

## RESULTS OF VALIDATION OF ELECTRONIC LEARNING MATERIAL FOR NEWTON'S LAW WITH *KVISOFT FLIPBOOK MAKER* FOR CLASS X HIGH SCHOOL STUDENTS

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### ABSTRACT

The 21st century is the century where technology has developed. The use of technology in education is highly demanded in the 21st century. Teachers can maximize the utilization of technology in learning activities by using learning materials that utilize technology. The presence of learning materials that utilize technology can increase the activity of students in learning activities so that they can be done effectively. The fact found in school was that the learning material used by students was still low in the use of technology. This has an impact on student learning outcomes which were still low seen from the average value of the mid-semester test for X Natural Science 1 students, namely 51.67. The alternative solution to overcome this problem in this study is to develop electronic learning material of Newton's law with Kvisoft Flipbook Maker for class X high school students. This research has a purpose namely to know the validity of electronic learning material of Newton's law. The learning material of Newton's law with Kvisoft Flipbook Maker is used as the object in this research which is limited to class X. Research and development is a type of research used in this research. The data collection instrument used was a validity sheet. The research result found from the data analysis was the validation of electronic learning material of Newton's law is in the very good category. The value obtained was 89.43. So, it can be stated that the electronic learning material of Newton's law with Kvisoft Flipbook Maker is valid for use in learning physics for class X high school students.

**Keywords :** *Electronic Learning Material Validity, Newton's Law Material, Kvisoft Flipbook Maker*



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## I. INTRODUCTION

The 21st century is the century of the development of science and technology (IPTEK). The development of science and technology has led to intense competition in various fields of life. Intense competition in the 21st century demands that humans have quality resources. To realize high-quality human resources, the skills of the students are prioritized in the education of the 21st century [1]. One of these resources can be obtained by applying digital skills-based education, so that students are able to access and receive information quickly and responsively, are able to think critically in problem solving, are able to collaborate, are able to interact and communicate well and effectively, and are able to adapt by following developments in the era of digitalization. If all these skills can be mastered, it is hoped that humans will have adequate digital skills so that they can compete in a healthy manner in the 21st century.

Education is required to keep up with the rapid development of technology [2]. Technology contributes to the world of education, especially in learning activities. The world of education that used to be completely manual has now been converted into a digital form that is more effective and efficient. Teachers who previously used printed teaching materials in learning activities, have started to switch to using digital teaching materials.

Teachers are required to be able to adapt to technological developments. Teachers must be able to be innovative, creative, and able to use and develop learning media that are in line with the development of science and technology in the present [3]. Teachers can maximize the use of technology in learning activities in the

classroom. The use of technology in classroom learning activities can help teachers improve the quality and efficiency of learning. The use of technology in learning activities can encourage students to study independently. Teachers can also use technology in making learning devices. Electronic teaching materials are one of the learning tools that can support the success of physics learning activities.

Electronic teaching materials are good for use at this time where technology is developing so rapidly. Electronic teaching materials in their use not only involve the sense of sight but also the sense of hearing of students. The media contained in electronic teaching materials is not only in the form of text and images but also consists of other interesting media such as music, animated photos and videos so that it looks more alive. Electronic teaching materials developed with various interesting media can encourage students to be more active in learning activities.

Practical electronic teaching material for use in learning activities. Electronic teaching materials made can be stored in devices such as HP. Students can easily access the subject matter contained in electronic teaching materials anywhere, even students who cannot come to school can still access and use electronic teaching materials so that they can strengthen their mastery of the subject matter [4].

The actual conditions found are still far from the desired ideal conditions. This is known based on preliminary studies that have been carried out. There are three preliminary studies in this research: first, the average value of the questionnaire distribution to two teachers in the physics learning process is 46.32 with a low category. Second, the average value of using physics teaching materials in online learning is still low at 52.44. Third, data on student learning outcomes for physics subjects obtained the average midterm exam score for the first semester of 51.67. The average value of physics from the three classes shows that the physics value of class X Natural Science SMAN 1 Payakumbuh District is still relatively low.

