media in the subject of Audio Video System Planning and Installation using Augmented Reality-based Assemblr Edu.

II. METHODS

The type of research used is development research/R&D (Research and Development). The research and development method is a research method used to produce certain products and test the effectiveness of certain products. [15]. The development of the method that researchers will use is the Four D (4D) Model. This 4D model has 4 stages, namely, Define, Design, and Development and Dissemination. [16]. This model was chosen because it has the advantages of being very suitable for the development of learning devices, expert validation, and the stages of implementation are divided in detail. Where this model is relevant to this research which aims to produce valid and practical products in the form of AR-based interactive learning media using the Assemblr Edu application in the subject of Audio Video System Planning and installation at SMK Negeri 2 Solok.

Testing the practicality of this learning media was carried out after the product was revised in accordance with the

improvements or suggestions that had been given by the validator. In this study, the practicality was evaluated through a limited trial involving 15 students, and the practicality of this learning media was assessed through the use of questionnaires filled out by students. Testing in this study was carried out in two stages, namely the validity test stage and the practicality test stage.

A. Validation Stage

The validation stage of interactive learning media is carried out by validators who are experts in their fields, in this case there are two validators in question, namely validators from material experts and media experts. Validity analysis from experts is carried out to determine the validity/validity of an interactive learning media that has been designed. Validity is carried out in two fields, namely the validity of material experts and the validity of media experts. [17]. The purpose of validation by both experts is to get input, improvements and corrections related to the media that has been designed. This interactive learning media will be validated by 4 experts divided into 2 material experts and 2 media experts.

1) Material Expert Validation: Validation by material experts is a correction stage carried out by material experts to obtain data in the form of media feasibility in terms of material content and elements used in the designed media. Validation by material experts was carried out by 2 people, namely, FT-UNP Electronics Engineering Lecturers and teachers of Audio Video System Planning and Installation subjects at SMK Negeri 2 Solok. The data obtained will then be analysed and used to revise the interactive learning media developed. The material expert questionnaire instrument lattice is presented in Table II [18].

TABLE II
MATERIAL EXPERT QUESTIONNAIRE INSTRUMENT LATTICE

No.	Aspects	Indicators
1	Material	a. Material is relevant to learners' competencies b. Clarity of material presented c. The order of the material d. Cognitive developmental appropriateness and learner difficulty level e. Practice questions according to competence f. Appropriateness of material and learners' needs g. Completeness of material h. Appropriateness of providing material examples
2	Language	a. Informational and communicative language b. Appropriateness of cognitive level with language
3	Visualisation	a. Images according to the material b. Video according to the material
3	Evaluation	a. Questions are appropriate to the material presented b. Appropriateness of answer key c. Questions are customised to the learners' ability level

2) Media Expert Validation: Validation by media experts is a correction stage carried out by media experts to obtain data in the form of media feasibility in terms of media quality and appearance of the designed media. Validation by media experts was carried out by 2 people, namely, FT-UNP Electronics Engineering Lecturers and teachers of Audio Video System Planning and Installation subjects at SMK Negeri 2 Solok. The data obtained will then be analysed and used to revise the interactive learning media developed. The following is a lattice of media expert questionnaire instruments presented in Table III [18].

TABLE III
MEDIA EXPERT QUESTIONNAIRE INSTRUMENT LATTICE

No.	Aspect	Indicator
1	Components of interactive multimedia	a. Attractiveness of the opening display b. The suitability of the title with the content of interactive multimedia c. Clarity of instructions d. Completeness of interactive multimedia identity e. Attractiveness of interactive multimedia design
2	Display organisation	a. Ease of use of buttons b. Easy to read font and size c. Attractive colour display design d. Appropriate and attractive layout e. Interesting song arrangement
3	Interactivity	a. Language is interesting and easy to understand b. Its use involves learners
4	Overall assessment	a. The ability of interactive multimedia to attract learners' attention b. The ability of interactive multimedia as a learning resource c. The capabilities of interactive multimedia are tailored to the needs of learners.

