

Strengthening Professional Competency on the Ability to Develop Learning Materials through Teacher Professional Education

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Abstract. Graduates of teacher professional education are awarded a certificate of educator as a sign that they have become professional teachers. The present research focuses on the professional competency of teachers in terms of the ability to develop geography learning materials. In particular, the research aims to determine the abilities of: (1) analyzing learning materials; (2) creating strategies to develop learning materials; and (3) designing teaching materials. The research employed a descriptive method. The variable under research is developing learning materials, with the following indicators: analysis of learning material, strategies to develop learning materials, and design of teaching materials. The subjects of the research were 20 participants of the Teacher Professional Education of Post-SM3T (a program of Scholars Teaching at the Outermost, Disadvantaged, and Frontier Regions) Batch 4, in the field of geography. The instruments used were interview guides and documentary study. Data were analyzed descriptive-qualitatively. The results of the study show that: (1) analysis of learning materials is based on content standards, basic competence, and syllabus. Learning materials are determined based on the objectives or indicators of competence attainment; (2) learning materials are developed through identification and selection of learning resources for teaching materials and supporting information sources; and (3) teaching materials are systematically designed, consisting of core and supporting components. The ability to develop geography learning materials is evidenced by documents of teaching materials produced in the Subject Specific Pedagogy Workshop.

1. Introduction

By virtue of the Law of the Republic of Indonesia No.14 of 2005, teachers occupy a strategic position in the national development to prepare democratic citizens. A teacher is a profession that serves as learning agent, carried out based on the principle of professionalism. Professional teachers must meet three requirements, namely: having undergraduate or Diploma 4 qualification, meeting standards of teacher competency, and possessing an educator's certificate. Therefore, teachers must go through teacher education, consisting of academic education and professional education [1].

Teacher professional education is an education program organized for bachelor and Diploma 4 graduates of education and non-education programs who have the talent and interest to become teachers so that they can become professional teachers after they meet certain conditions in accordance with the national standards of education and obtain a certificate of educator [2]. It is further stated that



the purpose of teacher professional education is to produce pre-service teachers who have competence in planning, implementing, and assessing learning; following up assessment results; conducting mentoring and training learners; and conducting research; as well as being able to develop sustainable professionalism.

Graduates of teacher professional education program is expected to be professional teachers that master the four competences, namely: (1) the ability to know in depth the learners they serve; (2) the mastery of the field of study in terms of science and education, which is the ability to design and deliver learning materials; (3) the ability to provide educational learning, covering: learning design, learning implementation, learning assessment, and learning outcomes, and the utilization of assessment results and learning outcomes for continuous improvement; and (4) sustainable development of professionalism [3].

Professional competency is one of the teacher competency standards closely related to academic qualification standards. Professional competency consists of five aspects, among which is developing learning materials creatively [4]. Learning materials are developed based on content standards to facilitate students to attain basic competences. Therefore, it is very important for teachers to have knowledge about learning resources and the ability to develop learning materials into teaching materials.

Learning resources are all components of the instructional system [5], both designed and utilized [6] to facilitate student learning [7], and support the attainment of learning efficiency and effectiveness [8]. Learning resources are classified into: messages, people, materials, media, techniques, and environment/settings [9], current events [10], and textbooks [11]. In teaching and learning, learning resources are used as sources of teaching materials, instructional media, learning tools, learning places, and learning objectives.

Teaching materials have several characteristics, namely: self-instructional, self-contained, stand-alone, adaptive, and user friendly [12]. Teaching materials must meet the standards, namely: systematic in accordance with content standards; containing topic development; appropriate to students' cognitive development; using appropriate language; using illustrations in accordance with the description of the materials; inculcating moral/ethics; and free of ethnic, religious, racial, and intergroup issues. Meanwhile, in terms of form, teaching materials can be in printed, audio, audio-visual, and interactive forms [11].

Department of Geography Education is one of the study programs that organize the Teacher Professional Education for alumni of SM3T Program (a program of Scholars Teaching at the Outermost, Disadvantaged, and Frontier Regions) for Batch 4 in 2016 held in UPI. Thus, it is very important to conduct a study on teacher professional competency on the ability of developing geography learning materials, which includes: analysis of learning materials, strategies to develop learning materials, and design of teaching materials.

2. Research Methods

The research employed a descriptive method. The research variable is professional competency on the ability to develop learning materials, with the following indicators: analysis of learning materials, strategies to develop learning materials, and design of teaching materials. The subjects of the study were 20 participants of Teacher Professional Education of Post-SM3T Program Batch 4, in the field of geography study. The research instruments consisted of interview guidance and documentary study. Data were analyzed descriptively through categorization of every aspect of study to gain interpretation.