The reality of the results of the preliminary study does not reflect the expected ideal conditions. This indicates a problem in the research. An alternative solution to overcome the problem in this research is to develop electronic teaching materials for Newton's law materials with Kvisoft Flipbook Maker.

There are several novelties of electronic teaching materials developed. There are two novelties of this teaching material: first, this electronic teaching material is a teaching material that utilizes technology. Students can access electronic teaching materials via smartphones online. Second, this electronic teaching material utilizes the latest version of the Kvisoft Flipbook Maker software so that it is more practical to use in learning.

Starting from the background of the problem that has been described, the researcher wishes to develop electronic teaching materials for Newton's law materials with Kvisoft Flipbook Maker. Learning using electronic teaching materials is expected to be interesting for high school students because it is in accordance with the demands of the 21st century. These electronic teaching materials are expected to be able to hone students' digital skills.

There are several previous studies that are relevant to the research conducted. These relevant studies include the research of Agustina, et al [5], Luthfi, et al [6], Sriwahyuni, et al [7]. The difference between this research and relevant research is that the physics learning materials in electronic teaching materials include KD 3.7 and KD 3.8 materials for class X semester 2. In addition, the use of electronic teaching materials is aimed at increasing the use of technology in classroom learning activities.

Electronic teaching materials as a product in this research have several advantages. The learning materials presented are relevant to the physics learning materials required in the 2013 curriculum. The worksheets in the electronic teaching materials can be used as a guide to conduct virtual experiments using Phet Simulation so as to develop students' skills. Experimental activities need to be carried out in learning physics to understand physical phenomena and their characteristics [8]. These electronic teaching materials are new and interesting teaching materials for students in schools where previously students only used printed teaching materials. Teachers can optimize learning and assessment of students with electronic teaching materials.

Teaching materials are a well-packaged and sequential arrangement of subject matter made for use in learning activities. Teaching materials are one of the main learning materials/sources that can be used by students and teachers in learning activities so that learning takes place effectively and efficiently [9]. Teaching materials are used to facilitate students and teachers in learning activities in the classroom to increase the effectiveness of learning [10]. Teaching materials are made as attractive and complete as possible to increase student enthusiasm in learning activities.

Teachers are expected to be able to choose good teaching materials to stimulate student activity and enthusiasm in learning activities. The characteristics or characteristics of good teaching materials are: 1) teaching materials made can encourage students to study independently 2) teaching materials present complete subject matter, 3) teaching materials can develop students' digital skills 4) teaching materials are arranged on an ongoing basis. Teaching materials that are packaged in such a way can stimulate the enthusiasm of students in learning activities and can be a guide for teachers and students in learning activities.

There are various types of teaching materials that can be used by teachers in learning activities in the classroom, one of which is electronic teaching materials. Electronic teaching materials are teaching materials that are presented in digital form consisting of several media such as text, animation, photos and videos that can be operated through computers that utilize technology and other tools in digital form [11]. Electronic teaching materials are an arrangement of materials that are designed as attractive as possible by displaying the learning objectives to be achieved at the end of the lesson. Electronic teaching materials are prepared and designed to hone students' digital skills in classroom learning activities.

Electronic teaching materials consist of several forms. Electronic teaching materials can be in the form of books displayed in digital form, digital journals and digital magazines that utilize technology in their use. The existence of electronic teaching materials can stimulate the skills of teachers and students in utilizing technology in schools.

Electronic teaching materials consist of several structures. The structure of electronic teaching materials at least includes: identity of teaching materials, KI, KD, indicators of competency achievement, subject matter, sample questions, exercises to hone students' skills, and a bibliography. The assessment components for electronic teaching materials are the content of the subject matter, the learning design used, the visual appearance of the electronic teaching materials, and the software used in designing electronic teaching materials [12].

Electronic teaching materials have several characteristics. Electronic teaching materials are displayed in digital form. Electronic books consist of materials, pictures and videos that can be accessed electronically and can be used on devices such as laptops or gadgets [13]. Electronic teaching materials consist of various interesting media such as writing, animation, photos, and audio. These teaching materials can be saved in various formats such as pdf, html, jpeg, exe, etc.