The research instrument used is a validation questionnaire that will be given to material experts and media experts. After the questionnaire data is obtained, the data will then be used to determine the validity of the media that has been designed. The material expert instrument is in the form of a questionnaire or material expert assessment of the truth of the material in the learning media. The media expert instrument is in the form of a questionnaire or media expert assessment related to the quality of the learning media designed. Determination of media feasibility using a Likert scale, in accordance with the guidelines contained in Table IV[19]

TABLE IV
VALIDATION SCORE CRITERIA

Score	Category
5	Very good
4	Good
3	Less good
2	Not good
1	Very unfavourable

The data analysis technique in this research is descriptive analysis, namely by calculating the percentage value of the validation results. The data analysis technique in this study is

to calculate the percentage value of the validation results using the validity formula[20] as follows:

$$\text{Eligibility (\%)} = \frac{\text{score earned}}{\text{expected score}} \text{ X } 100\%$$

The feasibility of learning media research results can be seen based on the percentage score. The greater the percentage of scores that analyse the data, the higher the level of feasibility of the media. The criteria for making learning media validation decisions can be seen in Table V[21] .

TABLE III
PERCENTAGE OF VALIDITY CRITERIA

Score	Category
0% - 25%	Very Invalid
25,01% - 50%	Invalid
50,01% - 75%	Fairly Valid
75,01% - 100%	Very Valid

B. Practicality Stage

The practicality stage of interactive learning media is carried out after the product is revised according to the improvements or suggestions that have been given by the validator. [22]. In this study, the practicality is seen by conducting a limited trial on 15 students, then the practicality value of interactive learning media can be seen using a questionnaire that has been filled in by students. The indicators of the practicality of interactive learning media that can be seen in Table VI [23].

TABLE VI
PRACTICALITY QUESTIONNAIRE GRID

No.	Aspects	Indicators
1	Interest	a. Media display that interests students b. Media increases students' learning motivation c. Media supports learners' understanding
2	Material	a. The problems that are raised provide more understanding of the material b. The material presented is easy to understand c. The use of videos supports understanding of the material
3	Linguistics	a. Use of language that is easy to understand b. Use of fonts and sizes that are easy to read c. Proper use of spaces and punctuation in sentences
4	Technical	a. Media can be used easily b. The media used is practical
5	Visual	a. The videos or images used are interesting b. The use of images in the media supports learning c. High-quality sound and picture in videos
6	Evaluation	a. Question quality

The observed value is an assessment made by 15 students majoring in Electronic Engineering at SMK Negeri 2 Solok through filling out a questionnaire. Percentage calculations are carried out to determine the status of the aspects measured and the results are presented in percentage form. This media feasibility assessment uses a Likert scale, in accordance with the provisions listed in Table VII.[19].

TABLE VII
PRODUCT PRACTICALITY SCALE

Score	Category
5	Very good
4	Good
3	Less good
2	Not good
1	Very unfavourable

The data analysis method applied in this research is descriptive analysis, which involves calculating the percentage of the practicality results.

$$\text{Percentage} = \frac{\text{score earned}}{\text{maximum score}} \text{ X } 100\%$$

The feasibility level of the development product is measured through a percentage score. The decision-making criteria in the practicality of this learning media are contained in Table VIII[21].

TABLE VIII
PERCENTAGE OF PRACTICALITY CRITERIA

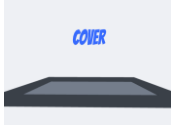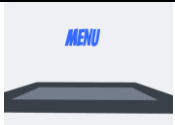| Score	Category
0% - 25%	Not Very Practical
25,01% - 50%	Not Practical
50,01% - 75%	Practical enough
75,01% - 100%	Very Practical

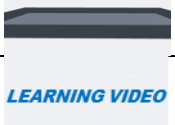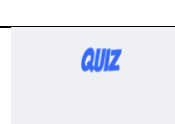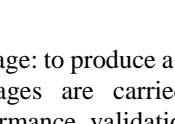## III. RESULTS AND DISCUSSION

A. Media Creation Results

The making of this learning media refers to the 4-D development procedure, namely Define, Design, Develop, and Disseminate.

