

iopscience.iop.org/volume/1742-6596/1157

IOPscience Journals Books Publishing Support Login

Journal of Physics: Conference Series

Issues

Volume 1157, 2019

International Conference on Mathematics and Science Education (ICMScE 2018) 5 May 2018, Bandung, Indonesia

Accepted papers received: 24 December 2018
Published online: 12 March 2019

JOURNAL LINKS

- [Journal home](#)
- [Journal Scope](#)
- [Information for organizers](#)
- [Information for authors](#)
- [Contact us](#)
- [Reprint services from Curran Associates](#)

Latest issues

(complete)

- [Number 3, February 2019](#)
- [Number 4, February 2019](#)
- [Number 2, March 2019](#)
- [Number 1, March 2019](#)

Choosing Laser and LED Sources for Time-Resolved Photoluminescence Experiments

Table of contents

Volume 1157
February 2019
 • Previous issue Next issue •
 Accepted papers received: 24 December 2018
 Published online: 12 March 2019

- JOURNAL LINKS
- Journal home
 - Journal Scope
 - Information for organizers
 - Information for authors
 - Contact us
 - Reprint services from Curran Associates



Open all abstracts

Issue 3

Papers

OPEN ACCESS		032001
The implementation of chordophone enrichment book as an essential factor to create meaningful learning		
H Kurniawati and S Maulana		
+ Open abstract View article PDF		
OPEN ACCESS		032002
Experience in nuclear reactor physics laboratory exercises using Kartini research reactor		
S Syarif and P I Wahyuni		
+ Open abstract View article PDF		
OPEN ACCESS		032003
The critical thinking effect of the computer simulation in the physics teaching and learning		
D Sulaworo, T Handayani and D A Kusumaningtyas		
+ Open abstract View article PDF		
OPEN ACCESS		032004
A computer based learning resource to support students to learn gas law and kinetic theory of gas		
E Pratiwidina		
+ Open abstract View article PDF		
OPEN ACCESS		032005
The development of cooperative problem solving physics laboratory model on simple pendulum concept		
D H Putri, E Riolianto, S Sutarno and D Hamdani		
+ Open abstract View article PDF		
OPEN ACCESS		032006
Biliqueites production as teaching aids physics for improving science process skills		
R Haryadi, M Viza, I S Utami, I Ihsanudin, Y Setiani and A Suhrman		
+ Open abstract View article PDF		
OPEN ACCESS		032007
Development of critical thinking instrument of electricity for senior high school students		
T D Yanti, W Suana, N Maharta, K Herlina and I W Dastrik		
+ Open abstract View article PDF		
OPEN ACCESS		032008
Implementation of cooperative learning group investigation to improve students self-efficacy and learning achievement on statics fluid		
G A R Tirta, P Prabowo and S Kungoro		
+ Open abstract View article PDF		
OPEN ACCESS		032009
Inquiry instructional model infused blended experiment: helping students enhance critical thinking skills		
S Gumilar, A Ismail, D M Budiman and S Siswanto		
+ Open abstract View article PDF		
OPEN ACCESS		032010
Enhancing problem-solving skills of students through problem solving laboratory model related to dynamic fluid		
A Malik, U A Yuningtyas, D Mulhayatilah, M M Chusni, S Sutarno, A Ismail and N Hermita		
+ Open abstract View article PDF		
OPEN ACCESS		032011
The effectiveness of OB-IPA teaching model to improve students' critical thinking skills on senior high school physics subject		
P A D Sulistyowati, B K Prahari, Z A I Supardi and B Jatmiko		
+ Open abstract View article PDF		
OPEN ACCESS		032012
What is the student response to using the weblogs for learning resources?		
I A D Astuti, D Sulaworo and T Firdaus		
+ Open abstract View article PDF		
OPEN ACCESS		032013
Using physics representation worksheet to enhance students' understanding and performance about force		
H Hamdani, S Muryid and J Sirat		
+ Open abstract View article PDF		
OPEN ACCESS		032014
Argument-driven inquiry instruction to facilitate scientific reasoning of 11th grade students in light and visual instrument topic		
K Imbaud, T Bongkotphet and S Chindanuka		
+ Open abstract View article PDF		
OPEN ACCESS		032015
Learning management through engineering design process based on STEM education for developing creative thinking in equilibrium topic for 10 th grade students		
T Matiphatkul, T Bongkotphet and K Dangudom		
+ Open abstract View article PDF		
OPEN ACCESS		032016
Development of learning instrument of active learning strategy integrated with computer simulation in physics teaching and learning on makassar state university		
P Falloan and A Sewandi		
+ Open abstract View article PDF		
OPEN ACCESS		032017
The effectiveness of PO2E2W learning model on natural science learning to improve problem solving skills of primary school students		
S Pratiwi, B K Prahari, S Suryani and B Jatmiko		
+ Open abstract View article PDF		
OPEN ACCESS		032018
Pre-service science teachers' conceptual understanding level on several electricity concepts		
D E Sapitro, S Sarwanto, S Sukamin and D Ratnasari		
+ Open abstract View article PDF		
OPEN ACCESS		032019
Enhancing students creative thinking skills through web blog-assisted cooperative integrated reading and composition (CIRC) learning		
S Fatmawati		
+ Open abstract View article PDF		
OPEN ACCESS		032020
Implementing a four-tier diagnostic test to assess elementary school students' on electricity magnetism concept		
H Marhadi, I Lazim, N Hermita, M Alpuarsi, A Widyanti, A Suhandi, S Sutarno, K Mahbubah and A Samsudin		
+ Open abstract View article PDF		
OPEN ACCESS		032021
HOTs profile of physics education students in STEM-based classes using PHET media		
I Yusuf and S W Widyaningih		
+ Open abstract View article PDF		
OPEN ACCESS		
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 Widyaningih		
+ Open abstract View article PDF		