Electronic teaching materials have advantages and disadvantages. The disadvantages of electronic teaching materials include: 1) the size of electronic teaching materials is usually smaller than printed teaching materials, 2) electronic teaching materials sometimes require an internet connection to operate. Interesting electronic teaching materials are applied in classroom learning activities.

Electronic teaching materials should be made by the teacher himself. Although now there are so many learning resources and easy access for students, teachers still need to design electronic teaching materials that utilize technology so that they can stimulate students' digital skills. Teachers can design electronic teaching materials by utilizing software according to the needs and characteristics of students.

One of the software that teachers can use to design electronic teaching materials is Kvisoft Flipbook Maker. This software can convert files in PDF form into electronic teaching materials that are displayed in digital form. This software can be used to insert some interesting media such as photos, audio, animation, and hyperlinks. This software not only contains text but also other media such as animation, photos, and videos, so that it looks more alive.

Kvisoft Flipbook Maker has several advantages. This software can be operated online on a cellphone or offline on a computer. This software is equipped with various kinds of templates with attractive and varied color combinations so that they can be used as backgrounds in making teaching materials according to the tastes of teachers and student characteristics. The final product created using this software can be saved in various formats.

Teaching materials with Kvisoft Flipbook Maker are useful for both teachers and students. Benefits for teachers include: teaching materials designed are complete teaching materials so they do not require other additional books. Meanwhile, the benefits for students are: creating impressive learning activities, increasing student enthusiasm for learning, and making it easier for students to achieve the expected learning goals. Through teaching materials made with Kvisoft Flipbook Maker, teachers can increase students' enthusiasm for learning.

The development of electronic teaching materials for Newton's law materials with Kvisoft Flipbook Maker is important. On this basis, researchers are interested in conducting research. This research is entitled "Results of Validation of Newton's Law of Electronic Teaching Materials with Kvisoft Flipbook Maker for Class X High School Students". This study aims to determine the results of the validation of Newton's law electronic teaching materials with Kvisoft Flipbook Maker.

## II. METHOD

The research method used is a type of research and development (R&D) which is one of the research methods that can be used in researching, designing, producing, and testing the validity of products that have been

developed [14]. Newton's law electronic teaching materials with Kvisoft Flipbook Maker are used as objects in this study. Sugiyono's development model (2017) is the development model used in this study which consists of ten steps: the first step is the potential and problems, the second step is information gathering, the third step is designing research products, the fourth step is validation of research products, the fifth step is research product validation, testing the use of research products, the sixth step is revising the research product, the seventh step is testing the research product, the eighth step is revising the design, the ninth step is revising the research product, and the tenth step is mass-producing research products.

This study has several procedures. There are 6 procedures in this study, namely: 1) determining potential and problems, 2) gathering information, 3) designing research products, 4) validating research product designs, 5) revising research products and 6) testing research products. The potential of SMAN 1 Payakumbuh District supports this research. This is illustrated by the students at SMAN 1 Payakumbuh District already have their own cellphones so that they can be used to learn using electronic teaching materials. In addition, the school also provides WIFI which can be used for learning. When collecting information, information was obtained regarding the appropriate structure of electronic teaching materials according to the Ministry of National Education (2010).

Newton's law electronic teaching materials with Kvisoft Flipbook Maker were developed at the research product design stage. The research product is further validated after the design stage is carried out. Validation of research products is carried out by a team of validators called experts. After validating the research product, the next step is to revise the research product based on the shortcomings obtained from the validator's suggestions.

The validity test sheet is the instrument used in this study. Validity test sheets from experts consisting of certain indicators are used to determine the validity of research product development. The indicators of the expert validity test sheet consist of the feasibility component of the subject matter content, the feasibility component of the visual appearance of electronic teaching materials, the feasibility component of the learning design used, and the feasibility component of the software used in designing electronic teaching materials.

The validation questionnaire is part of the developed electronic teaching material validation instrument which is filled out by the validator team. The validation value is determined based on the interpretation criteria of the score obtained. The validity of Newton's law electronic teaching materials with Kvisoft Flipbook Maker is determined based on the criteria shown in Table 1.

