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RESEARCH ARTICLE

INTERACTIVE MULTIMEDIA VALIDATION OF INTEGRATED NATURAL SCIENCE WITH THE THEME OF MOTION IN LIFE USING AN INTEGRATED SCIENTIFIC APPROACH TO 21ST CENTURY LEARNING

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Abstract

Learning with interactive multimedia integrated natural science is expected to improve students' 21st-century skills so that it can help students face the challenges of the 21st century.This study aims to determine the validation of the product developed, namely interactive multimedia integrated natural science with the theme of motion in life using an integrated scientific approach to 21st-century learning. Integrated natural science interactive multimedia is assessed from the aspects of the feasibility of content, constructs, graphics, and language. The validation was carried out by three validators. The instrument used was a validation instrument in the form of a questionnaire.The results of the research are interactive multimedia integrated natural science with the theme of motion in life using an integrated scientific approach to 21st century learning with valid criteria so that it can be used by educators in the natural science learning process in schools.

Introduction:-

Education is very important for the progress of the nation and state. Education has an important role in various areas of life. Through education it can produce quality human resources, especially in this 21st century, human resources who can compete in the world, both nationally and internationally, are needed for common advancement.In accordance with the objectives of national education contained in Law Number 20 of 2003 concerning the National Education System, namely education aims to realize the learning process so that students can actively develop their potential, both attitudes, knowledge, and skills.The skills that students in the 21st century must have are communication skills, critical thinking and problem-solving skills, creative thinking and innovation skills, and collaboration skills (Samra&Ratnawulan, 2020). So it is necessary to create education that can apply 4C skills in the learning process (Asrizal et al., 2018).These skills are needed by every human being in facing various challenges in life, especially in the 21st century.

Technology is also experiencing rapid development in the 21st century.Learning that cannot be separated from technological developments is science learning. In the current curriculum, namely the 2013 Curriculum, junior high school natural science learning is taught through integrated natural science learning (Asrizal, Amran, Ananda,

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Festiyed, & Khairani, 2018). Integrated natural science learning is a learning process that studies natural phenomena from the fields of chemistry, physics, and biology which are combined into one inseparable theme that is studied systematically.Some of the themes in Integrated Science lessons are the theme of motion in life (Marshel&Ratnawulan, 2020), the theme of muscles and human skeletal systems (Nurhafifah&Ratnawulan, 2020), the sense of sight and optical tools (Melati et al., 2020), and energy in life (Gusti&Ratnawulan, 2020). The benefits of Integrated Science learning are that it can make learning effective and efficient, and can increase student motivation and interest in studying phenomena that exist in nature (Supriadi et al., 2020; Sarmi et al., 2020).

The government has made efforts to improve the quality of education in Indonesia, including the government's efforts to improve the competence of educators through various trainings (Gusnedi et al., 2019), providing education funding assistance, namely BOS (School Operational Assistance) every year to each school to support various the needs of schools and students, changing the curriculum to the 2013 curriculum so that students can adapt and be able to compete in this 21st century (Weri et al., 2019; Supriadi&Ratnawulan, 2019).

Observations made at SMPN 2 Koto XI Tarusan were not in accordance with expectations, namely the media used in the learning process were not able to present real-world phenomena into learning, had not integrated 21st-century learning,were not able to attract students to learn science, could not train the independence and activeness of students in learning. Similar to the results of the preliminary analysis of the media, in terms of quality of content and objectives, learning, and technical quality are still low (Kurniawati&Ratnawulan, 2020).Initial analysis by Ariani&Ratnawulan (2020), the media used by educators in terms of quality of content and learning is still low. Sarmi et al., (2019) stated from the results of their initial analysis of media, namely the low quality of content in the use of learning media. So that a quality media is needed, can display natural phenomena in real terms and can attract the interest and motivation of students in learning natural science, including interactive multimedia.

Interactive multimedia can increase the interest and motivation of students in learning natural science by displaying phenomena into learning, it can also increase the activeness of students in learning natural science, because interactive multimedia is a combination of various media, namely images, audio, sound, graphics, videos that are made as attractive as possible and can provide feedback so that students can be interested in learning that can be done independently or with the help of teachers.Interactive multimedia developed by applying a scientific approach integrated with 21st century learning can help improve students' 4C skills through steps in the scientific approach.

The steps on the scientific approach contained in Permendikbud No. 103 of 2014, namely: observing, asking, gathering information or trying, associating, and communicating (Kemendikbud, 2014). Learning with a scientific approach can increase the activeness of participants in learning (Lestari et al., 2018). 21st century skills, namely: critical thinking and problem solving skills; communication; collaboration; and creative and innovative (Helfira et al., 2020).By applying the steps in the scientific approach, namely the step of observing and asking questions can train students' critical thinking and problem solving skills as well as creative and innovative thinking; Activities gathering information or conducting experiments, associating, and communicating can train and improve students' collaborative and communication skills.

