Development of Interactive Learning Media using Autoplay Studio 8 for Hydrocarbon Material of Class XI Senior High School

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ABSTRACT

Improving the quality of education can take advantage of technology that is currently increasingly advanced. The expected result, the education world is no longer awkward in using technology to improve its quality. One of the lessons that requires learning media technology is chemistry. This study aims to develop interactive learning media using Autoplay Studio 8 for Hydrocarbon material and conducting some tests to determine the response of educators and students as well. The media created were tested, including testing the feasibility based on expert validation and the responses of educators and students to the developed media. The research method used in the development of instructional media that used a research and development (R&D) approach. Overall the interactive learning media Autoplay Studio 8 developed was declared valid by a validator consisting of three material experts and three media experts with an average percentage value of media experts being 94.15%, and an average percentage of material experts 93 7%. The response of chemistry teachers and students with an average percentage score was 94.6% and 92.33% categorized as very practical. It can be concluded that media is ready to use in the real learning process.

1. Introduction

The era of globalization and openness has changed the face of the world in various aspects of people's lives. The free flow of information and various resources in an environment of cross-country interaction has brought about tremendous changes that have never happened before. Increasing human resources, especially in Indonesia through improving the quality of education in

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accordance with developments in the 21st century (Jannah et al., 2019). Improving the quality of education in the 21st century is capable of producing dignified human beings and competing with other countries. Improving the quality of education can take advantage of technology that is currently increasingly advanced, so that the education world is no longer awkward in using technology to improve its quality (BSNP, 2010).

The competitiveness of a country no longer lies in its natural resources, but lies in human resources in the form of the knowledge and skills it possesses. In accordance with the characteristics of 21st century development, that the development of technology, information and the internet (ICT) throughout the country, so that there is no longer a limiting space in exploring knowledge in order to increase human resources (Roza et al., 2017). Increasing human resources is through education. Education as a central source of knowledge must also follow current technological developments in accordance with developments in the 21st century (Hendripides et al., 2018), influenced by the development of TechnoScience, which was triggered by advances in the world of computers, information and communication technology, and the internet (Istiqlal, 2016) .

The method used in the development of education is by utilizing technology and computers in the learning process by using learning media so as to develop the potential of students. Potential learners can be developed depending on the ability of teachers to manage learning in class, so that difficult material in school subjects especially chemistry, teachers are able to convey easily and can be understood by students (Kwen, 2015). Utilization of multimedia technology as an interactive learning method, is one of the learning tools for students, has several basic strengths, as stated by Phillips, namely: (1) Mixed. Combine text (blackboard), audio, video, which if separated will require more media. (2) User control. Ease of use (3) Simulation and visualization. Users will get information that is more real than information that is abstract. (4) Different learning styles (Albar, 2017).

Interactive learning is supported by interactive teaching materials. Edgar Dale's said that, "One of the interactive teaching materials that can support interactive learning is interactive media which is a combination of two or more media (audio, text, graphics, images, animation, and video) which is manipulated by users to control the commands or natural behavior of a presentation" (Novitasari, 2016). Interactive media can be used for material that requires concrete and clear explanations. In accordance with the basic strength of interactive learning media, namely simulation and visualization, where users will get more real information from information that is abstract. One of the material that requires an explanation of abstract concepts becomes clearer is the subject of chemistry.

Chemistry lessons are related to the composition, structure and properties, changes, dynamics, and energetics of substances, all of which are material that cannot be observed directly by the five senses, so often chemistry lessons are considered abstract by students. Especially in hydrocarbon material. Based on the results of research conducted by Hidayah et al. (2015), students still have difficulty in answering questions that require the ability to understand concepts,

this is because students consider hydrocarbons as compounds composed of carbon atoms rather than carbon atoms and hydrogen atoms. The ability to understand the concepts of students in the category lacks the indicators for naming hydrocarbons, classifying hydrocarbon compounds and describing the structure of hydrocarbon compounds. Because all material on hydrocarbons is abstract material and there needs to be a concrete explanation in explaining the material using video and animation that can illustrate the structure of 3D hydrocarbon compounds and the reaction-reaction processes that occur in hydrocarbon compounds. In accordance with the results of the study by Ernawati et al. (2017), titled The Development Of Monograph With 3-Dimentional Illustrations Titled "Aumented Chemistry: Hydrocarbon" As Learning enrichment Materials, shows 3D objects can display images and text in a single unit that can visualize Hydrocarbon compounds become more real and clear.