**Table 1.** Product Validity Criteria

Percentage	Criteria
0-20	Not Valid
21-40	Less Valid
41-60	Enough Valid
61-80	Valid
81-100	Very Valid

(Source: Ref [15])

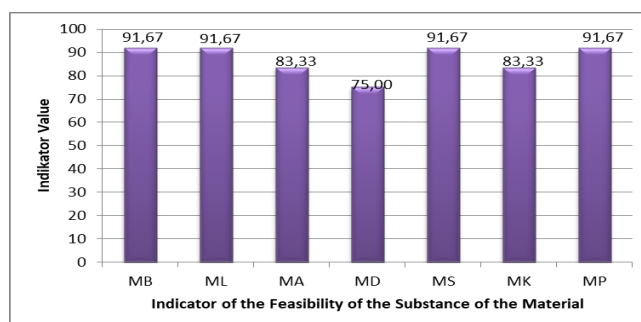
The validation results were analyzed using descriptive statistics. Descriptive statistics learn how to collect, tabulate, and classify data in order to make it easy to understand. The results of this analysis are depicted in the form of a graph with a validation score in the range 0-100.

### III. RESULT AND DISCUSSION

The result of this research is the validity of Newton's law electronic teaching materials with Kvisoft Flipbook Maker. The team of validators who validated electronic teaching materials were three physics lecturers at Padang State University who were referred to as experts. The results of the validation of electronic teaching materials are used as a determinant of the feasibility of electronic teaching materials and guidelines for revising the electronic teaching materials that have been made. The validation instrument for electronic teaching materials for Newton's law materials with Kvisoft Flipbook Maker was developed based on four components, namely the feasibility of the content of the subject matter, the feasibility of the visual appearance of electronic teaching materials, the feasibility of the learning design used, and the feasibility of the software used in designing electronic teaching materials. Each component in the validation instrument has several indicators. This indicator has a value obtained from the score given by the validator on the validation instrument.

The first component is the component of the feasibility of the content of the subject matter in electronic teaching materials. This component has 7 indicators, including: 1) the validity of the content of the subject matter in electronic teaching materials (MB), 2) the coverage of the contents of the complete electronic teaching materials (ML), 3) materials in electronic teaching materials contain actual information, (MA), 4) the use of language in electronic teaching materials is easy to understand, (MD) 5) electronic teaching materials contain

experimental steps that encourage students to develop scientific attitudes (MS), 6) the subject matter in electronic teaching materials supports students to develop their skills (MK), and 7) electronic teaching materials contain questions that can increase students' knowledge of subject matter related to the experiments carried out (MP). The results of the value plot for the feasibility component of the subject matter content in electronic teaching materials are shown as Figure 1.



**Fig 1.** Feasibility Component Validity Value Substance of Materials in Electronic Teaching Materials

From the value obtained for each category of indicators on the content feasibility component, it can be stated that the validity of electronic teaching materials is in good and very good criteria. The validity of electronic teaching materials is in good criteria for easy-to-understand language indicators with a value of 75.00 and very good for indicators of the validity of the content of materials in electronic teaching materials, completeness of the coverage of material content in electronic teaching materials, currentness of information in electronic teaching materials, experimental steps on electronic teaching materials that develop students' scientific attitudes, subject matter in accordance with skill competencies, and practice questions in electronic teaching materials that improve students' understanding with a range of values from 83.33 to 91.67. The average value of the validation of electronic teaching materials on the content feasibility component is 86.90 with very good criteria.

The subject matter contained in electronic teaching materials has been categorized as feasible based on the results of data analysis. Electronic teaching materials have met the criteria for good teaching materials in terms of material including: 1) electronic teaching materials already contain subject matter that is in accordance with scientific rules, 2) the scope of content in electronic teaching materials is complete, 3) material in electronic teaching materials already contains actual information, 4) the use of language in electronic teaching materials is easy to understand, 5) the experimental steps contained in electronic teaching materials have encouraged students to develop scientific attitudes, 6) the subject matter in electronic teaching materials has supported students to develop their skills, and 7) electronic teaching materials already contain questions that can increase students' knowledge of subject matter related to the experiments carried out. The feasibility of the content of the material presented in electronic teaching materials adds to the enthusiasm of students to understand the subject matter.

