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*by Rizki Bayu Kurniawan*

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## Development of physics learning media based on Lectora Inspire Software on the elasticity and Hooke's law material in senior high school

R B Kurniawan, M Mujasam, I Yusuf and S W Widyaningsih\*

Jurusan Pendidikan Fisika, Universitas Papua, Jl. Gunung Salju Amban, Manokwari  
98314, Indonesia

\*s.widyaningsih@unipa.ac.id

**Abstract** The purpose of this research was to develop physics learning media based on software lectora inspire at elasticity and Hooke's law material that are valid, practical, and effective. This development stages follow ADDIE model that consists of five phases (analyze, design, development, implementation, and evaluation). The tabulation process and analyzing the data uses Rush models through the software of winstep and facets. Process validation of learning media by the validator, obtained by the result of facets analysis showing good validation result. The implementation stage in SMAN 2 Manokwari, obtained winstep analysis results showing that the practicalities and effectiveness of instructional media that are in a good category. Developed learning media can be used to support the physics learning media at school.

### 1. Introduction

The development of science and technology has brought about changes in almost every aspect of life. One of the experiences in the touch of science and technology that is education aspect. Seeing this, the world of education needs to get more attention from the government with the demand to produce qualified Human Resources (HR). Education as an integral dimension of the process of human maturity certainly, on the one hand, has a big share for the development of science and technology. However, the world of education also needs to take advantage of the progress of science and technology to be able to achieve its goals. The progress of science and technology has influenced learning equipment in educational institutions.

Science subjects are mostly abstract material that is difficult to convey directly to learners [1]. Visualization is a practical solution for understanding something abstract. Seeing the development of science and technology is very significant, so it can be utilized as a means of visualizing learning materials that are still abstract and difficult to understand or be taught due to lack of tools or media to deliver it. Channeling learning content through technology is the right solution to answer the problem of abstract science material to understand. It is commonly referred to as educational technology or more commonly known as learning technology [2].

Learning technology can be used to solve various problems. It will certainly give a good impact on the learning process. Even though the learning process will be better if supported by adequate media usage. Learners will interact directly with learning resources with the help of media that can lead to the achievement of the learning goals. Media means everything that is used to channel a message from the sender (teacher) to the recipient (learners) so that the learning process is done [3,4].



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Based on the observations in SMAN 2 Manokwari, the process of learning implemented is still less regarding utilization of instructional media. Physical equipment contained in the physics laboratory is minimal, and the condition is not feasible to use. It is a serious concern because physics is a subject that should have the application of a practicum or demonstration directly witnessed and played by the learners. For that, it needs innovation to answer the problems that exist. Innovation that can be offered is to utilize the progress of science and technology today using computer learning media one of them using software *lectora inspire*. It is supported by various studies that have been done before by researchers who claim that the use of *lectora inspire*-based media is worthy of being used as a medium of learning to help learners understand the material [5]. So it is necessary to develop innovation in the field of physics of high school. The development of learning media is expected to help learners better understand the material of elasticity and Hooke's law. Therefore, the purpose of this study, namely to determine the validity, affectivity, and practicality of learning media developed.

## 2. Method

This research developed by using ADDIE (Analyze, Design, Development, Implementation, and Evaluation) [6]. Before the implementation of this instructional media, the first validation of learning media software-based *lectora inspire*. Instruments used in this study include validity sheets filled by validators. Affectivity and practicality sheets filled by learners. The subjects were students of class XI IPA 3 SMAN 2 Manokwari West Papua academic year 2017/2018. Data analysis techniques using Rasch model through *winstep* and *facets* application to know the validity, practicality, and affectivity of learning media.

## 3. Result and discussion

Learning media developed in this study using software *lectora inspire*. Learning media was designed with some content or menu that can help teachers and learners in carrying out the process of teaching and learning in the classroom. For the menus contained in this medium is divided into four main menus of competency standards, learning materials, virtual laboratory, and evaluation of learning.