COMMITTEE

Home / COMMITTEE

Share



STEERING COMMITTEE

1. Prof. Dr. H. R. Asep Kadarohman, M.Si.
2. Prof. Dr. Didi Suliyadi, M.A.
3. Prof. H. Yaya Suljaya Kusumah, M.Sc., Ph.D.
4. Prof. Dr. Hj. Anna Permanasari, M.Si.
5. Prof. Dr. Disman, M.S.
6. Siti Fatimah, S.Pd, M.Si, Ph.D.

INTERNATIONAL ADVISOR BOARDS

1. Lew Hee-Chan, Mathematics Education (South Korea);
2. Seoung-Hye Paik, Science Education (South Korea);
3. Didi Suryadi, Mathematics Education (Indonesia);
4. Bernd Ralle, Didactics of Chemistry (Germany);
5. IN CONFIRMATION
6. IN CONFIRMATION
7. Prof. Dr. Hj. Rr. Hertien K. Surtikanti, Universitas Pendidikan Indonesia, Indonesia
8. Prof. Dr. Hj. Nurjani Y. Rustaman, M.Pd, Universitas Pendidikan Indonesia, Indonesia
9. Prof. Dr. Liliasari, M.Pd, Universitas Pendidikan Indonesia, Indonesia
10. Prof. Dr. Phil. Ani Widodo, M.Ed, Universitas Pendidikan Indonesia, Indonesia
11. Dr. Topik Hidayat, Ph.D, Universitas Pendidikan Indonesia, Indonesia

SCIENTIFIC COMMITTEE

1. Dr. Nahadi, M.Pd.
2. Dr. Dadi Ruediana, M.Si.
3. Dr. Riandi, M.Pd.
4. Dr. Bambang Supriatno, M.Si.
5. Dr. Ahmad Muzakir, M.Si.
6. Dr. Taufik Ramlan, M.Si.
7. Dr. Diana Rochintanawati, M.Ed.
8. Dr. Winny Liliawati, M.Si.
9. Dr. Elah Nurlaelah, M.Si.
10. Fitri Khoerunnisa, Ph.D.
11. Lilik Rusjati, M.Pd.

Paper Reviewer:

1. Dr. Ade Ghafor Abdullah, M.Si.
2. Dr. Eng. Asep Bayu Dani Nandianto, M.Si.
3. Lala Septem Riza, M.Si, Ph.D.
4. Dr. Heli Siti Halimatul Munawaroh, M.Si.
5. Dr. Eni Nuraini, M.Pd.
6. Al Jupri, M.Sc, Ph.D.
7. Dr. Ahmad Samsudin, M.Pd.
8. Dr. Ridwan Efendi, M.Pd.

