

The Development of Teaching Materials Based on Quantum Teaching Model Using Lectora Inspire

Nana Sutarna^{1*}

¹Department of Primary School Teacher Education, STKIP Muhammadiyah Kuningan

*nana@upmk.ac.id

Abstract. This study aims to find out how to design teaching materials based on quantum teaching models using lectora inspire interactive media. The research method used is the Borg & Gall Research and Development Method with the steps of preliminary study, planning, product design, product design validation, product testing and final product results. The research was conducted in six face-to-face meetings, based on the analysis of the needs of grade V elementary school students in Kuningan. Validation of teaching material product design was carried out by four expert teams as validators which produced a score of 86.45% with very good assessment criteria. Readings from the results of book tests by students obtained a score of 88. The results of product trials obtained very good criteria, namely teacher practicality response 91.67% and practicality of student responses 86.57%. In conclusion, quantum teaching model-based teaching materials use interactive media lectora inspire valid and practical to use.

1. Introduction

The rapid development of science and technology must be balanced with human skills and abilities as users of science and technology. Tinio suggested four skills needed in the world of work in the future, one of which is a high-level thinking skill. If there are four categories specified higher level thinking that solving (*problemsolving*), decision making (*decision making*), critical thinking (*critical thinking*), and creative thinking (*creativethinking*) [1]. To be able to solve problems creatively and logically, students need to be equipped with critical thinking skills. Educational reform is expected to produce graduates who are smart, creative, innovative, active, and think critically.

Given the importance of critical thinking skills, it is necessary to encourage the improvement of students' abilities through effective learning models. The model *quantum teaching* can be an alternative to use. Quantum Teaching consists of two words "Quantum" and "Teaching". The word of Quantum is borrowed from the physics of the world which means the interaction that converts energy into light. In Quantum, systems show variation, clearness, complexity, mutual causality and uncertainty, reflecting qualitative changings more than quantitative changings [2]. *Quantum teaching* is analogous to orchestration, where a variety of interactions exist in and around the learning moment. These interactions include elements for effective learning that affect student success. Quantum Teaching focuses on dynamic relationships in a classroom environment. The dynamic relationship that meant is the interaction that establishes a foundation and framework for learning [3].

The expert who sparked this theory, Deporter said that *quantum teaching* is a learning methodology used by teachers to design and present interesting learning processes by involving elements that influence student success in learning and focus on dynamic relationships in the classroom environment [4]. The elements in question include the ability of students to think critically about something that happens in learning which includes how to solve problems, how to make decisions, analyze opinions and learn with new concepts.



Gunarhadi say that Quantum teaching-learning begins with a strong belief foundation that: all people can learn, people learn differently, and learning is effective when it is joyful, engaging, and challenging [5].

Suparmono in his research revealed that the main foundation in learning *quantum* is to bring the world of students to the world of educators and deliver the world of students to the world of educators so as to signal the importance of an educator entering the world or the lives of students as a first step in carrying out learning. The role of the teacher as an educator becomes the central role that the teacher is one of the factors that influence the learning process consisting of internal and external factors. Internal factors in question are factors related to the personal teacher. Activity of learning with Quantum Teaching concepts which use variety of concepts such as speech, questioner and discussion, demonstration, work group, experiment, and giving task method [6]. Quantum teaching can encourage learning success, this is evidenced by the results of Lavenia Ulandari's research that learning with Quantum Teaching Model can improve students learning outcomes [7]. But quantum teaching not only improves learning outcomes, but can also stimulate the development of attitudes. As the results of research conducted by Bahaddin, the quantum learning model does not only contribute to the academic achievement of students but also to the development of their attitudes [8].

The Quantum Teaching Model has a design framework known as TANDUR abbreviation which means: Grow (plant to grow), Natural (Experience / live), Name (giving name) Demonstrate (show), Repeat (R) and Celebrate [9].

The era of the industrial revolution 4.0 pushed the learning process in schools to be able to use technology. Active learning can be carried out well, teachers can use IT programs to deliver teaching material to students as a stimulus in learning. Currently the development of IT in the world of education has increasingly advanced. Learning technology, which currently has applications in the form of utilizing information and communication technology (ICT) processes and products to solve educational and learning problems, has many benefits or advantages. Many software that supports the making of learning media, one of which is *Lectora Inspire*.

Lectora inspire is an effective program in making learning media and is an electronic learning development software (e-learning) that is relatively easy to apply or apply because it does not require an understanding of sophisticated programming languages. *Lectora inspire* has an interface that is familiar to those of us who have known and mastered Microsoft Office [10]. Learning by e-learning can improve learning activities and outcomes, as the research conducted by Oktavianingtyas that interactive learning using *lectora inspire* media can improve student learning activities and outcomes [11]. Another study was carried out by Nasution whose results proved that the implementation of *Lectora Inspire* media can improve students' cognitive values [12]. Furthermore Simorangkir applies *lectora inspire* to mathematics learning in elementary schools [13]. The result is *Lectora Inspire* learning media is effectively used to improve students' number sense abilities. Research on the use of *Lectora Inspire* in learning was also carried out by Irwandani who produced a product in the form of interactive learning based on multimedia *Lectora Inspire* model based on learning problem [14].