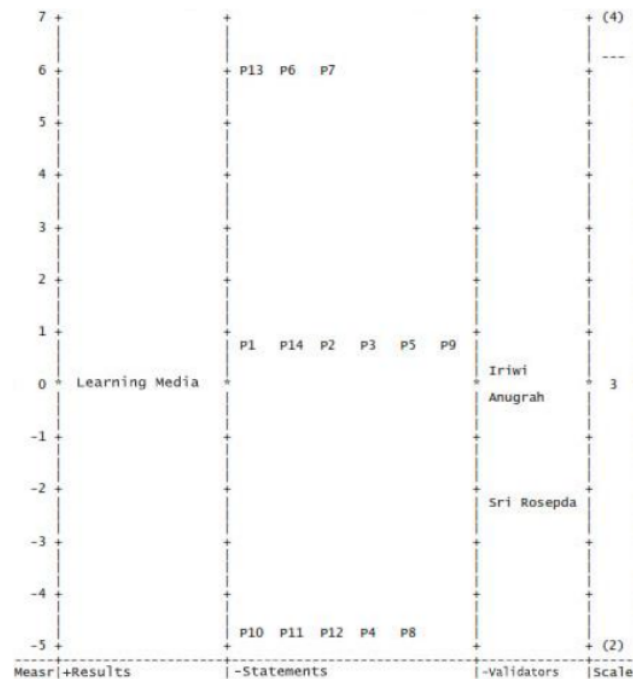


**Figure 1.** Display of instructional media developed in the study.

Figure 1 shows the display of instructional media developed in the study. Media was equipped with a menu or navigation buttons that make it easier for users. The material has prepared in this media was very complete discussing the material of elasticity and Hooke's law. Also to add convenience and make learning physics more interesting, this medium was designed with a very attractive display and equipped with musical instruments. The inclusion of some interest images, animations, and simulations in instructional media can help learners to more easily understand the material of physics [7].

### 3.1. Validity

Validation of learning media carried out by the previously selected validator. The validators in this research are two lecturers of Jurusan Pendidikan Fisika Universitas Papua (Iriwi L S Sinon and Sri Rosepda Sebayang) and physics subject teacher in SMAN 2 Manokwari (Anugrah Rahayu Ekaningsih). Validation of instructional media that have been executed by validator then processed using Facets application, as shown in table validation of learning media figure 2.

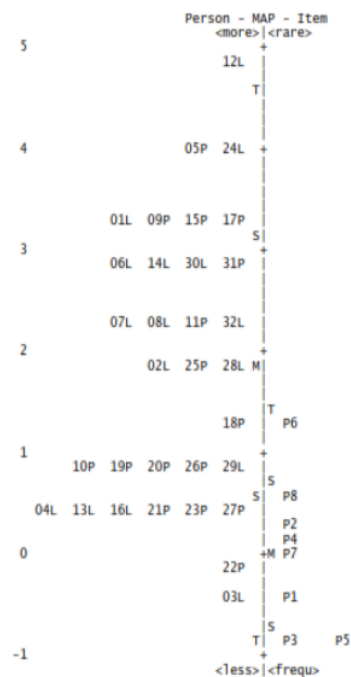


**Figure 2.** Results of data validity analysis using facets application.

Figure 2 illustrates the distribution of statements contained in the validation sheet. The number of statements in the validation of instructional media is 14 statements filled by the validator. In figure 2, it can be seen that in general the statements given can illustrate the results of the validity of good learning media. Statement number P6 (presentation of evaluation), P7 (interesting material), and P13 (interesting text usage) have the highest logit value, that is 6. This indicates that the statement is difficult to be approved by the validator so that in that aspect the improvement is made. While the statement with the number P4 (material demand), P8 (material suitability with lesson plan), P10 (ease material menu), P11 (available navigation buttons), and P12 (available menu entry button) has the lowest logit value, that is below -4. This states that all validators approve the statement easily.

### 3.2. Practicality

The process of assessing the practical aspects of instructional media was done by giving a questionnaire of practicality to the students of class XI IPA 3 SMAN 2 Manokwari. The questionnaire was carried out after going through the process of implementing instructional media applied through the learning process. Furthermore, after obtaining preliminary data to assess the practicality of learning media through questionnaires, the data is processed using winsteps application, so that obtained the results of practicality in figure 3.