Chairman:

Dr. H. Sujiyanti Prabawanto, M.Ed

Leader Executive:

1. Invan Permana, M.Pd.
2. Erwin, M.Pd.
3. Ridwan, S.Pd.

Secretary:

1. Muhammad Satriawan, M.Pd.
2. Muhammad Syaiful Hayat, M.Pd.

Treasurer:

1. Yayan Sanjaya, Ph.D.
2. Rika Rafikah Agustini, M.Pd.
3. Jumrodah, M.Pd.

Secretariat:

1. Sapudin, M.Pd.
2. Ike Festina, M.Pd.
3. Juli Firmansyah, M.Pd.

Sections Program:

1. Cece Subia, S.Pd.
2. Anisa, M.Pd.

Sections Publication:

1. M. Sutarno, M.Pd.
2. Shohibul Ahyar, M.Pd.

Public Relation and Documentation:

1. Thoha Firdaus, M.Pd.Si.
2. Maruf Rivaldi, S.Pd.

Transportation and Accommodation:

1. Al Fais Putra Alam, S.Pd.
2. Kadek Dwi Hendratma G.
3. Patra Aghtiar R.

Sections Food

1. Wileka Septiana, S.Pd.
2. Arini Rosa Sinensis, M.Pd.
3. Yulianto, M.Pd.

[DOWNLOAD ARTICLE
TEMPLATE](#)

Download

- Book of Program
- Plagiarism statement form
- Readiness to pay fees to IOP form
- The List of Accepted Full Paper

Announcement

ICMScE 2018 Papers have been
Published

[Announcement of IOP Submission](#)

[Breaking News](#)

[Information About Payment](#)

[Announcement of Accepted Full
Paper for ICMScE 2018](#)

Subscribe to
Blog via Email

Enter your email address to
subscribe to this blog and receive
notifications of new posts by email.

Join 238 other subscribers

Find Us

Address

2nd Floor, Room 42 School of
Postgraduate Studies Building
Universitas Pendidikan Indonesia
Jl. Dr. Setiabudi No.229 Bandung,
Java Barat Indonesia (40154)

Hours

Monday—Friday, 08:30AM to
4:30PM




Proses Submit dan Revisi oleh Korespondensi Sri Wahyu Widyaningsih

☰ Gmail Active 17 of


Compose

Mail

- Inbox** 7,619  **ICMScE 2018** <icmsce2018.automail@upiconf.org> to me, science.conference Sun, Apr 29, 2018, 12:00 PM
- Starred
- Snoozed
- Sent
- More

Chat

Spaces

 No spaces yet
[Create or find a space](#)

Meet

[ABS-433 REVISED_PAPER] File Submitted to ICMScE 2018 External Inbox x

Please do NOT reply this automail
Always send your email to science.conference@upj.edu

Dear Mrs. Sri Wahyu Widyaningsih,

We have received the submission of your file.

Please download the file for your own backup.
File: http://icmsce2018.upiconf.org/ktz/files/revised_paper_abs-433_3779204695.docx

Abstract ID:
ABS-433

Title:
Development of physics learning media based on lectors inspire software on the elasticity and Hooke's law material in senior high school

Authors:
Rizky Bayu Kumiawan, Mujasam, Irfan Yusuf, Sri Wahyu Widyaningsih*

Type:
revised_paper

Topic:
3. Physics Education

Thank you very much.

PAPER • OPEN ACCESS

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

To cite this article: R B Kurniawan *et al* 2019 *J. Phys.: Conf. Ser.* **1157** 032022

View the [article online](#) for updates and enhancements.



ECS **240th ECS Meeting**
Digital Meeting, Oct 10-14, 2021
We are going fully digital!
Attendees register for free!
REGISTER NOW

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].



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.

