



The Validation of Learning Devices Based on Cognitive Conflict Approach in Blended Learning Model

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Abstract: This study aims to describe validation of learning devices based on cognitive conflict approach in blended learning model. The learning devices are developed to improve students' concept mastery and critical thinking ability. The learning devices are lesson plans (RPP), learning materials, student worksheet, and evaluation instruments. This study is a research and development using 4-D model, define, design, develop, and disseminate. This study is focus on develop stage. Validation process is done in develop stage. Validation process is using instrument (validation sheet). The validity of the learning devices was assessed by 3 experts who are competent at Mataram University. Criticisms and suggestions given by validators are used as improvements to developed learning devices. Data analysis is about the validity and reliability (percentage of agreement). The results said learning devices is very suitable for learning. The results of agreement between validators showed developed learning devices scored more than 75% which included in reliable category. More complete and detail explanation about validation results is presented in this article.

Keywords: Validity; Learning devices; Cognitive conflict approach; Blended learning model

Introduction

Education has a very important role in preparing human resources to face various kinds of challenges in the future. Individual abilities and capacities are things that must be improved in the challenges of the 21st century (Jailani et al. 2017). One of the government's efforts to meet the challenges of the 21st century to improve the quality of education in Indonesia is to implement the 2013 curriculum. The 2013 curriculum facilitates students to develop thinking skills from LOTS to HOTS (Jailani et al. 2017). Permendiknas No. 22 of 2006 states that mastering concepts and developing thinking skills are part of the objectives of learning physics.

Physics learning in schools shows that teachers have not facilitated students to develop mastery of concepts and their critical thinking skills. Learning in schools is still focused on formulas, not concepts. In addition, learning resources are one of the inhibiting factors for achieving learning objectives. Teachers have not been able to develop learning tools that involve the

active role of students. This is the most influential factor on the lack of critical thinking skills of students so that it has an impact on the low mastery of concepts.

In addition, the presence of COVID-19 is also one of the obstacles to learning in schools. Learning that was originally done in class must be done online. Although some students have entered school. However, face-to-face lessons are still limited to apply the health protocol to the maximum so that a new learning process is needed to overcome this problem.

Mastery of concepts in science learning is a very important thing that must be owned by students (Yuliani & Saragih, 2015). Errors in basic concepts that students receive make it difficult to solve problems. Critical thinking is one part of higher order thinking skills. Someone who has the ability to think critically not only solves problems but also provides reasons for solving these problems (Yuliani & Saragih, 2015).

Learning devices are learning resources that are arranged in such a way that educators and students carry out learning activities (Tanjung & Nababan, 2018; Prasetyo & Senam, 2011). Learning devices serve as

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guidelines in the implementation of learning so that learning becomes more effective and efficient (Trianto, 2011). Learning devices are very important in supporting learning activities, including in learning physics.

Many studies done about cognitive conflict and blended learning model. Cognitive conflict approach successfully improves mastery of physics concepts of students (Larasafitri et al, 2018). Cognitive conflict approach has been combination with learning model, and it has a positive impact to students' critical thinking skills (Lestari et al, 2019). Blended learning can integrated in learning devices and had a positive impact on science learning (Gunawan et al, 2021). Based on the problems above, it is needed learning that requires students to develop mastery of concepts and critical thinking ability. Learning physics using cognitive conflict-based devices in the blended learning model is an alternative because it is contextual in nature with direct investigation by students so that it will stimulate students to think critically and increase mastery of concepts.

Method

This study is a research and development. This research procedure uses a 4D development model. This model was first discovered by Thiagarajan et al. (1974). This model initially contains procedures for developing teaching materials for prospective teacher students so that the initial focus of this model is in the field of education. This model consists of 4 steps, namely: define, design, develop, and disseminate. The develop stage includes validation, revision, and testing activities. Validation by experts is the stage of testing of the developed learning devices. The developed learning device developed will go through a validation process by three experts. Assessment from the three experts is very important to be used as input and references in the development of learning devices. The form of the used instrument is a validation sheet. The validation sheet will assess the validity of the lesson plans, learning materials, worksheets, concept mastery tests and critical thinking ability tests. The percentage of validation results from experts is calculated using Formula 1: (Arikunto, 2010)

$$PV = \frac{\text{score from validator}}{\text{total score}} \times 100\% \tag{1}$$

The values from three experts will be added up to get the average percentage. Validity criteria are determined based on the following Table 1.