Based on the previous description, the researcher is interested in developing interactive multimedia Integrated natural science with the theme of motion in life using an integrated scientific approach to 21st century learning. In order for the Integrated Natural Science interactive multimedia developed to be valid, a validation test is carried out on the product being developed.Indicators for testing product validation are seen from 1) aspects of content validation, including the suitability of material with core competencies and indicators, conformity with learning objectives, material truth, benefits, and using an approach that is in accordance with the 2013 curriculum;2) construct validation or presentation feasibility, including clarity of goals to be achieved, motivation, and completeness of information; 3) language validation, including legibility, clarity of information displayed, in accordance with good and correct use of Indonesian, using sentences effectively; 4) and graphic validation to assess the type of font, suitability of letters, layout, attractive or not display design (Depdiknas, 2008).

So, the purpose of this study was to determine the validity of interactive multimedia integrated natural science with the theme of motion in life using an integrated scientific approach to 21st century learning.

Methodes:-

This study used a descriptive research method (Putri et al., 2019). Data obtained from the assessment sheet for the interactive multimedia validity instrument of Integrated natural Science in the form of a questionnaire. The instrument and product validations were assessed by three expertsone practitioner. The validity test aims to determine the validity of the product being developed. Also to find out the advantages and disadvantages of the product being developed (Hidayat et al., 2020). As well as experts who assess products can provide input and suggestions so that the resulting product can be even better. Validation analysis using a Likert scale. Valid criteria can be seen in Table 1.

Table 1:- Validity Criteria.

Number	Achievement Level	Category
1	≥ 0,6	Valid
2	< 0,6	Invalid

From Table 1. it can be seen that if the level of achievement of the product being assessed is≥ 0.6, the product is said to be valid,but if the value is less than 0.6 the product developed is said to be invalid.

Results and Discussion:-

Prior to the validation of interactive multimedia products, first validation of the integrated science interactive multimedia product validation instruments, teachers 'response practicality instruments, and students' response practicality instruments by the validator was conducted. The results can be seen in Table 2.

Table 2:- Results of the Validation Instrument Assessment.

Number	Validated Instruments	Average	Category
1	Interactive multimedia validation instrument	0,86	Valid
2	Practical instrument of educator response	0,94	Valid
3	Practical instrument of student response	0,93	Valid

From Table 2. it can be seen that the results of the assessment of the interactive multimedia validation instrument with an average value of 0.86 with valid criteria, the practicality of the teacher's response instrument with an average value of 0.94 with valid criteria, and the student response practicum instrument with an average value of 0 , 93 with valid criteria. More details can be seen in Figure 1.

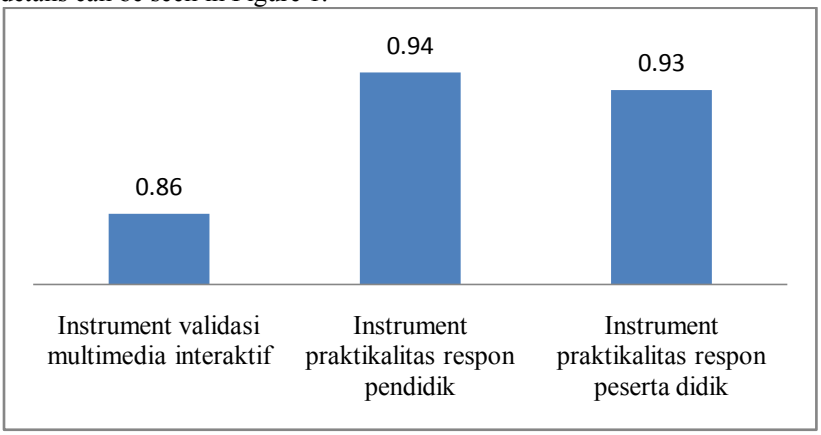

Figure 1:- Results of the Validation Instrument Assessment.

From Figure 1, it can be seen that the overall results of the validation instrument assessment are valid so that the instrument can be used for the next stage. Then, the interactive multimedia validation stage of Integrated Natural Science was carried out by three experts. The results can be seen in Table 3.

Table 3:- Results of Interactive Multimedia Validation Assessment.