1) Define Stage: The Define stage aims to establish and define learning requirements and also to gather information related to the product to be developed. Where at this stage the analysis is carried out, namely, initial analysis, analysis of learning media, analysis of PISAV subjects and analysis of learning models.

2) Stage Design: At this stage the design of AR-based learning media that has been determined is carried out. The media design that will be made is tailored to the needs of students, namely an attractive learning media material, with the quality of displays and menus that are not boring, and also the design of this learning media is also adjusted to the model and learning material that will be assisted by this AR-based learning media. In designing a learning media, a storyboard is needed. This storyboard is useful for seeing the learning media model that will be designed. In designing learning media this time a Storyboard of AR-based learning media is made, the AR-based learning media Storyboard is made as follows in table IX

TABLE IX
LEARNING MEDIA STORYBOARD

Name	Show	Contents
COVER		On the cover there is the name of the media, the name of the material, and there is a menu button to go to the menu display.
MENU		The menu display contains the menu in the designed learning media.
MATERIALS		Display material, contains about the material in the PISAV element.
LEARNING VIDEO		Learning videos are useful to help learners in understanding more details about the material presented.
QUIZ		Quiz view, contains questions related to material on PISAV subjects.

3) Development stage: to produce a valid and practical product, several further stages are carried out including product development, performance, validation, and revision.

a. Product Development

Product development is the process of making the embodiment of the design stage into a product that can be used. The following are parts of the learning media that have been developed into products that are ready for use.

1. Cover

The cover contains the identity of learning media such as: media name, material name, material information assisted by learning media. On the cover there is also a logo of Padang State University (UNP), in order to increase the interest of students in studying the contents of the Media.Display cover can be seen in the picture.

Fig 1. Cover View

2. Instructions for Use Button

In the instructions for use menu, it will be explained what buttons are used in the designed learning media, along with their functions so that the use of learning media does not complicate students.

Fig 2. Menu display of button usage instructions

3. Main Menu

The main menu display contains the menu in the designed learning media, such as: CP information, material menu, and quiz menu. The menu also contains directions in the use of learning media in the form of audio.
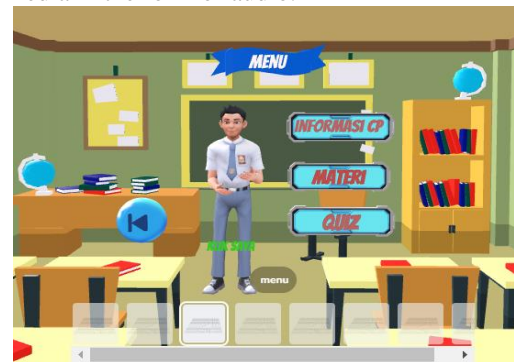

Fig 3. Main Menu Display

4. CP Explanation

On the CP explanation menu, it will explain the learning outcomes, Learning Objectives, and Learning Objective Flow used in the learning media design.

Fig 4. CP Explanation Menu Display

5. Learning Materials

The material menu contains an explanation of the material presented with the learning media. The material used is the material in ATP 3.1.1, namely Explaining acoustic principles and human perception of sound using their own words critically, where the material chosen to make learning media is material about the anatomy of the human ear and the process of hearing in humans, which is also assisted by relevant learning videos.
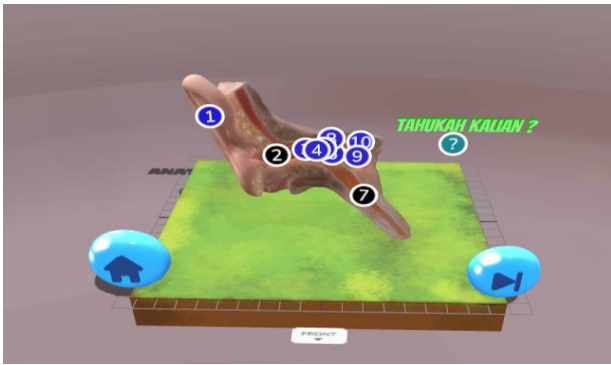
Fig 5. Display of ATP Material 3.1.1

