The content quality of teacher’s pedagogical and professional competence standards of senior high school physics teacher guide books

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Abstract. The teacher guide book has an important role in supporting the implementation of the 2013 curriculum. The using of qualifying teacher guide book has a major impact on the success of the learning process. The book should support teachers developing pedagogical and professional competence because both of these competencies are indicators of basic teaching abilities of a teacher. This study aims to determine the quality of pedagogical and professional competence content of four senior high school physics teacher guide books. The instrument used is assessment rubric that developed based on pedagogical and professional competence standards of teacher. The assessment was conducted by four experts from LPTK and two physics teachers. The results of the assessment can be concluded that the fourth of teacher guide books generally are in sufficient categories both of pedagogical and professional competence. However, there are some both of the competence standards that have not been met in each book. One of the limitations on the standard of professional competence is creativity in the development and presentation of learning materials. Therefore, still needed improving and developing of the teacher guide book in order that can provide further pedagogical and professional competence of teacher.

1. Introduction

Teacher is the key to the success of education because they act as the most important source in the learning process. The role of teacher is very strategic in term of teaching and learning process as they will bring consequence in performing their duties professionally. A professional teacher should have good professional competence because it has a positive influence on teacher’s performance [1]. Teachers who have good performance will give positive correlation to the output that resulted. Therefore, teachers should always be facilitated to improve their professionalism. Professional
development of teachers in the 21st century requires the reinforcement of some domains of knowledge, namely pedagogic, content and technology in education. Teachers need to continuously improve their knowledge and skills in order than to make students learn effectively [2]. The Government has made efforts to improve teachers' professional through various activities, including through training activities to improve both of teachers' pedagogical and professional competence. However, the geographical position of Indonesia which is an archipelago country can be one of the constraints of time and cost limitation, even if not all of teachers have the opportunity to follow these activities. Meanwhile, the reality in the field showed that not all of teachers are graduated from LPTK and not all LPTK have the same quality of graduates. Therefore, in addition to training activities are also needed other efforts that can help increasing the competence of teachers to realize the goal of national education on the whole.

One of the efforts that can be done by the government related to the professionalism improvement of teachers is providing quality teacher guide book for teachers. It can be increase the competence of teachers continuously which will directly impact on the quality of learning. Book is the main source that teachers use in guiding them to teach the content and skills specified in the curriculum. Because teachers use the book as curriculum guidance and source for learning preparation, so the quality of the book has a major impact on the quality of its learning [3,4]. The using of quality teacher guide book is a more appropriate solution to do other than the form of trainings. The using of teacher guide book appropriately will give profound direct effect on the learning process. Providing the quality teacher guide book is relatively easy, cheap and quick compared to other activities [5].

Given the important role of teacher guide book in helping teachers to satisfy the demands of the 2013 curriculum, several teacher guide books have been published and used by teachers in Indonesia. The teacher guide books that circulated have been passed through the assessment by BSNP, but the assessment was done just on the quality aspect of the book, linguistic, presentation and legibility [6]. Whereas, in addition to that aspects, there are other aspects that need attention, namely the aspect of pedagogic and professional competence standards that must be provided in the teacher guide book in order to it can be more help teachers in improving those competencies. It is reinforced by the opinion that the quality teacher guide book is a book that offers significant and principal assistance to teachers in developing their professionals which includes pedagogical and professional competence [4,7,8]. For that reason, the study to analyze of teacher guide books that have been published and used by teachers in Indonesia in terms of teacher’s pedagogical and professional competence standard is necessary. It is to be very important to help teachers to satisfy the demands of teacher’s competence standards appropriately because it will have direct impact on the quality of learning.

The study results of the teacher guide book can be used as a reference and consideration in the development of senior high school Physics teacher guide book to improve teachers’ competence according with the demands of 21st century learning. Furthermore, the research results can also be recommendation for teachers in choosing and using the appropriate teacher guide books in their learning process.