Based on interviews with the MAN 1 Pekanbaru chemistry teacher, that in learning the teacher still uses Powerpoint media. In the learning process in the class, only students who sit in front of them pay attention to the material while the students in the back do not pay attention to the material described in front through the powerpoint media. So learning is only centered on the teacher. When given practice questions, many students cannot answer the questions. Because students' abilities are different. So many students do not achieve the expected minimum completeness. Therefore we need an interactive media that can combine material in the form of text, images, videos and animations in one interactive learning media package.

Interactive learning media that can support all forms of media such as writing, images, videos and animation is interactive media Autoplay Studio 8. Interactive media Autoplay Studio 8 is a multimedia technology that has the appropriate media criteria that can combine text, graphics, images, photos, animations , flash, audio and video so that it can visualize abstract chemical concepts, be able to attract the attention of students, easy to use, because in making Autoplay media media Studio 8 is not as complicated as the script-based applications with programming languages.

The results of research on the development of Interactive Multimedia Autoplay Media Studio 8 have been carried out by Shubhi et al. (2015) on the Water turbine material in the X grade machining engineering expertise program at the national Vocational School of Malang showing that the results of the validation of autoplay application learning media were declared to be very valid, with details of the validation of media experts (88.16%) was declared valid, the validation of material experts (90.68%) was declared valid.

The purpose of this study is to develop interactive learning media using the Autoplay Studio 8 application on Hydrocarbon material, analyze the validity and practicality of the media using the Autoplay Studio 8 application on the Hydrocarbon material developed.

2.   Methodology

This study used a research and development (R&D) approach, which is research used to produce certain products and test the effectiveness of these products (Sugiyono, 2013). The product in this study is the interactive learning media using Autoplay Studio 8 on hydrocarbon material. Learning media development refers to the Plomp model which consists of 3 development phases, namely, the preliminary investigation phase, the prototyping phase and the assessment phase (Figure 1).
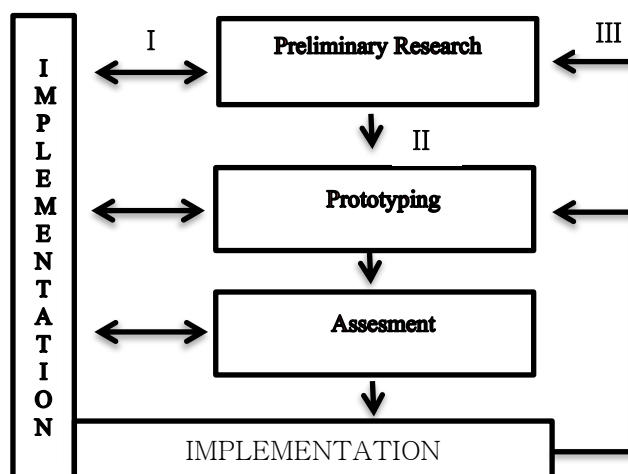

Figure 1. Flowchart of Plomp Development Phase Flowchart

This research was conducted in Pekanbaru City, Riau Province. The research sample consisted of 30 students from MAN 1 Pekanbaru, SMA 15 Pekanbaru, and IT Senior High School Fadillah Pekanbaru. Data collection techniques used in this study were to determine the validity of interactive media that was developed based on the validation of media experts and material experts, bound by an assessment questionnaire filled out by the validator. Where the validation assessment criteria are illustrated in Table 1 (Sugiyono, 2013).