While in the ATP 3.1.2 material, namely, Carrying out simulation analyses of sound wave characteristics with full responsibility about sound wave elements (frequency, amplitude, waves, sound pressure).

Fig 6. Display of ATP Material 3.1.2

6. Quiz

On the quiz menu we will do a quiz according to the material that has been explained previously. This quiz menu is equipped with a start button.
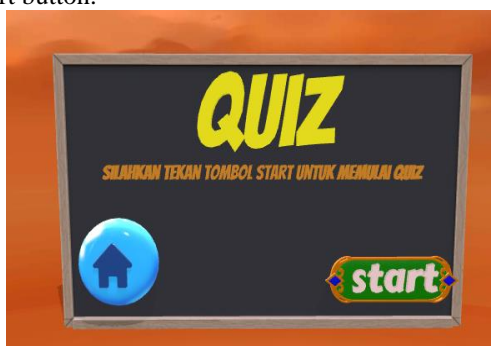

Fig 7. Quiz Menu Display

If we press the start button, we will be redirected to the quizizz platform which contains questions related to the material on PISAV learning, where this quiz aims as a formative assessment that assesses the learning process.
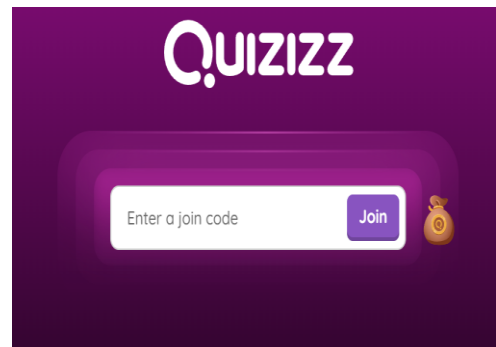

Fig 8. Quiz View

b.   Performance

At this stage the media that has been designed, developed into learning media that is ready to be validated by media experts and material experts. Before the learning media is reviewed by media experts and material experts, trials are carried out by supervisors and researchers. After the learning media developed has passed the trial by the supervisor and researcher, the next stage is validation by media experts and material experts.

c.   Validation

Validation by media experts and material experts is useful to determine the feasibility of learning media made and get suggestions for improvement / revision.

1.   Validation by Media Expert

Validation by media experts was carried out by 2 people, namely, Lecturer in Electronic Engineering FT-UNP and teachers of Audio Video System Planning and Installation subjects of SMK Negeri 2 Solok. Validation by media experts on 4 aspects which include components, appearance, interactive and assessment.

The total score of validator 1 on all aspects is 69 with a percentage of 92% and the total score of validator 2 is 71 with a percentage of 94.7%. The average score obtained from the assessment of 2 validators on all aspects is 70 with a percentage of 93.3%. Where the average percentage of the results of the assessment of 2 validators is in the score range of 75.01%-100% which is included in the "Very Valid" category.

2.   Validation by Material Expert

Validation by material experts was carried out by 2 people, namely, FT-UNP Electronics Engineering Lecturer and Electronics Engineering teacher of SMK Negeri 2 Solok. The aspects assessed are aspects of content feasibility, language, visualisation, and evaluation questions.