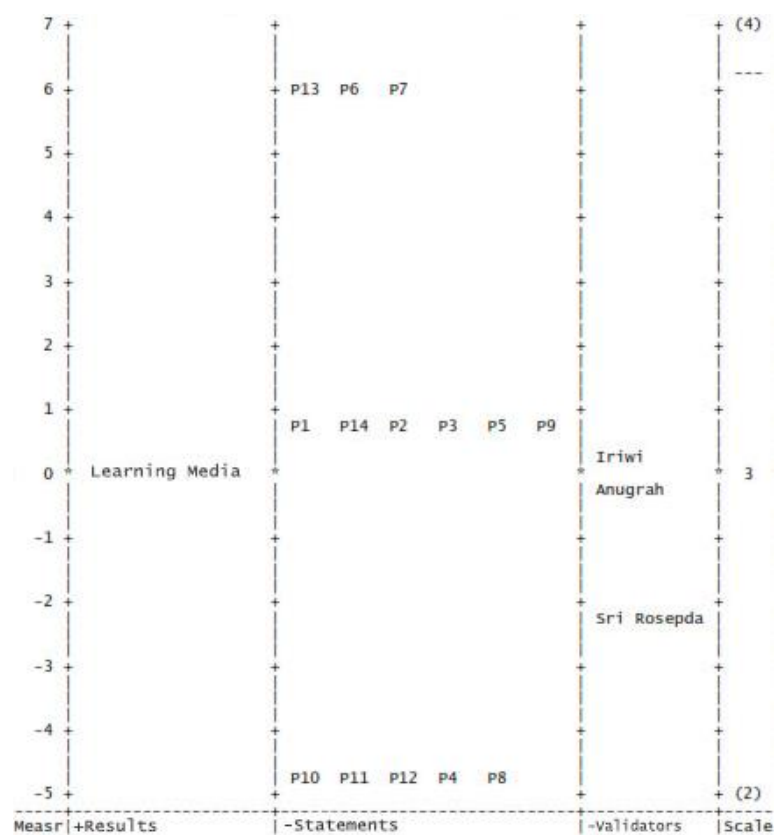


Figure 2. Results of data validity analysis using facets application.

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.

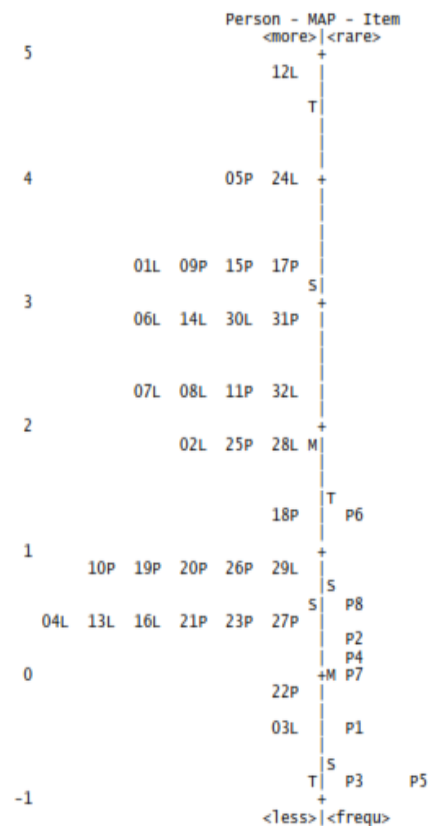


Figure 3. The results of questionnaire analysis practicality of using the application winsteps.

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.

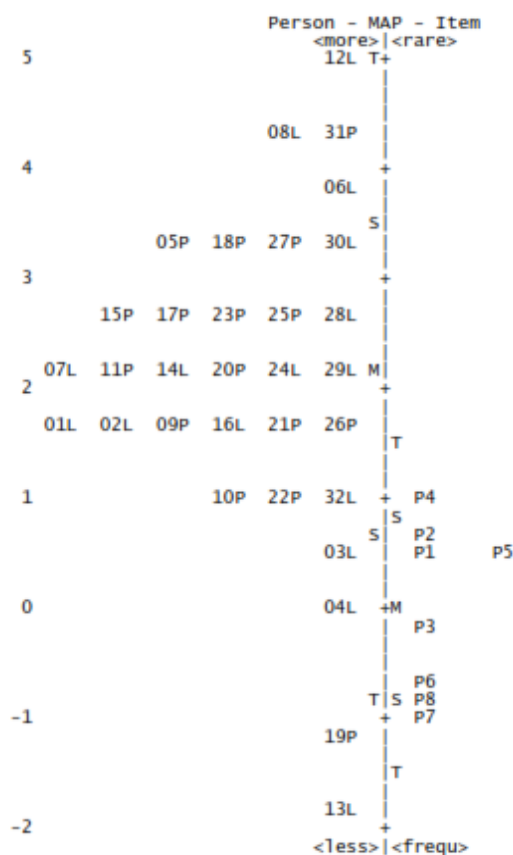


Figure 4. Results of the affectivity questionnaire analysis that has been obtained using winsteps application.