2. Experimental method
This study aims to determine the content quality of teacher’s pedagogical and professional competence standards of senior high school Physics teacher guide book of tenth grade. The study is important to determine how far the teacher guide book can facilitate or support the demands of teachers’ pedagogical and professional competence. The research used qualitative-descriptive method. The research documents are four of senior high school Physics teacher guide book which have been circulating widely in the field. The data were obtained by using an assessment rubric developed based on teacher’s pedagogical and professional competence standards, including 10 pedagogic competence standards, and five professional competence standards [9]. The analysis of teacher guide book was conducted by four experts from LPTK and two physics teachers. The research data analyzed using descriptive statistics in form of percentages [10], and then it interpreted by the following categories: excellent (91% - 100%), good (76% - 90%), sufficient (61% - 75%), and less (≤ 60%).
3. Result and discussion

3.1. The content quality of pedagogical competence standards

The analysis result of content quality of pedagogical competence standards in senior high school physics teacher guide book of tenth grade using assessment rubric developed from teacher’s pedagogical competence standards can be shown in Table 1.

| Competency Standards measured                                      | Average of Score (%) |
|---------------------------------------------------------------------|-----------------------|
|                                                                      | Book 1 (YW) | Book 2 (IP) | Book 3 (IP) | Book 4 (BA) |
| Mastering the characteristics of learners                          | 63          | 31          | 56          | 56          |
| Mastering the theory of learning and the principles of learning    | 63          | 50          | 75          | 63          |
| Developing a curriculum                                            | 75          | 67          | 88          | 83          |
| Conducting learning                                                | 63          | 66          | 78          | 78          |
| Utilizing ICT for learning                                         | 75          | 100         | 50          | 75          |
| Facilitating the development of potential learners                  | 88          | 100         | 88          | 81          |
| Communicate effectively, empathically, and well-mannered with learners | 38          | 38          | 38          | 38          |
| Conducting assessment of learning processes and outcomes           | 93          | 45          | 75          | 93          |
| Utilizing assessment results for learning purposes                  | 69          | 50          | 75          | 50          |
| Doing reflective action to improve the quality of learning         | 50          | 63          | 75          | 63          |
| **Average**                                                         | **67**      | **61**      | **70**      | **68**      |

Table 1 shown the content quality of pedagogical competence standard in the four of teacher guide books is in the sufficient categories. However, in each book still found competency standards that are still in fewer categories so that the books still need to be revised and developed.

Based on the findings of research results, the pedagogical competency standards that need to be developed in the Physics teacher guide books, namely: First, master the characteristics of learners. Book 2, 3, and 4 do not provide these standard of competence, while in the learning of the teacher must pay attention to aspects of intellectual, talent, interest and student background. It is intended to facilitate the interaction between teachers and students so that learning objectives can be achieved as expected [1].

Second, utilize ICT for learning. Book 3 does not guide teachers to utilize ICT in the learning, while teachers are required to have ICT skills in order to create meaningful learning. In parallel, the ability to integrate ICT into classroom teaching and learning continues to be a challenging task for many teachers [11,12]. When teachers integrate technology into teaching, students become more interested in learning [13,14].

Third, communicate effectively, empathically, and courteously with learners, where all books do not provide guidance related to the competency standard. The standard of competence to communicate effectively, empathically, and courteously with the learners is important for the teacher because one of the teacher's role in learning is as a communicator where the teacher should be able to communicate the subject matter in verbal and non-verbal form, using polite language and easily understood by students [15]. Communication and language skills are emphasized by several teaching strategies because they are an important component of students' science learning [16].

Fourth, conducting assessment of process and learning outcomes. Book 2 does not provide guidance on these competency standards, while assessments in the learning process are important for
educators to achieve student competency standards and to monitor progress and improvement of learning outcomes continuously [17]. The role of assessment in higher education is important and increasingly recognized as having potential to improve the teaching and learning process [18].

Fifth, utilize the assessment results for the importance of learning. Books 2 and 4 do not provide guidance for teachers to how to use the assessment results for the importance of learning as it is demanded by curriculum, namely to assess student achievement, develop progress reports on learning outcomes and to improve the learning process [19].

Sixth, do reflective action to improve the quality of learning. Book 1 does not provide the guidance for this standard, while reflective action is needed to analyze what has been done in the learning process so that it can find the advantages and disadvantages of learning implementation which becomes a contribution in developing the next learning.