3. Results and Discussion

3.1. Analysis of Learning Materials

Based on the documentary study, Teacher Professional Education of Post-SM3T Program Batch 4 was conducted in two semesters, using the "block-pattern" curriculum, to strengthen the competence of

pre-service professional teachers [1] [3]. Workshop of specific subject pedagogy (SSP) and teaching internship program in partner schools were conducted in the first and second semesters, respectively. This arrangement is in accordance with the standard process of curriculum 2013 stating that learning is carried out through planning [13], and evaluation [8].

Based on the research results, it is found that the students develop geography learning materials by referencing the content standards and syllabus. There are four steps in the analysis of learning materials, namely: (1) analyzing the basic competences, the subject matter listed on the syllabus, and learning attainments in terms of attitude, knowledge, and skill; (2) identifying and translating the subject matter into sub-topics and determining indicators of competence attainment; (3) analyzing sub-topics and formulating indicators of competence attainment; and (4) determining the outline of the materials based on indicators and or learning objectives.

Based on the standard process, the SSP workshop can be defined as an activity of planning instruction that produces learning media. The pre-service teachers are guided and trained to apply the eight principles of learning, namely: (1) learner's active participation; (2) higher order thinking; (3) the accompanying impact; (4) utilization of information technology; (5) contextual learning; (6) the use of multi-strategy and various learning resources; (7) learning by doing; and (8) feedback mechanisms (Teacher Professional Education Guide, 2016). The implementation of the learning principles is for the strengthening of professional competency, especially the abilities of critical thinking, analytical thinking, creative thinking, and utilization of information technology and learning resources in the activities of developing learning materials [4] [14].

Learning materials are listed in the curriculum [15] [16] and are one of the learning components [8] [17] to facilitate students in competence attainment. Learning itself is the interaction process between learners and teachers and learning resources in a learning environment by referencing the curriculum [18]. Thus, teachers have a strategic role in developing learning materials and processes so that students acquire optimal learning experiences and learning outcomes.

Meanwhile, based on content standards, geography subject consists of core competences and basic competences (Curriculum 2013). The subject matter for each basic competence, especially the competence on the knowledge and skills aspects is listed on the syllabus. The attitude competence is developed and integrated in the implementation of teaching and learning through the process of habituation [18]. The process of analyzing learning materials trains students to think critically and analytically to utilize information and think creatively in utilizing learning resources.

More specifically, the materials of thematic learning are concerned with accustoming pre-service teachers to analyze materials with themes derived from the environment and geographical conditions. Utilizing school parks and cultural-art environment is considered a process of habituation and can influence the formation of normative behaviors as well as assisting students in understanding the materials [19] [20] [21]. Utilizing geographic learning resources from the physical and socio-cultural environments and utilizing information technology can indeed facilitate students to optimally attain competences [9] [10].

The ability to analyze learning materials includes the knowledge and skills to identify basic competences and subject matter to determine learning materials [22]. Teacher Professional Education at the stage of SSP workshop becomes a medium of learning activities for the strengthening of the professional competency of pre-service teachers of geography subject. They gain learning experience in determining learning materials. Learning materials are determined by identifying, selecting, and defining the outline of the materials, followed by developing the outline into learning materials. The knowledge and experience reinforces the ability to plan and manage the learning program [13] [23] [24].

3.2. Strategies to Develop Learning Materials

Based on the results of documentary study, students acquire the academic ability and preparedness to carry out professional training on geography subject to strengthen their professional competency. Students' readiness is shown by the outcomes of the SSP workshop in the form of teaching materials

as part of the learning media. The teaching materials indicate that students have the ability to develop geography learning materials. Developing learning materials into teaching materials is the actualization of the ability to utilize a variety of learning resources to facilitate student learning [6] [7] [9].

The ability to develop learning materials is closely related to the ability of: (1) mastering the scientific nature, scope, and object of geography; (2) distinguishing geographical approaches; (3) mastering geographic materials in breadth and depth; and (4) showing the benefits of geography subject [4]. This knowledge is an academic ability that belongs to the category of professional competency. The knowledge and ability to develop learning materials bears some relevance to academic qualification as one of the requirements of professional teachers [24].

Teacher professional education program becomes a vehicle for the process of forming and sharpening the professionalism of pre-service teachers by engaging them actively in the development of learning materials until they are ready to take the teaching internship program [1]. The process of developing learning materials can shape creative and innovative attitudes in professional teachers. The active involvement of the pre-service teachers can increase motivation in developing learning materials, so they gain the ability and learning experience [14] [15].