Table 1 Validation Eligibility Criteria

Criteria	Score
Very good	5
Well	4
Pretty good	3
Less	2
Very less	1

The media is declared valid and feasible to use if the average validator's assessment is categorized as valid. Criteria in making decisions for validation sheets can be seen in Table 2 (Riduwan, 2012).

Table 2 Criteria for Assessing Data Percentage of Product Validity

Persentase	Information
80,00-100%	Valid / Eligible
60,00-79,99%	Fairly Valid / Fair enough
50,00-59,99%	Invalid / Inadequate
0-49,99%	Invalid / Ineligible (Replaced)

The next step was to analyze data about the practicality of Autoplay studio 8 interactive learning media. Practicality assessment was carried out after the media is declared valid by the validator. Practical assessment was assessed by subject teachers by filling out an assessment questionnaire. The average score from the teacher response questionnaire that has been obtained is then converted into a qualitative data form. The practicality criteria for using Autoplay Studio 8 learning media can be seen in Table 3.

Table 3. Criteria for Eligibility for Teacher Response Questionnaire

No.	Interval	Criteria
1	81-100%	Very good / very practical
2	61-80%	Good / practical
3	41-60%	Good enough / Practical enough
4	21-40%	Not good / Not Practical
5	0-20%	Not good / not practical

Student response questionnaire assessment was conducted to measure the attractiveness of media products based on students' responses to the use of Autoplay Studio 8 learning media products in the learning process. This student response questionnaire was measured using the Guttman scale which consisted of two answer choices namely "Yes" or "No". The assessment criteria can be seen in Table 4.

Table 4. Percentage Criteria for Product Withdrawal

Persentase	Information
81-100%	Interesting / good
60-79%	Pretty interesting / good enough
50-59%	Less attractive / not good
< 49%	Not interesting / not good

3. Results and Discussion

This development research resulted an Autoplay Studio 8 interactive learning media that is producted for high school grade XI in hydrocarbons topic. Learning media development refers to the Plomp model which consists of 3 phases:

Preliminary Investigation Phase

In this phase the researcher collects, identifies and analyzes data or information about students' understanding of concepts in hydrocarbon material, the media used

in learning that is applied to hydrocarbon materials and teaching materials used by students. In this phase, problem analysis, teaching material analysis, student analysis and curriculum analysis are carried out.

Based on data obtained from interviews, it is found in the study of hydrocarbons that students have difficulty in naming hydrocarbon compounds, isomers and reactions of hydrocarbon compounds. In line with that research conducted by Hidayah et al. (2015) entitled Description of students understanding of concepts hydrocarbons shows that students' understanding of the concept of hydrocarbon material categories is very lacking in the indicators for naming alkanes, alkenes and alkenes, describing the structure of alkalo, the concept of isomers, because all students only understand one type of isomer and the reaction of alkane, alkene and alkyne compounds. The results of interviews with chemistry teachers at MAN 1 Pekanbaru at the pre-research stage, it is known that in learning activities at MAN 1 Pekanbaru use the 2013 curriculum, so learning chemistry in the classroom is guided by Basic Competence (KD) which refers to the Core Competencies (KI) quoted from the Regulations Minister of Education and Culture of the Republic of Indonesia Number 37 of 2018 concerning Core Competencies and Basic Competencies of lessons in the 2013 Curriculum.

The material chosen in this research development is Hydrocarbons. Material analysis is carried out by identifying the main parts of the hydrocarbon base material based on the 2013 revised in 2017 curriculum. The subject matter of hydrocarbons is divided into sub-materials, namely: carbon compounds, hydrocarbons, isomers and properties of hydrocarbons.

Prototyping Phase

1. Design Stage
The initial design of the media is to form of determining the main menu in learning media. The main menu consists of the media, instructions for use, competencies, materials, compiler profiles, references, and evaluations. Subsequently, choose the theme, layout and basic background of the appropriate learning media. Searching for content from learning media by collecting various supporting materials for making media for hydrocarbons such as references from high school and university chemistry books, images, audio, video, animation and flash that are compatible with hydrocarbon material, then making StoryBoard.