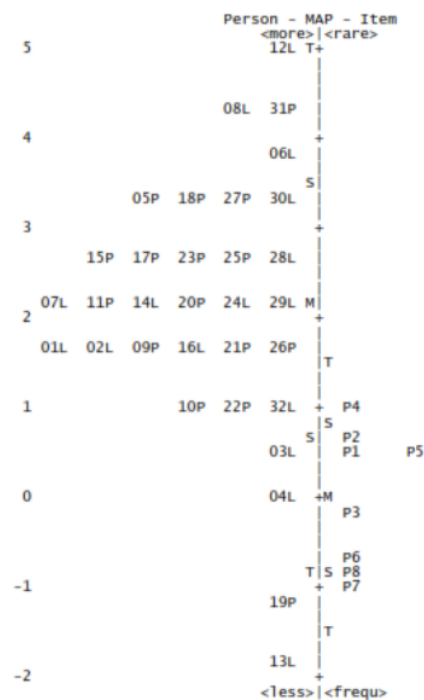


**Figure 3.** The results of questionnaire analysis practicality of using the application winsteps.

The result of analysis of instructional media from the aspect of practicality figure 3 explains the distribution of the statement contained in the questionnaire of instructional media practicality filled by the students of class XI IPA 3 SMAN 2 Manokwari. In the figure 3 can be seen the distribution of learners (person) and revelation (item) based on logit value. Learners with 12L have a logit +5. The learner has the highest logit value or easily approves the statement contained in the questionnaire of practice. Furthermore, statement number P4 (responding percentage) has the highest logit value is +1 and has the smallest total score value of the other statement is 92. So that statement is the most difficult approved by learners. Statements with P3 numbers (front view) and P5 (simulation lab) have the smallest logic value that is -1 with the highest total score is 111 compared to the other statement. So learners most easily approve that statement. In the result of the questionnaire of practicality in class XI IPA 3 SMAN 2 Manokwari, dominant learners love learning using media lectora inspire. The use of virtual laboratories found in lectora inspire media designed can improve student achievement compared with using real laboratories [8]. The use of virtual lab learning media can channel learners' activities to measure their ability in the learning process, which can mimic the activities of scientists [9,10,11].

### 3.3. Affectivity

The process of assessing the affectivity of instructional media aspect conducted by supplying the affectivity questionnaire to students of class XI IPA 3 SMAN 2 Manokwari. The questionnaire was carried out after going through the process of implementing instructional media applied through the learning process. Furthermore, after obtaining preliminary data to assess the practicability of learning media through the questionnaire, the data is processed using the winsteps application to obtain the results of affectivity as in figure 4.



**Figure 4.** Results of the affectivity questionnaire analysis that has been obtained using winsteps application.

Based on figure 4 it is seen that the 12L learner has the highest logit score of +5 or easily approves the statement contained in the affectivity questionnaire. Furthermore, the highest statement with a P4 number (responding percentage) has the highest logit value is +1 and has the smallest total score value of the other statement is 92. So that statement is the most difficult approved by learners. Statements with P7 (working in groups) have the least logit value of -1 with the highest total score of 107 compared to the other statements. So that statement is most easily approved by learners. In the results of the affectivity questionnaire in class XI IPA 3 SMAN 2 Manokwari, dominant learners love learning using Lectora media in the form of virtual lab simulations. Learners who have implemented the learning process using virtual lab learning media mostly feel happy and easy in learning physics [12,13]. The use of virtual lab learning media can be an effective solution in enhancing learners' motivation to learn physics material [14,15,16].

**4. Conclusion**

The results of data analysis using the facets application and winsteps the Rasch model can be concluded that for the third aspect of the objectives of this study, the validity, practicality, and the affectivity of having good criteria. Actually to develop the learning media can be used to support the process of physics learning on elasticity and Hooke's law in high school.

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