The pre-service students have the ability to develop learning materials through the identification of learning resources, determining the source of teaching materials, and determining the strategies to use them as an instructional system [5] [6] [7]. The three steps are taken holistically in developing the learning materials of geography. They have to identify and classify learning resources that have the potentials to be made sources of teaching materials. They also have to select and determine the resources of learning materials to package teaching materials. Finally, they should select the resources of teaching materials to match the outline of the learning materials.

The ability to develop learning materials is based on the knowledge about learning resources and the mastery of information technology. The knowledge and skills related to learning resources include: the types, benefits, means of access, and strategies of using the sources as part of the development of learning materials [8]. The ability to develop learning materials and use appropriate utilization strategies can develop students' academic potentials, problem-solving skills, and critical and creative thinking [26] [27].

The source of geography learning is closely related to the environment, namely: (1) the physical environment; (2) socio-cultural environment; (3) engineering environment; (4) abstract environment, waste materials; and (5) natural and social events [28]. The environments have the potentials that require teachers to be able to utilize them as resources of teaching materials. The ability to identify environmental characteristics is vital considering the environment has the carrying capacity as well as obstacles for learning purposes [29].

The ability to utilize the micro and macro environments as learning resources is to facilitate students for transfer of learning [30]. Learning environment will be conducive for learning processes when teachers have the ability to manage it. Meanwhile, the ability of teachers to utilize the local environment as a source of teaching materials for the development of teaching materials can improve student competence [31] [32].

3.3. Designing Teaching Materials

Based on the results of documentary study, students create teaching materials as part of the learning media produced at the SSP workshop. Designing teaching materials is one of the steps in instructional planning (standard process) that are included in professional competency. The teaching materials designed by students facilitate student learning activities. Learning will be meaningful if students participate and actualize their abilities in learning activities [33].

The teaching materials designed by the students are written documents [10] to facilitate students in autonomous learning to attain competence. The teaching materials are designed systematically [11], consisting of core and supporting components. The supporting components consist of title or theme, basic competence, indicators/learning objectives, material outline, and learning methods. Meanwhile,

the core component consists of a description of the materials, sources of supporting information, training, and evaluation.

Furthermore, based on the results of interview, the description of the materials was developed based on the sub-themes organized systematically according to the learning objectives. The material description contains examples, images, facts, data, and concepts or theories to help learners understand the learning materials. The teaching materials contain the examples, both in the forms of pictures and events showing contextual learning [34]. The concepts and theories about the substance of learning materials must have a clear reference, as they will become academic knowledge newly acquired by students through the learning process.

In this regard, constructivism suggests that teaching materials will be meaningful if they begin with the materials that the students already know. Based on learning principles, learning materials are systematically arranged from simple to more complex materials [35], as the acquisition of new knowledge. In addition, the language used should be appropriate to the level of education [36] using communicative sentences and inviting students to think to grow their motivation and encourage their involvement in the learning process.

Still based on documentary study, the teaching materials made by the pre-service teachers have five characteristics, namely: (1) self-instructional, as shown in the supporting component, namely the formulation of learning objectives; (2) self-contained, meaning the teaching materials contain description of the materials in accordance with the purpose of learning and provide supporting information; (3) stand-alone, which means they contain the sub-topics discussed in the learning; (4) adaptive, that is using various learning resources, both from the local environment and information technology; and (5) user friendly, i.e. facilitating students to learn independently; containing examples, exercises, or assignments [12].

The ability of students to design teaching materials shows the actualization of: (1) academic competence in mastering the essence of learning in the field of geography; (2) critical-analytical thinking skills in identifying and selecting learning resources to be made resources of teaching materials; and (3) the ability to design effective learning by involving students. The teaching materials designed by the students are the proof of their ability to utilize learning resources into resources for teaching materials. This suggests that teaching materials can serve as guidelines for teachers to perform the role of a facilitator in learning activities [14].

The ability to design teaching materials is also the actualization of the role of teachers in facilitating student learning activities in order to attain optimal learning outcomes. The important thing to consider in designing teaching materials is the strategy/model/method of learning selected. The function of teaching materials in the learning process is to assist in creating effective and efficient learning. On the other hand, the function of teaching materials for students is to facilitate the learning experience in developing the potential of becoming an independent student [11]. The steps in developing geography learning materials are illustrated in the figure 1.