2. The manufacturing stage
At the initial product manufacturing stage, the following steps were carried out:
   a. Creating a video opening and opening page, made the initial page (Home) by entering the main layout and background design and making the main menu button that is given Hyperlink.
   b. Arranging instructional media in accordance with the characteristics of the material for 4 meetings based on competency indicators in accordance with the 2013 curriculum in revised 2017 curriculum and is equipped with images, audio, video, animation and flash that support the material. At the first meeting contains sub material about identifying carbon compounds

and carbon atoms. The second meeting contained submateri structure and nomenclature of hydrocarbon compounds. The third meeting contains submateriations of physical properties and isomerism of hydrocarbon compounds. The fourth meeting contains submateri reactions of hydrocarbon compounds. The following is an example display of several pages of Autoplay Studio 8 interactive media can be seen in Figure 1, Figure 2, Figure 3.
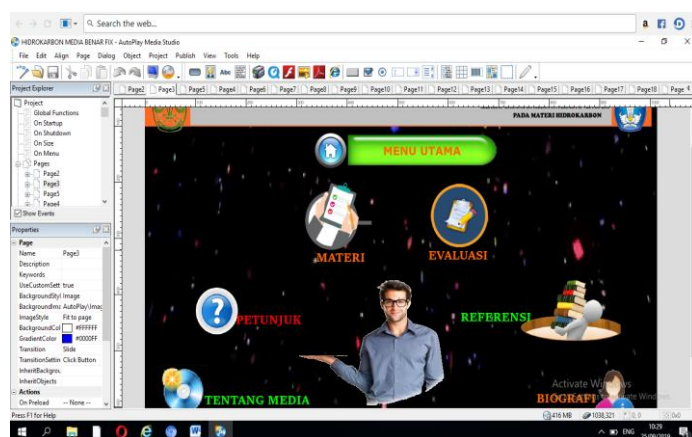

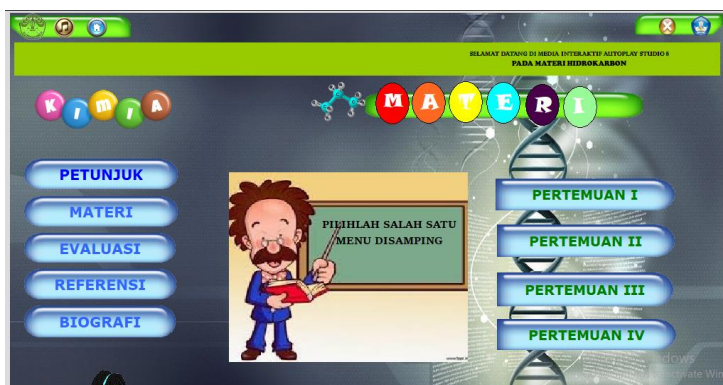Figure 1. Display the Autoplay Studio 8 work page

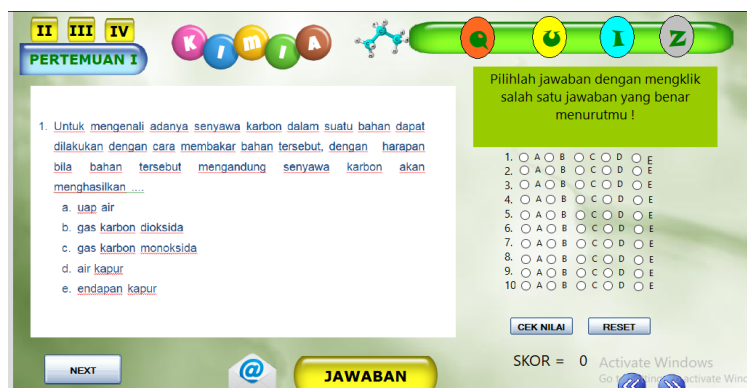Figure 2. Display of Autoplay Studio 8 Teaching Material Page

Figure 3. Autoplay Studio Quiz Page Display 8

The instrument used in the form of a validation sheet along with its elaboration, questionnaire responses of teachers and students. The validation of the media by each validator is carried out twice, until the media are said to be valid. In the first validation, many validators provide input and suggestions for improvement. The following suggestions and input for improvement and follow-up from each validator are presented in Table 5 and Table 6.