3.2. The content quality of professional competence standards
The content quality of professional competence standards in senior high school physics teacher guide book of tenth grade using assessment rubric developed from teacher’s professional competence standard can be shown in table 2.

| Competency Standards measured | Book 1 (YW) | Book 2 (IP) | Book 3 (IP) | Book 4 (BA) |
|-------------------------------|-------------|-------------|-------------|-------------|
| Mastering the material, structure, concepts, and mindset of science | 63 | 73 | 56 | 63 |
| Mastering the standard of competence and basic competence of subjects | 94 | 50 | 75 | 94 |
| Developing learning materials creatively | 38 | 50 | 38 | 38 |
| Developing professionalism continuously | 50 | 100 | 50 | 100 |
| Utilizing ICT to develop themselves | 56 | 88 | 50 | 69 |
| **Average** | **60** | **72** | **54** | **73** |

Table 2 shown the average of quality of professional competency content of book 2 and 4 is in the sufficient category, whereas book 1 and 3 are in the fewer categories.

In each book still found competency standards that need to be revised and developed because they are still in the fewer categories, namely: First, master the material, structure, concepts, and mindset of science. Book 3 does not provide a description of the required teaching materials related to the competency standard. While in other books, the presentation of the teaching material is less profound. The quality of teaching materials is very important for teachers and students [8]. The quality and accuracy of the content is crucial to the effectiveness of learning [20]. Mastery of the material is important because the lack of content knowledge becomes an obstacle for teachers to understand students’ difficulties on certain topics, and in uncovering things that can motivate learners’ learning [21]. In parallel, a teacher is one of the important elements that must be responsible to learn the certain subject matter properly and correctly [22].

Second, master the competency standard and basic competence of subjects. Book 2 does not explain the standard of competence, while teachers are required to understand SK and KD in order to be able to learn students in accordance with the demands of competence contained in SK and KD to be achieved by students [19].

Third, develop learning materials creatively. The findings show that the development of learning materials in all the books is still less creative because in general only in the text and images form so that the material less stimulate the thinking and reasoning of teachers. Existing images tend to be less relevant with the explanations of text given. Though, the development of learning materials is very important because the material presented in interesting and appropriately can help teachers in
deepening the content knowledge [21]. Learning materials in teacher books should be relevant, accurate and innovative [23-26].

Fourth, develop professionalism in a sustainable manner. Books 1 and 3 only use the book as a source of learning so that teachers less to follow the progress of the times by learning from various sources, especially the form of the Internet that provides up-to-date and innovative information. Teachers must have up-to-date and innovative knowledge [25,26].

Fifth, utilize ICT to develop them. Books 1 and 3 do not provide the standard of competence, while teachers are required to develop themselves by continuing to follow the development of science and technology to prepare the skills of the 21st century. ICT literacy is one of the 21st century skills that must teachers have in order to be able to teach that skill to their students [27]. Knowledge of the using effectively of educational and communication technologies has become an important aspect of the educators based knowledge for the 21st century [28]. How can teachers prepare 21st century skills on their students, if the skills they possess are nineteenth-century skills [29]?

3.3. The generally content quality of teacher’s pedagogical and professional competence standards
The generally content quality of teacher’s pedagogical and professional competence standards of the fourth of books can be shown in Figure 1.

![Figure 1](image-url)

**Figure 1.** The generally percentage average of teacher’s competency

Figure 1 shown that generally both of pedagogical and professional competences in the four books are in the sufficient categories by its percentage average is 66% and 65% respectively. Based on the analysis results known that the four books have advantages and limitations of each book both of pedagogic and professional competence standards.

4. Conclusion
Based on the result of data analysis, it can be concluded that generally the quality of teacher’s pedagogical and professional competence standard content of four teacher guide books is in the sufficient category by its percentage average are 66% and 65% respectively. Each book has different advantages and limitations. Because there are standards of competence that have not been fulfilled in each book, so it is necessary to make improvement and development of the four books so that can further assist teachers in improving pedagogical and professional competence as demand on Academic Qualification Standards and Teacher Competencies.

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