Number	Aspect	Validation Value	Category
1	Content Validity	0.83	Valid

2	Construct validity	0.89	Valid
3	Language Validity	0.86	Valid
4	Graphic Validity	0.92	Valid
Average		**0.88**	**Valid**

The results of the interactive multimedia validation evaluation of Integrated Natural Sciences are in Table 3. seen from the content validation aspect with the acquisition of a value of 0.83 valid criteria, the construct validation aspect with a validation value of 0.89 valid criteria,linguistic aspects with a value of 0.86 valid criteria,aspects of graphic validation with a value of 0.92 valid criteria. More details can be seen in Figure 2.

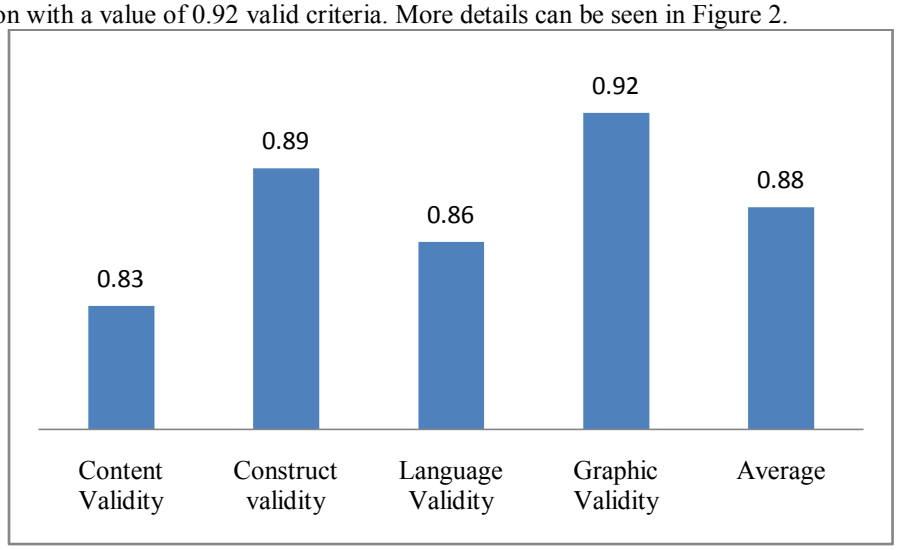

Figure 2:- Results of Interactive Multimedia Validation Assessment.

From Figure 2. It can be seen that the overall results of the integrated natural science interactive multimedia validation assessment with an average value of 0.88 are valid. This is in accordance with the opinion of Azwar (2015), namely that a product is said to be valid if the value obtained is greater than 0.6. So that integrated natural science interactive multimedia products with the theme of motion in life using the integrated scientific approach of 21st-century learning developed can be used in the learning process in schools.

First, from the aspect of content validation, the material in the Integrated Natural Science interactive multimedia is in accordance with the demands of the core competencies, basic competencies, and formulated indicators; the material displayed on the Integrated Natural Science interactive multimedia is in accordance with the learning objectives;Integrated Natural Science interactive multimedia is presented in accordance with the truth of science and in accordance with the theme of motion in life; pictures or illustrations displayed on Integrated Science interactive multimedia relevant to the material description; the material provided can increase the knowledge of students about movement in life; and Integrated Natural Science interactive multimedia presented using steps in a scientific approach.

Second, from the aspect of construct validation, learning objectives in Integrated Natural Science interactive multimedia can be well understood, the evaluation presentation in Integrated Natural Science interactive multimedia can measure the competence of students both by teachers and by students themselves,interactive multimedia presentation of Integrated Natural Science can motivate students in learning, instructions for the use of integrated science interactive multimedia are clear, making it easier for students to use integrated natural science interactive multimedia; The images and videos shown can clarify the learning material.The material presented with illustrations in the form of images or videos can help students understand the learning material(Suswina, 2016).

Third, from language validation, writing on integrated natural science interactive multimedia is easy to read; the language used is simple, straightforward, and does not mean double;Integrated natural science interactive multimedia using enhanced spelling; the language used is communicative or adapted to the stages of student development; use the good and correct language according to Indonesian grammar rules.

Fourth, from the graphic validation, the font type and size in the Integrated Natural Science interactive multimedia can be read clearly; the layout and layout proportionally; image illustrations in accordance with the material provided; IPA Integrated interactive multimedia design is attractive to read;the color combinations in the integrated natural science interactive multimedia are interesting to look at;and the Integrated Science interactive multimedia cover is interesting to see and observe and can attract students to continue to the next page on the Integrated natural Science interactive multimedia being developed. An interesting interactive multimedia presentation can increase the motivation of students in learning (Himmah, 2017).

Conclusion:-

The conclusion of the research results is that the product developed is interactive multimedia integrated natural science with the theme of motion in life using an integrated scientific approach to 21st century learning which has valid criteria so that it can be used by educators and students in learning.

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