The total score of validator 1 on all aspects is 67 with a percentage of 89.3% and the total score of validator 2 is 71 with a percentage of 94.7%. The average score obtained from the assessment of 2 validators on all aspects is 69 with a percentage of 92%. Where the average percentage of the results of the assessment of 2 validators is in the score range of 75.01%-100% which is included in the "Very Valid" category.

d.   Revised

Revision is the stage of improving learning media based on suggestions and input from media experts and material experts obtained at the expert validation stage.

4) Disseminate Stage: In the disseminate stage, the learning media is disseminated and then the practicality test is carried out. Practicality test activities are stages of activities carried out by giving learning media that have been made to students with the aim of knowing the level of feasibility of learning media that has been used by respondents (students). Where the practicality trial was conducted by 15 students of class XI TAV in the Electronics Engineering department of SMK Negeri 2 Solok.

After the practicality test was carried out, the results obtained were, from the total score of the statements of 15 students on the aspect of interest was 205 with a percentage of 91.1%. From the material aspect the total score is 198 with a percentage of 88%. From the linguistic aspect the total score is 199 with a percentage of 88.4%. From the technical aspect, the total score is 133 with a percentage of 88.7%. From the visual aspect the total score is 204 with a percentage of 90.7%. And from the evaluation aspect the total score is 66 with a percentage of 88%. From the data on the results of the trial to 15 students is 89.3% and is in the score range of 75.01% - 100% which is included in the very practical category. The total average percentage obtained from the students' assessment of all aspects is 89.1% and can be categorised as "Very Practical".

B. Discussion

Based on the results of the research described above, it can be seen that at the stage of designing Augmented Reality-Based Interactive Learning Media on Learning Planning and Installation of Audio Video Systems in Class XI TAV SMK Negeri 2 Solok is in accordance with the stages of development with the 4D model. The stages in question are (define), (design), (development), and disseminating (disseminate).

This media development starts from the defining stage, which is to determine and determine various information related to the learning media to be designed. In this defining stage, analyses are carried out, namely, initial analysis, analysis of learning media, analysis of PISAV subjects, and analysis of learning models.

The next stage in the research is the design stage of learning media. The media design that will be made is tailored to the needs of students, namely an attractive learning media material, with quality displays and menus that are not boring, and also the design of this learning media is also adjusted to the model and learning material in the curriculum applied at SMK Negeri 2 Solok.

Next is the development stage, at this stage the designed media reaches its final form after going through a revision process based on feedback from the validation results. Validation for the designed media was carried out by 4 validators, namely 2 media expert validators and 2 material expert validators.Learning media development based on the results of material expert and media expert validation of the product, where the material validation score is obtained from 2 material expert validators.

The total score of validator 1 on all aspects is 67 with a percentage of 89.3% and the total score of validator 2 is 71 with a percentage of 94.7%. The average score obtained from the assessment of 2 validators on all aspects is 69 with a percentage

of 92%. Where the average percentage of the results of the assessment of 2 validators is in the score range of 75.01%-100% which is included in the "Very Valid" category. Based on the assessment that has been carried out by the two material experts, it can be concluded that the learning media that has been made is very adequate and suitable for learning objectives, and in accordance with the flow of learning objectives that have been determined to be used in the learning process.

Meanwhile, in the media expert assessment, the scores of media validation results from 2 media expert validators were seen. The total score of validator 1 on all aspects is 69 with a percentage of 92% and the total score of validator 2 is 71 with a percentage of 94.7%. The average score obtained from the assessment of 2 validators on all aspects is 70 with a percentage of 93.3%. Where the average percentage of the assessment results of 2 validators is in the score range of 75.01%-100% which is included in the "Very Valid" category. Based on the assessment that has been carried out by the two media experts, it can be concluded that the learning media that has been made is very adequate and suitable for learning objectives, and in accordance with the learning flow that has been determined to be used in the learning process.

After the development stage, the next stage is the disseminate stage. At the dissemination stage, the learning media is distributed and then the practicality test is carried out. Practicality test activities are stages of activities carried out by giving learning media that have been made to users (students) with the aim of knowing the level of feasibility of learning media that has been used by respondents or students. Where the respondents in the practicality test were 15 students of class XI TAV SMK Negeri 2 Solok.