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.

Acknowledgments

Thanks to the dean of Fakultas Keguruan dan Ilmu Pendidikan Universitas Papua and the lecturers of the Jurusan Pendidikan Fisika for their support during the research. The authors also thank the head of SMAN 2 Manokwari for permission to carry out the research given.

References

- [1] Babiker M E A 2015 For effective use of multimedia in education, teachers must develop their own educational multimedia applications *TOJET* **14** pp 62-68
- [2] Stosic L 2015 The importance of educational technology in teaching *IJCRSEE* **3** pp 111-114
- [3] Lawrence H and Miller M 2014 A historical perspective of the evolution of technology education *IJITE* **3** pp 1-7
- [4] Katherine K, Perkins Emily B, Moore and Stephanie V C 2014 Examining the use of PhET interactive simulations in US College and high school classrooms *Proc. Int. Conf. on Physics Education Research Conference* (Minneapolis: American Association of Physics Teachers) p 209
- [5] Faruk A 2014 Development of interactive learning media based lectors inspire in discrete method course *Proc. Int. Conf. on Research Implementation and Education of Mathematics and Sciences* (Yogyakarta: Yogyakarta State University) p 72
- [6] Aldoobie N 2015 ADDIE model *American International Journal of Contemporary Research* **5** pp 68-72
- [7] Yusuf I, Widyaningsih S W, and Purwati D 2015 Pengembangan perangkat pembelajaran fisika modern berbasis media laboratorium virtual berdasarkan paradigma pembelajaran abad 21 dan kurikulum 2013 *Jurnal Pancaran Pendidikan* **4** pp 189-200
- [8] Martinez G, Francisco L N, Angel L P and Maria I S 2011 Comparative study of the effectiveness of three learning environments: hyper-realistic virtual simulations, traditional schematic simulations and traditional laboratory *Journal American Physical Society* **7** pp 1-12
- [9] Keller H E and Edward E K 2005 Making real virtual labs *Journal The Science Education Review* **4** pp 2-10
- [10] Mahanta A and Sarma K K 2012 Online resource and ICT-aided virtual laboratory setup *International Journal of Computer Applications* **52** pp 44-48
- [11] Cengiz T 2010 The effect of the virtual laboratory on students' achievement and attitude in chemistry *International Online Journal of Educational Sciences* **2** pp 37-53
- [12] Azis A and Yusuf I 2013 Aktivitas dan persepsi peserta didik dalam implementasi laboratorium virtual pada materi Fisika Modern di SMA *Jurnal Berkala Fisika Indonesia* **5** pp 37-42
- [13] Yusuf I and Subaer 2013 Pengembangan perangkat pembelajaran fisika berbasis media laboratorium virtual pada materi Dualisme Gelombang Partikel di SMA Tut Wuri Handayani Makassar *Jurnal Pendidikan IPA Indonesia* **2** pp 189-194
- [14] Liaghatdar M J 2012 A study of current and desired state of physics education in Iranian Female Secondary Schools *Journal International Education Studies* **5** pp 50-56
- [15] Dobrzański L A and Honysz R 2011 Virtual examinations of alloying elements influence on alloy structural steels mechanical properties *Journal of Achievements in Mechanical and Materials Engineering* **49** pp 251-258
- [16] Harry E K and Edward E K 2005 Making real virtual labs *The science education review* **4** pp 2-10

ICMS₂₀₁₈ScE

Certificate

School of Postgraduate Studies
Universitas Pendidikan Indonesia



This certificate is awarded to:

Sri Wahyu Widyaningsih

has participated as

Presenter

in the International Conference on Mathematics and
Science Education (ICMS₂₀₁₈ScE) 2018

Theme:

"Promoting 21st Century Skills through Mathematics and Science Education"

Bandung, Indonesia, May 5th, 2018



Prof. H. Yaya S. Kusumah, M.Sc., Ph. D.
Director of School of Postgraduate Studies
Universitas Pendidikan Indonesia

ICMS₂₀₁₈ScE

Dr. H. Sufyani Prabawanto, M.Ed.
Conference Chair