The second component is the feasibility component of the visual display of electronic teaching materials. This component has 6 indicators. These indicators are: 1) electronic teaching materials are equipped with instructions buttons and links that can be operated smoothly (ND), 2) the layout and design of electronic teaching materials is neat and has the appropriate size (TL), 3) the letters used on electronic teaching materials can clearly be read well (TH), 4) the choice of colors used in electronic teaching materials is contrasting and attractive (WR), 5) virtual experiments in electronic teaching materials can be carried out smoothly (VL), 6) media that contained in electronic teaching materials relevant to the material being studied (GA). The results of the value plot for the feasibility component of the visual appearance of electronic teaching materials are averaged for each category as shown in Figure 2.

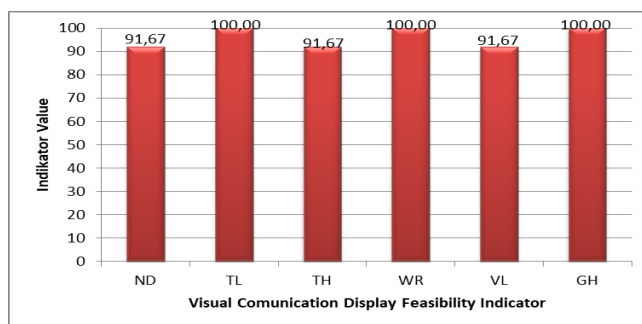


Fig 2. Validity Value of the Feasibility Component Visual Communication Display of Electronic Teaching Materials

Based on the value obtained for each indicator of the feasibility component of the visual display of electronic teaching materials, it can be stated that the validation value of electronic teaching materials for the feasibility component of the visual appearance of electronic teaching materials is in the very good category. The indicators of the feasibility of the visual display of electronic teaching materials are in very good validation criteria with a value range of 91.67-100. The validation value of electronic teaching materials for the visual communication display feasibility component with an average of 95.83 is in the very good category.

The visual display of electronic teaching materials has been categorized as feasible based on the results of data analysis. Electronic teaching materials have met the criteria for good teaching materials in terms of the appearance of visual communication, including: 1) the instruction buttons and links contained in electronic teaching materials can be operated smoothly, 2) the layout and design of electronic teaching materials is neat and has the right size. appropriate, 3) the letters used in electronic teaching materials are clear and can be read well, 4) the choice of colors used in electronic teaching materials is contrasting and attractive, 5) virtual experiments in electronic teaching materials can be carried out smoothly, and 6) media that contained in electronic teaching materials relevant to the material being studied. The feasibility of the visual display of electronic teaching materials makes it easier for students to understand every step of learning contained in electronic teaching materials.

The third component is the feasibility component of the learning design used. This component has 9 indicators. These indicators are: 1) the title of the electronic teaching material is relevant to the content of the subject matter (JD), 2) the electronic teaching material is relevant to the competencies to be achieved (KT), 3) the electronic teaching material contains learning objectives that are relevant to the competencies to be studied. achieved by students and beneficial for students who use it (MF), 4) learning objectives to be achieved are relevant to the subject matter in electronic teaching materials (TP), 5) practice questions in electronic teaching materials are relevant to competencies and learning objectives to be achieved (PP), 6) practice questions in electronic teaching materials can stimulate students to develop their knowledge (PG), 7) examples of questions in electronic teaching materials are relevant to the material and competencies to be achieved and improve student understanding (CS), 8) questions/practices in electronic teaching materials allow students to master the expected basic competencies (SL), 9) electronic teaching materials include announce sufficient references (with more than five references) (RF) . The results of the value plot for the feasibility component of the learning design are shown in Figure 3.