Table 1. Validity Criteria

Range of Percentage Value	Category
0-20	Very not suitable
21-40	Not suitable
41-60	Suitable enough
61-80	Suitable
81-100	Very suitable

The aspect that assessed by validator were the content, presentation, and language in learning devices. The reliability of learning devices based on experts' agreement of assessment in validation. The reliability is calculated from Percentage of Agreement (PA) (Borich, 1994). The results are reliable if scored 75%-100% of reliability.

$$PA = 1 \frac{A - B}{A + B} \times 100\% \tag{2}$$

Result and Discussion

The results of this lesson plans (RPP) validation include the validation results from validator and reliable results based on the percentage of agreement. The results of this validation in detail can be seen in Table 2.

Table 2. Results of RPP Validation

Aspects	Average	Category
Contents	84.56%	Very suitable
Presentation	81.11%	Very suitable
Language	86.67%	Very suitable

Based on the criteria, RPP validation is in the range of values 81-100% so it is said to be "very suitable" for learning. These results were obtained from various aspects of the assessment in product validation, namely: content, presentation, and language aspects. Then the results of the reliability of the lesson plans can be seen in Table 3.

Table 3. Result of RPP Reliability

Aspects	Percentage of Agreement	Category
Contents	93.06%	Reliable
Presentation	95.94%	Reliable
Language	95.60%	Reliable

Based on the table above, lesson plans reliability results are in the range of values of 75%-100% so it can be said reliable based on aspects of content, presentation, and language. The results of learning materials validation include the validation results from validator and reliable results based on the percentage of agreement. The results of this validation in detail can be seen in Table 4.

Table 4. Results of learning materials Validation

Aspects	Average	Category
Contents	83.81%	Very suitable
Presentation	83.33%	Very suitable
Language	83.33%	Very suitable

Based on the criteria, learning materials validation is in the range of values 81-100% so it is said to be "very suitable" for learning. These results were obtained from various aspects of the assessment in product validation, namely: content, presentation, and language aspects. Then the results of the reliability of the learning materials can be seen in Table 5.

Table 5. Result of learning materials reliability

Aspects	Percentage of Agreement	Category
Contents	96.83%	Reliable
Presentation	96.05%	Reliable
Language	94.50%	Reliable

Based on the table above, learning materials reliability results are in the range of values of 75%-100% so it can be said reliable based on aspects of content, presentation, and language. The results of students' worksheet validation include the validation results from validator and reliable results based on the percentage of agreement. The results of this validation in detail can be seen in Table 6.

Table 6. Results of students' worksheet Validation

Aspects	Average	Category
Contents	86.22%	Very suitable
Presentation	83.33%	Very suitable
Language	83.33%	Very suitable

Based on the criteria, student's worksheet validation is in the range of values 81-100% so it is said to be "very suitable" for learning. These results were obtained from various aspects of the assessment in product validation, namely: content, presentation, and language aspects. Then the results of the reliability of the student worksheets can be seen in Table 7.

Table 7. Result of students worksheet reliability

Aspects	Percentage of Agreement	Category
Contents	94.44%	Reliable
Presentation	98.15%	Reliable
Language	98.15%	Reliable

Based on the table above, students worksheet reliability results are in the range of values of 75%-100% so it can be said reliable based on aspects of content, presentation, and language. The results of mastery

concept instrument validation include the validation results from validator and reliable results based on the percentage of agreement. The results of this validation in detail can be seen in Table 8.

Table 8. Results of mastery concept instrument Validation

Aspects	Average	Category
Contents	83.33%	Very suitable
Presentation	84.44%	Very suitable
Language	86.67%	Very suitable

Based on the criteria, critical thinking ability instrument validation is in the range of values 81-100% so it is said to be "very suitable" for learning. These results were obtained from various aspects of the assessment in product validation, namely: content, presentation, and language aspects. Then the results of the reliability of the student worksheets can be seen in Table 9.

Table 9. Result of mastery concept instrument reliability

Aspects	Percentage of Agreement	Category
Contents	96.30%	Reliable
Presentation	91.98%	Reliable
Language	96.30%	Reliable

Based on the table above, mastery concept instrument reliability results are in the range of values of 75%-100% so it can be said reliable based on aspects of content, presentation, and language. The results of critical thinking ability instrument validation include the validation results from validator and reliable results based on the percentage of agreement. The results of this validation in detail can be seen in Table 10. Based on the criteria, critical thinking ability instrument validation is in the range of values 81-100% so it is said to be "very suitable" for learning.