Table 5. Suggestions and Inputs and follow-up from Media Experts

Validator	Suggestions and Feedback	Follow Up / Repair
Validator 1	- There are still some buttons that do not work yet - There are some pages that seem empty and some are meeting - There is writing that is still messy when the media is enlarged - The transition time between pages on the opening page is too long	- Improvements to the buttons on the *quick action* in the *button* menu. - The page is set on tightly written posts. - Text settings in the attribute menu in *Auto-Resize.* - Shorter transition times.
Validator 2	- Add all meetings button on each page. - Layout and layout of the image is less proportional	- Made all button meetings on each page. - Layout settings on the page and image layout
Validator 3	- The display of questions on the Quiz is replaced with a slide show - You need a "click" sign to start the animation video so it doesn't open directly	- Quiz questions are replaced with *Slide show* forms - The video play setting is changed to "Loop" (if clicked "play" just opens.

Table 6. Suggestions and Inputs and Follow-Up Expert Material

Validator	Suggestions and Feedback	Follow-up
Validator 1	- Explain the editor about the description of termites in producing ethanol - Do not give numbers to alkuna	- Adding editorial sentences to information about termites. - Erases numbers on alkaline compounds
Validator 2	- Some texts on the media need to be enlarged - Added a link to the chemical web site especially Hydrocarbons to find even more material	- Improvements to changing the format of writing on the media to be more - Added a web address on the media page ie "

Validator 3	• Concerning the structure of hydrocarbon compounds, a short line structure is made. • Material for the structure of hydrocarbon compounds, video shown in 3-dimensional structure	• Corrections change questions from complete structural formulas to short line structures. • Add videos of 3D structure shapes of hydrocarbon compounds

The results of the validation of Autoplay Studio 8 media on Hydrocarbon media experts are illustrated in Figure 4.
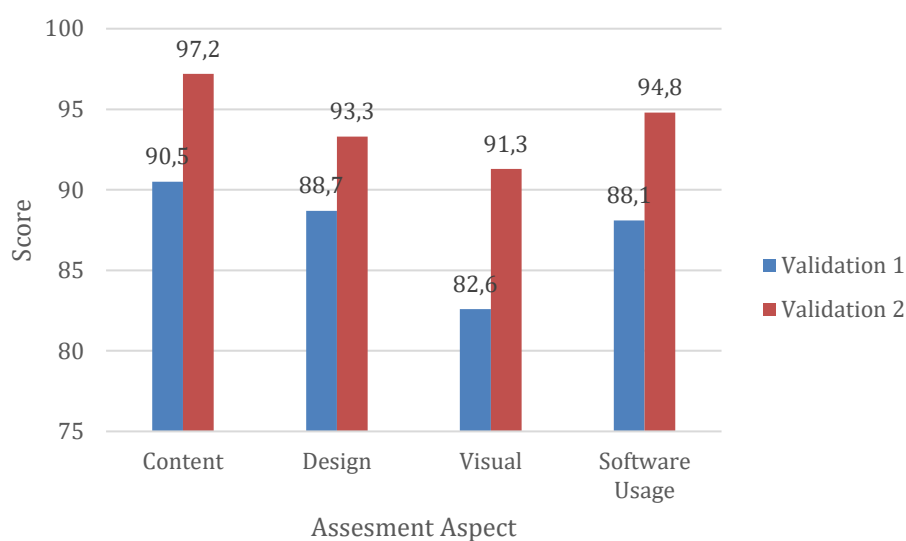