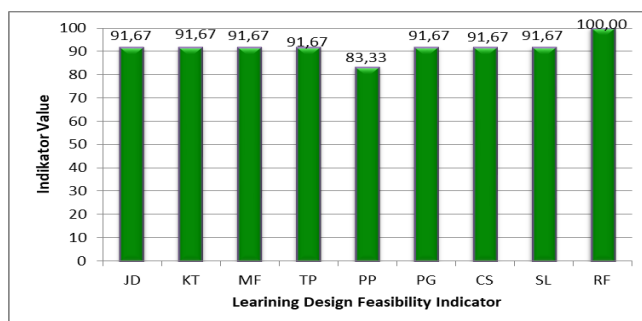


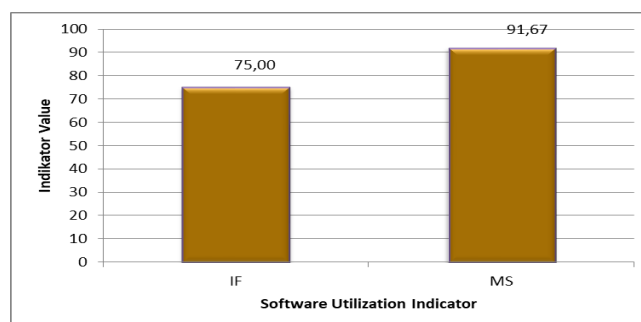
Fig 3. Validity Value of the Feasibility Component of Learning Design

From the value obtained for each indicator of the feasibility component of learning design, it can be stated that the validation value of electronic teaching materials for the feasibility component of learning design is in the very good category. The indicators of the feasibility of the learning design are in the very good validation

category with a value range of 83.33-100. The value of teaching material validation for the feasibility component of learning design with an average of 91.67 is in the very good category.

The display of learning designs used in electronic teaching materials has been categorized as feasible based on the results of data analysis. Electronic teaching materials have met the criteria for good teaching materials in terms of the appearance of the learning design used, including: 1) the title of the electronic teaching material is relevant to the subject matter, 2) the electronic teaching material is relevant to the competencies to be achieved, 3) the electronic teaching material already contains learning objectives that are relevant to the competencies to be achieved by students and beneficial for students who use them, 4) the learning objectives to be achieved are relevant to the subject matter in electronic teaching materials, 5) the practice questions in electronic teaching materials are relevant to the competencies and learning objectives to be achieved, 6) practice questions in electronic teaching materials can stimulate students to develop knowledge, 7) sample questions in electronic teaching materials are in accordance with learning objectives and encourage students to improve their understanding, 8) examples of questions that is in electronic teaching materials is relevant with the materials and competencies to be achieved, and 9) electronic teaching materials have included sufficient references (with more than five references). The feasibility of displaying the learning design can make it easier for students to understand the competencies to be achieved in learning.

The fourth component is the component of using software in designing electronic teaching materials. This component has 2 indicators. 1) there is a reciprocal interaction between the system and users of electronic teaching materials (IF), 2) using software in designing electronic teaching materials (MS). The results of the value plot for the feasibility component of using the software are shown in Figure 4.



**Fig 4.** Value of Software Utilization Component Validity

From the values obtained for each component indicator of the use of software, it can be stated that the validation value of electronic teaching materials for this component is 75.00-91.67 for both indicators. This value is in good criteria for indicators of reciprocal interaction between the system and users of electronic teaching materials with a value of 75.00 and very good for indicators of software use with a value of 91.67. The average value of validation for this component is 83.33 with very good criteria.

The use of software in designing electronic teaching materials has been categorized as feasible based on the results of data analysis. Electronic teaching materials have met the criteria for good teaching materials in terms of software use, including: 1) electronic teaching materials can cause reciprocal interactions between the system and users of electronic teaching materials, 2) electronic teaching materials designed already use supporting software. The feasibility of using software in designing electronic teaching materials can encourage students to develop digital skills according to the demands of the 21st century.

Electronic teaching materials have 4 validation components that have been analyzed. The four components include: the feasibility of the subject matter content (SM), the feasibility of the visual display of electronic teaching materials (KM), the feasibility of the learning design used (DP), and the use of software in designing electronic teaching materials (PS). The average analysis for the four components is plotted in the graph shown in Figure 5.