From the total score of the statements of 15 students on the aspect of interest is 205 with a percentage of 91.1%. From the material aspect, the total score is 198 with a percentage of 88%. From the linguistic aspect the total score is 199 with a percentage of 88.4%. From the technical aspect, the total score is 133 with a percentage of 88.7%. From the visual aspect the total score is 204 with a percentage of 90.7%. And from the evaluation aspect the total score is 66 with a percentage of 88%. From the data on the results of the trial to 15 students is 89.3% and is in the score range of 75.01% - 100% which is included in the very practical category. The total average percentage obtained from the students' assessment of all aspects is 89.1% and can be categorised as "Very Practical".

As a comparison, there are several other studies that are relevant to this research, namely, a study entitled "Development of 3D Media of Human Hearing Senses Material with Augmented Reality Assemblr Edu" written by Hikmah et al [14]. This study aims to analyse the needs, analyse the feasibility and effectiveness of 3D learning media of human hearing sense material with Augmented Reality Assemblr Edu for grade IV MI students in KKG MI, Sedan District, Rembang Regency. Based on the results of the t test, it is found that t count> t table, namely 17.647> 1.669, it can be concluded that there is a significant difference between the experimental group and the control group so that the 3D learning media of human hearing sense material with Augmented Reality Assemblr Edu is effective in improving the understanding of grade IV MI students in KKG MI Sedan District, Rembang Regency.

In addition, a study entitled "The Effectiveness of Assemblr Edu Digital Learning Media Application in Mathematics Subjects at SMK Negeri 4 Denpasar" written by Rissa et al [11]. The study aims to devote the development that intends to the effectiveness of the application of Assemblr Edu digital learning media in mathematics subjects at SMK Negeri 4 Denpasar. The questionnaire technique test shows that overall when summed up that the category of agree statements has reached 73.2%, meaning that overall the effectiveness of the application has been running properly.

Learning media that has been made can help teachers in learning, which is in line with Zuliansyah's research [24], the use of media can help teachers in innovative teaching methods and attract students in the learning process. Teachers are not only helped by the existence of learning media, teachers can also make learning more interactive and also foster students' interest in learning where this is in line with the research of Monita et al [25], teachers can make learning media that is fun interactive, and easy to use and the use of learning media based on Augmented Reality learning is proven to be able to increase students' interest in learning.

Thus, in the development research that has been carried out, it is concluded that the Design of Interactive Learning Media Based on Augmented Reality in the Subject of Planning and Installation of Audio Video Systems in Class XI TAV SMK Negeri 2 Solok is proven to be valid and practical to use. So this shows that the application of Augmented Reality-based interactive learning media is very good and feasible to use as one of the innovations in the learning process so that learning becomes more interesting and can fulfil students' information sources to understand the material being studied.

IV. CONCLUSIONS

A. Conclusion

Based on the results of the study, it can be concluded that the interactive learning media in the subject of Audio Video System Planning and Installation produced is suitable for use. This can be seen from the results of validation by material experts obtaining an overall percentage value of 92% with the description "Very Valid". Validation by media experts obtained an overall percentage value of 93.3% with the description "Very Valid". The results of the practicality test or user trial by students obtained an overall percentage value of 89.3% with the description "Very Practical". Thus this learning media is declared "Very Valid" and "Very Practical". In addition, the media produced is able to attract the attention of students and increase student learning motivation.

B. Suggestion

Based on the results of research and making interactive learning media that researchers have done. This learning media is expected to be used by teachers in PISAV learning so that the learning media used is more varied not only limited to books or ppt. This learning media can be used by students both in the classroom and outside the classroom in the presence or absence of the teacher. More in-depth adjustment is needed when using Augmented reality-based learning media using the Application

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