Figure 4. The media expert validation result

In the Figure 4, the graph of the results of the Autoplay Studio 8 media validation on the Hydrocarbon material shows that there are four aspects of media evaluation by three media experts. In the aspect of contents there was an increase in the percentage from 90.5% up to 97.2%. The percentage increase was due to the first validation, the three validators gave many suggestions and input about the media from the aspect of content. The content aspect contains instructions for using the media, completeness of the contents of the media, and display of questions on the media. In the aspect of evaluating the clarity of media usage instructions, in the first validation, the validator provides suggestions for adding buttons to be able to see the tutorial on media usage so that the user can understand more deeply about media use and the button functions contained in the media. Then Display the questions on the media must be easy to read and can be seen directly with the answer choices provided.

Researchers make improvements about the suggestions and input provided by the validator by repairing the media instructions page and adding the Hyperlink button to open pdf files about the Autoplay Studio 8 media and improving page views for questions and answer choices made on one page. After the repairs were made the media was re-validated by the validator and the percentage of the second

validation of the three validator media experts on the content aspect was 97.2% with a valid category.

In the design aspect, there was an increase in percentage, from 88.7% up to 93.3%. The percentage increase was due to the first validation, the three validators gave many suggestions and input about the media from the design aspect. Design aspects include the design of hydrocarbon material in the media. the assessment of aspects of information conveyed in the media is more interesting by adding animated videos to carbon compound identification experiments. Regarding the presentation of the exercise and evaluation, it should be presented more interestingly, by adding a dialog page to the evaluation page and an answer key appears when all questions have been answered.

Improvements were made on the suggestions and input provided by the validator by adding animated video identification of carbon compounds in the form of flash video. Then improve the appearance of the evaluation questions by adding a dialog page and setting the answer key button will appear when all questions have been answered. After the repairs were made the media was re-validated by the validator and the percentage of the second validation of the three validator media experts on the design aspect was 93.3% with a valid category.

In the aspect of appearance (visualization communication) there was an increase in percentage, namely from 82.6% and 91.3%. The percentage increase was due to the first validation, the three validators gave many suggestions and input about the media from the aspect of display (visualization communication). The display aspect (visualization communication) includes about easy access between pages, clarity about images, videos and animations in the media. Suggestions and input validators about the function of buttons are still many that do not work and there are still videos that sound small and the sound is too big.

Researchers made improvements about the suggestions and input provided, then validated again by the validator so that the second validation percentage of the three validator media experts on the aspect of display (visualization communication) was 91.3% with a valid category. Overall, from the four aspects of validation, three media experts were 94.15%. Based on the validation assessment criteria in table 2 are in the range of 80% -100% with valid criteria. So that interactive learning media products can be used as learning media. The results of the validation of Autoplay Studio 8 media on the material Hydrocarbon Expert material are illustrated in in Figure 5.
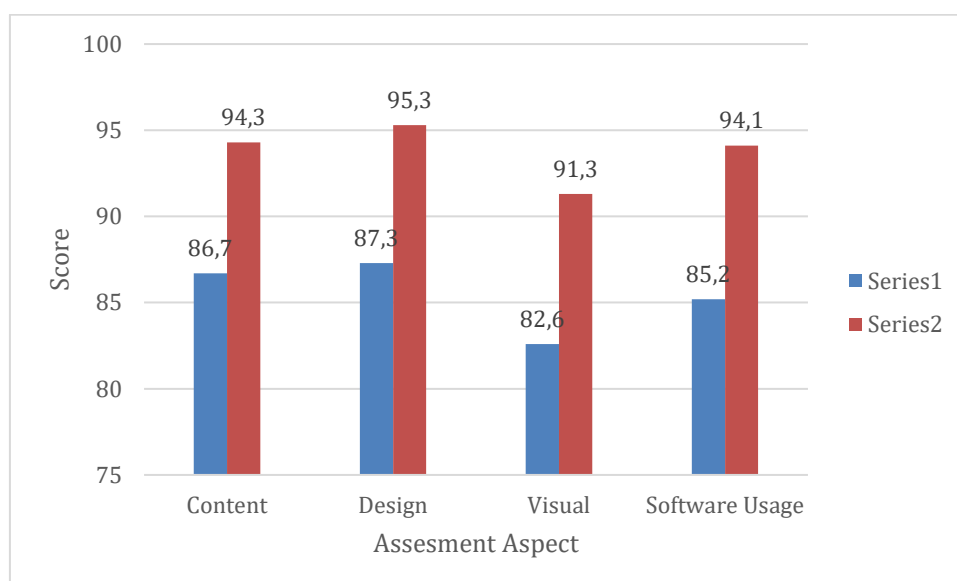
Figure 5. The expert material validation result