Table 10. Results of critical thinking ability instrument Validation

Aspects	Average	Category
Contents	82.77%	Very suitable
Presentation	86.67%	Very suitable
Language	90.00%	Very suitable

These results were obtained from various aspects of the assessment in product validation, namely: content, presentation, and language aspects. Then the results of the reliability of the critical thinking ability can be seen in Table 11.

Table 11. Result of critical thinking ability instrument reliability

Aspects	Percentage of Agreement	Category
Contents	95.51%	Reliable
Presentation	92.59%	Reliable
Language	92.59%	Reliable

Based on the table above, critical thinking ability instrument reliability results are in the range of values of 75%-100% so it can be said reliable based on aspects of content, presentation, and language.

Conclusion

Learning devices based on cognitive conflict approach in blended learning model obtain results that said "very suitable" in validation. This validation is assessed by 3 experts. Criticisms and advice from experts are used for repairing learning devices. The results are reliable too. It means all assessment from validator is not contradicting. The learning devices can be used for learning in school.

References

- Arikunto, S. (2010). *Prosedur Penelitian*. Jakarta: Rineka Cipta.
- Borich, G. D. (1994). *Observation skills for effective teaching*. New York.
- Gunawan, G., Jufri, A. W., Nisrina, N., Al-Idrus, A., Ramdani, A., & Harjono, A. (2021). Guided inquiry blended learning tools (GI-BL) for school magnetic matter in junior high school to improve students' scientific literacy. In *Journal of Physics: Conference Series* 1747(1), 012034. <http://dx.doi.org/10.1088/1742-6596/1747/1/012034>
- Jailani, J., Sugiman, S., & Apino, E. (2017). Implementing the Problem-Based Learning in Order to Improve the Students HOTS and Characters. *Jurnal Riset Pendidikan Matematika* 4(2), 247-259. <http://dx.doi.org/10.21831/jrpm.v4i2.17674>
- Larasafitri, M. N., Sutrio, G., & Gunawan, G. (2018). Pengaruh Pendekatan Konflik Kognitif Terhadap Penguasaan Konsep Fisika Peserta Didik. *Jurnal Pendidikan Fisika dan Teknologi*, 4(1), 66-71. <https://doi.org/10.29303/jpft.v4i1.535>
- Lestari, P. A. S., Gunawan, G., & Kosim, K. (2019). Model pembelajaran discovery dengan pendekatan konflik kognitif berorientasi pada kemampuan berpikir kritis peserta didik. *Jurnal Pendidikan Fisika dan Teknologi*, 5(1), 118-123. <https://doi.org/10.29303/jpft.v5i1.1161>
- Prasetyo, Z. K., & Senam, W. I. (2011). *Pengembangan Perangkat Pembelajaran Sain Terpadu untuk*

Meningkatkan Domain Kognitif, Keterampilan Proses, Kreativitas dan Penerapan Konsep Ilmiah Siswa. Laporan Penelitian. Yogyakarta. UNY.

- Tanjung, H. S., & Nababan, S. A. (2018). Pengembangan Perangkat Pembelajaran Matematika Berorientasi Model Pembelajaran Berbasis Masalah (Pbm) Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa Sma Se-Kuala Nagan Raya Aceh. *Genta Mulia: Jurnal Ilmiah Pendidikan*, 9(2), 56-70. Retrieved from <https://ejournal.stkipbbm.ac.id/index.php/gm/article/view/168>
- Thiagarajan, S., Semmel, D. S & Semmel, M. I. (1974). *Instructional Development for Training Teachers of Exceptional Children*. Minneapolis, Minnesota: Leadership Training Institute/Special Education, University of Minnesota.
- Trianto. (2011). *Mendesain Model Pembelajaran Inovatif-Progresif: Konsep, Landasan dan Implementasinya pada Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Jakarta: Kencana.
- Yuliani, K., & Saragih, S. (2015). The Development of Learning Devices Based Guided Discovery Model to Improve Understanding Concept and Critical Thinking Mathematically Ability of Students At Islamic Junior High School of Medan. *Journal of Education and Practice*, 6(24), 116-128. Retrieved from <https://eric.ed.gov/?id=EJ1078880>