In general, the development of learning materials into teaching materials is a process consisting of three steps, namely: (1) analysis of the subject matter contained in the content standards, basic competence, and syllabus, translated into sub-topics oriented towards facilitating students to attain competence; (2) strategy of developing learning materials as the ability to identify learning resources and select them based on conformity to the competences and learning materials, and then utilizing them as a source of teaching materials to facilitate students to do learning activities and attain competence or learning outcomes; and (3) systematic design of sources of teaching materials, comprising of two components, namely core and supporting components.

4. Conclusions

Developing learning materials is one of the aspects of professional competency. The ability to develop geography learning materials is evidenced by documents of teaching materials produced at the Subject Specific Pedagogy workshop. Analysis of learning materials is based on content standards, basic competences, and syllabus. Learning materials are determined based on the goals or indicators of

competence attainment. The strategies to develop learning materials entail identification and selection of learning resources to be made resources for teaching materials and supporting information. Teaching materials are in the form of text that is designed systematically, consisting of core and supporting components as a guide for the learning process.

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Appendix

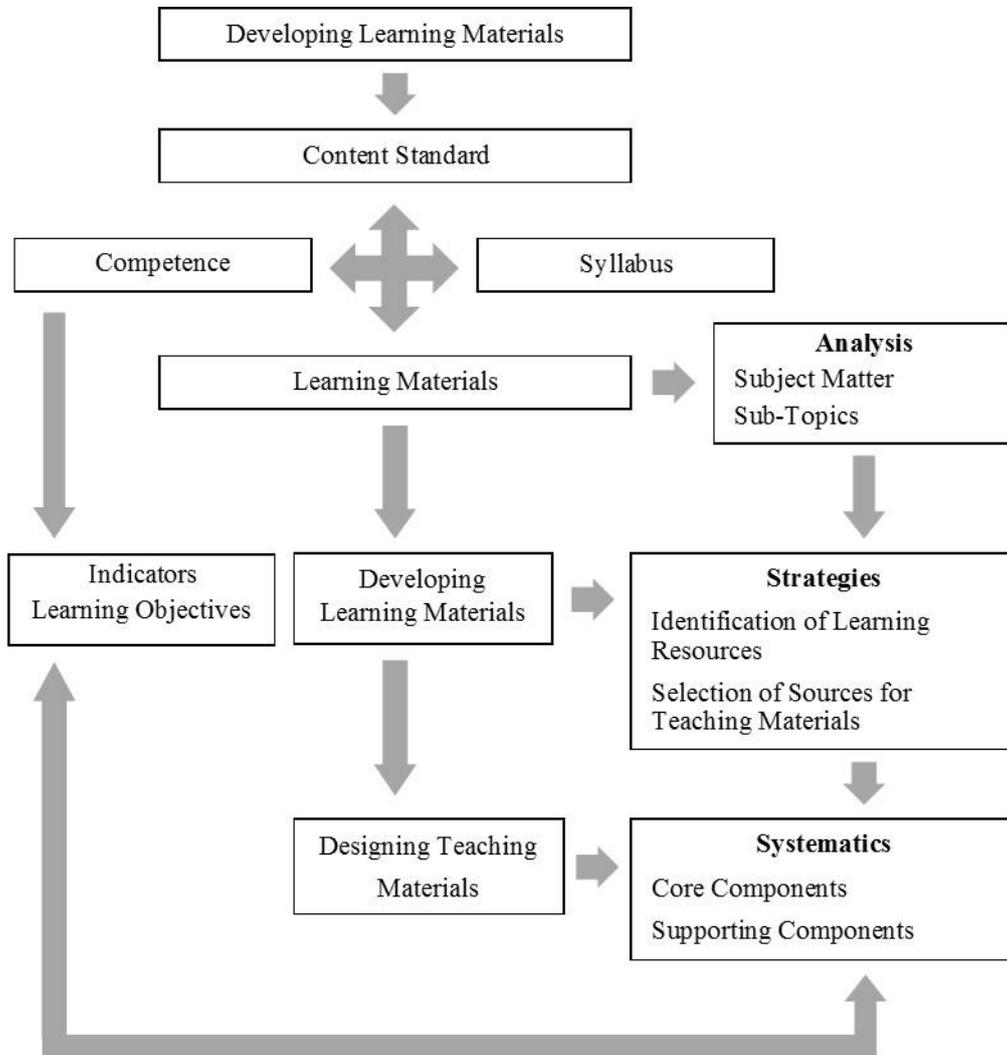


Figure 1. Steps in Developing Learning Materials