In the Figure 5, the validation of Autoplay Studio 8 material on Hydrocarbon material shows that there are four aspects of material assessment. In the aspect of content there is an increase in the percentage from the first validation to the second validation. The increase was due to the many suggestions and input provided by the validator regarding the content of hydrocarbon material in the interactive learning media Autoplay Studio 8. The average percentage of validation in the content aspect from 86.7% rose in the second validation to 94.3%. The average percentage of validation in the design aspect from 87.3% rose in the second validation to 95.3%. The average percentage of validation in the display aspect (Visual communication) from 82.6% rose to 91.3%. The average percentage in the aspect of software utilization from 85.2% rose to 94.1%. Overall, from the four aspects of validation, three material experts were 93.7%. Based on the validation assessment criteria in table 2 are in the range of 80% - 100% with valid criteria. So that interactive learning media products can be used as learning media.

Main Field Trial

Limited trials (small scale) have been done to 4 chemistry teachers and 30 XII grade students in MAN 1 Pekanbaru, SMA 15 Pekanbaru, and Fadillah IT High School. The teacher's limited trial is carried out directly using the interactive learning media Autoplay Studio 8. Then the teacher fills in the teacher's questionnaire consisting of 19 statements assessed by using a Likert scale of 1-5 to see the teacher's response and suggestions and input against the media. Small-scale tests are also conducted on students by looking at students' responses to the media provided. Then the student questionnaire responses were given consisting of 10 questions. To see the practicality of the interactive learning media Autoplay Studio 8 Hydrocarbon material. The following results of the practicality of the media from the teacher and the attractiveness of the students obtained can be seen in Table 7.

Table 7. Limited Try Out Data for Teachers and Students

Respondent	Total score	Average percentage	Category
Teacher	360	94,6%	Very good / very practical
Learners	277	92,33 %	Very good / Very interesting

Based on the results of limited trials to teachers and students, it is obtained an average percentage of 94.6% and 92.33%, respectively. Based on the assessment criteria in tables 3 and 4, the practicality category is in the range of 80% -100% with a very good category. So the Autoplay Studio 8 interactive learning media on Hydrocarbon material can be used in the learning process.

Revision of The Main Field Product Trial

Product revisions are always done after the product is applied or tested. This revision is made especially if there are new suggestions and inputs that have not yet appeared at the design stage. The suggestions and input are then followed up by correcting the media and validating it again until the media is truly valid.

4.   Conclusion

The development of interactive learning media Autoplay Studio 8 was started from the investigation stage, then the prototype stage, and the evaluation stage of the validator. The investigation phase contains about analyzing the needs in making media. The manufacturing phase discusses the design of the media and the making of media that produces prototype I, and then it will be assessed at the evaluation stage. In the assessment stage, the prototype is validated by media experts and material experts. The results of the prototype I validation still need to be revised and produce a prototype II that is categorized as "Valid" both in the media and materially so it is worthy to be tested on a limited basis. Based on the results of limited trials, the Autoplay Studio 8 interactive learning media on Hydrocarbon material, received responses from teachers and students with very good criteria. So that interactive learning media Autoplay Studio 8 Hydrocarbon material can be used in the learning process.

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