The purpose of this research is to develop teaching materials based on the quantum teaching model based on the *Lectora Inspire* application that can be used in 2013 curriculum learning for grade V elementary school students in Kuningan District.

2. Research Methods

Phase of the study begins with the development of products based teaching materials based models of *quantum* aided *inspire lectora* based on the research and development of design modifications of the procedure Borg & Gall. Research data can be in the form of quantitative and qualitative data. Quantitative data is data obtained from the scores of each data analysis such as the validity test and practicality test. Qualitative data is data obtained from the results of teacher and student interviews. Furthermore, the effectiveness of teaching material products is tested to improve students' critical thinking skills with quasi-experimental methods in the experimental class and the control class.

Collection techniques using questionnaires, tests, interviews and documentation. Data collection tools used for questionnaires in the form of a needs analysis questionnaire, product validity questionnaire, practicality test questionnaire for teachers and students. In this legibility test there are 15 words that are omitted and must be completed by each student. Interviews were conducted with teachers and students

both at the beginning of the study to analyze the needs and at the end to evaluate the teaching material products. Documentation in the form of photos and supporting documents to provide an overview of the use of teaching material products.

The data analysis technique used is descriptive analysis. Overall data is classified into two, namely quantitative and qualitative data. Qualitative data is processed by grouping information in the form of inputs, suggestions, responses and criticisms contained in data collection instruments, while quantitative data obtained through questionnaires are then added or grouped according to the instruments used in the form of descriptive percentages.

The development of teaching materials products based on the quantum model of teaching assisted by Lectora Inspire is based on a modification of the Borg & Gall procedure. The steps of the development research model are as follows: (1) Preliminary Study, namely that this research departs from a potential problem or problem. All problems that arise are identified. At this stage literature studies and information gathering are also carried out; (2) Planning, consisting of choosing a design based on needs analysis so that the product to be produced is truly appropriate and needed in learning. Then proceed with preparing a draft of teaching materials and making product feasibility instruments; (3) Product Design, i.e. making teaching material product designs based on quantum teaching models; (4) Product Design Validation, containing a review of the material / content experts and teaching material experts then proceed with the initial product revision process; (5) Product trials are conducted to determine the quality and effectiveness of the products that have been made so that it can know what things need to be repaired / perfected; and (6) Final Product, is the result of a series of product manufacturing processes [15].

3. Result and Discussion

3.1. Results of Analysis of Needs

Analysis of teacher needs to pay attention to include four aspects, namely (1) aspects of material needs; (2) aspects of book presentation requirements (3) language aspects and supporting illustrations of books; and (4) physical needs / graphic books. Based on these four aspects the researcher obtained 30 statements of the tendency of teacher answers that the percentage of answers above 60%.

Analysis of student needs for teaching materials based on models *quantum teaching* includes four aspects, namely (1) aspects of material needs; (2) aspects of book presentation needs; (3) linguistic aspects and supporting illustrations of the book; and (4) physical needs / graphic books. Based on these four aspects the researcher obtained twenty statements of the tendency of student answers to which the percentage of answers was above 60%. The results of the needs analysis in the form of thirty tendencies of teacher answers and twenty tendencies of student answers that form the basis of researchers in preparing teaching material products.

3.2. Learning Media Using Lectora Inspire

Teaching material created is collaborated with ICT learning media using lectora inspire. The lesson this time, the object of research is a fifth grade student with the material in Theme 8 Subtheme 3 "Environmental Conservation Efforts". Examples of instructional media can be seen in the picture below.



Figure 1. Learning using Lectora Inspire

3.3. Initial Product Design, Validity Test Results and Practical Test

Based on the results of the needs analysis, then the initial design of the teaching material product is then arranged. Then the validation test is carried out with design validation. Design validation is a process of evaluating product design that is carried out by providing an assessment based on rational thinking, without field trials. The validation test of teaching materials involved three experts and one practitioner. This was done so that the revision stage would not only heed the advice of experts but also heed the advice of practitioners as supervisors for the use of the developed product. The results of the validator assessment can be seen in Table 1.

In addition to expert validation, the researcher also conducted a readability test for teaching materials conducted on grade V students of SDN 3 Cengal Kuningan. In this legibility test there are 15 words that are omitted and must be completed by each student. The results of the analysis of teaching materials in the study showed that the readability in this textbook was easily understood with an average student score of 88. Thus, the teaching material was stated to be used with easy readability criteria.

The practicality test also paid attention to students' responses, conducted by giving questionnaires to grade V students of SDN 3 Cengal Kuningan taking a sample of 24 students. The questionnaire sheet contains 15 items representing seven aspects, namely book covers, book titles, additional menus, questions and exercises, content eligibility, language, and presentation. Based on the results of the questionnaire analysis it was found that students' responses to teaching materials were very practical with a percentage of 86.57%.