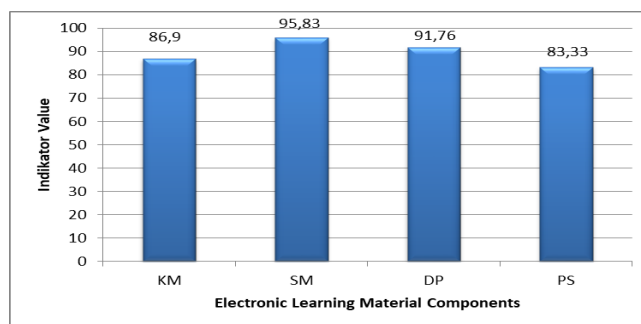


Fig 5. Validation Value of Electronic Learning Material Components

Based on the values obtained, it can be stated that the validation value for each component is in the range of 83.33-95.85 with very good criteria. The average value of the validation of electronic teaching materials from the three validators for the four validation components is 89.43. The validation of Newton's law electronic teaching materials with Kvisoft Flipbook Maker for X grade high school students is very good.

The research product was revised based on input from the validator team after validation. Some inputs from the validator team for the improvement of electronic teaching materials include: 1) the cover of electronic teaching materials must be relevant to the learning material, 2) the material in electronic teaching materials should be more contextual, 3) evaluation questions in electronic teaching materials should be added to 20 questions. 4) work instructions on electronic teaching materials should be replaced with worksheets 5) need to be revised for some writing of physics formulas and symbols used in electronic teaching materials 6) sentences in electronic teaching materials are written according to the SPOK structure, 7) the information given in the picture is adjusted to the image shown, 8) the symbols for physical quantities are written correctly, especially in writing vector quantities, 9) the mathematical steps are written in a coherent way, so that they are easier to understand. Revision of electronic teaching materials is carried out in order to get a better product.

Flipbook Maker have met the structure of teaching materials according to the guidelines for preparing teaching materials in the Ministry of National Education (2010)[9]. The visual appearance of electronic teaching materials such as layouts, animations, images, videos and color combinations is overall proportional according to the validator so that electronic teaching materials are more interesting to read. From the results obtained, it can be stated that the validation of electronic teaching materials for Newton's law materials with Kvisoft Flipbook Maker is in very good criteria applied in learning activities for class X high school students.

The components of the assessment of electronic teaching materials have not all achieved good grades, electronic teaching materials need to be revised. Revisions are made based on input from the validator team so that electronic teaching materials can meet the criteria for each validation component.

The research that has been done has some limitations in its implementation. This limitation can occur because of the weaknesses of the researcher. The limitations in this study are expected to be used as lessons and can be improved for the future[15][16].

The limitation in this research is the new research stage until the research product trial stage. This stage is limited to one class only. This limitation is due to the lack of time for researchers to conduct research. This research idea can be continued at the stage of testing research products in several classes, then it can be developed again at the stage of mass product production which has a broad scope.

The second limitation is that the teaching materials used are limited to the Kvisoft Flipbook Maker Software. An alternative solution to overcome the problem is to develop electronic teaching materials using other software such as Adobe Captivate software, Sigil software, etc. The selection of the right software can determine the quality of the teaching materials produced.

The third limitation, the research is only limited to two KD class X semester 2. This is due to the limited time of the researcher. An alternative solution to overcome this obstacle is expected to develop teaching materials based on all the material contained in class X semester 1 and semester 2, so as to be able to produce complete teaching materials.

#### IV. CONCLUSION

Based on the results obtained, conclusions are obtained. The conclusion obtained is that the validity of Newton's law electronic teaching materials with Kvisoft Flipbook Maker is very good. Electronic teaching materials are valid in the components of the feasibility of the content of the subject matter, the feasibility of the visual appearance of electronic teaching materials, the feasibility of the learning design used and the feasibility of using software in designing electronic teaching materials. So, it can be concluded that Newton's law electronic



teaching materials with Kvisoft Flipbook Maker are valid to be applied in learning activities for class X high school students.

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