Table 1. Recapitulation of the Validator Assessment Results for Teaching Materials

No	Aspect	Score	Category
1	Book Cover	96,87%	Very Valid
2	Book Anatomy	87,50%	Very Valid
3	Book title	84,38%	Very Valid
4	Contents	85,98%	Very Valid
5	Additional Menu	75,00%	Valid
6	Questions and Exercises	87,50%	Very Valid
7	Eligibility Content	85,98%	Very Valid
8	Language	83,75%	Very Valid
9	Presentation	83,75%	Very Valid
10	Graphic	93,75%	Very Valid
Average		86,45%	
Conclusions			Very Valid

3.4. Final Product

In the final stage of product development, the researcher makes a final revision according to the results of the validity and practicality test by taking into account the results of the interview. The following researchers present an example of the final product of teaching material.



Figure 2. Examples of Final Product Design Teaching Materials

4. Conclusion

The results of research and development in the form of teaching material products based on models quantum teaching using lectors inspire to improve critical thinking skills for students are valid and practically used. Expert validation test results are 86.45% with a very valid category. The readability test results of teaching materials amounted to 88. The practical test results of students' responses to teaching materials were very practical with a percentage of 86.57%.

References

- [1] Tinio, V.L. 2003. *ICT in Education*. [Online]. available at: <http://www.apdip.net/publications/iespprimer/ICTinEducation.pdf> (18 April 2019).
- [2] Bahaddin, Yusuf, et al. 2014. *An Investigation the Effect of Quantum Learning Approach on Primary School 7th Grade Students' Science Achievement, Retention and Attitude*. Educational Research Association The International Journal of Research in Teacher Education, 5(2): 11-23 ISSN: 1308-951X.
- [3] Rumapea, Goman. 2017. *Application of Quantum Teaching Learning Model to Improve Student Learning Outcomes*. International Journal of Novel Research in Education and Learning Vol. 4, Issue 2, pp: (118-130), Month: March – April 2017.
- [4] DePorter, Bobbi. 2011. *Quantum Teaching*. Bandung: Kaifa Learning.
- [5] Gunarhadi. 2014. *The Impact of Quantum Teaching Strategy on Student Academic Achievements and Self-Esteem in Inclusive Schools*. Malaysian Journal of Learning and Instruction: Vol. 11: 191-205, 2014.
- [6] Rachmawati, Rima. 2012. *The Implementaton Quantum Teaching Method of Graduate Through Up-Grade Hard Skill And Soft Skil*. Elsevier Ltd. Selection and/or peer-review under responsibility of the Asia Pacific Business Innovation and Technology Management Society (APBITM) 1877-0428.

- [7] Lavenia Ulandari & Edy Surya. 2017. *Improving Learning Outcomes of Linear Program with Quantum Teaching Model at Grade X Students SMK-BM a,b PAB 3 Medan Estate*. International Journal of Sciences: Basic and Applied Research (IJSBAR) (2017) Volume 33, No 3, pp 120-129
- [8] Bahaddin, Yusuf, et al. 2014. *An Investigation the Effect of Quantum Learning Approach on Primary School 7th Grade Students" Science Achievement, Retention and Attitude*. Educational Research Association The International Journal of Research in Teacher Education, 5(2): 11-23 ISSN: 1308-951X.
- [9] Deslauriers, L., & Wieman, C. 2011. *Learning and Retention Quantum Concepts with Different Teaching Method*. Journal of Physisc Education Research , 7 (1), 1-6.
- [10] Mas'ud, Muhammad. 2012. *Membuat Mulimedia Pembelajaran dengan Lectora*. Yogyakarta: Pustaka Shonif.
- [11] Oktavianingtyas et al. 2018. *Development 3D Animated Story as Interactive Learning Media with Lectora Inspire and Plotagon on Direct and Inverse Proportion Subject*. MISEIC 2018 IOP Conf. Series: Journal of Physics: Conf. Series 1108 (2018) 012111 doi :10.1088/1742-6596/1108/1/012111.
- [12] Nasution, Rahmadina et al. 2018. *The Influence of Problem Based Learning, Guided Inquiry Learning Models Assisted by Lectora Inspire, and Scientific Attitudes to Student's Cognitive Values*. Advances in Social Science, Education and Humanities Research, volume 200. 3rd Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2018).
- [13] Simorangkir, Frida Marta Argareta & Sembiring, Ribka Kariani Br. 2018. *Effectiveness of Helped Mathematical Learning Media of Lectora Inspire on The Number Sense Ability of Fifth Grade Students of Elementary School in Substrate Materials*. Budapest International Research and Critics Institute-Journal (BIRCI-Journal) Volume I, No 3, October 2018, Page: 352-358 e-ISSN: 2615-3076(Online), p-ISSN: 2615-1715(Print).
- [14] Irwandani, et al. 2019. *Interactive Multimedia Lectora Inspire Based on Problem Based Learning: Development in The Optical Equipment*. YSSTEE2018 IOP Conf. Series: Journal of Physics: Conf. Series 1155 (2019) 012011 IOP Publishing doi:10.1088/1742-6596/1155/1/012011.
- [15] Creswell, J. W. 2014. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches (4th ed.)*. Thousand Oaks, CA: Sage