

# Perception of Engineering Education Students Using the Curriculum Design Module as a Guide in Developing a Syllabus and Learning Plan

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**Abstract**—This study aims to obtain information from engineering education students about the use of curriculum design modules as a guide to compiling a syllabus and lesson plans. This study used a qualitative method with research participants as engineering education students as vocational school teacher candidates at a state university in Bandung. The informants involved in this study were five students consisting of three men and two women who had already conducted teaching planning courses. The FGD (focus group discussion) interview method was used to obtain general information and individual interviews to obtain more specific data. The expected result is that the use of curriculum design modules can facilitate students in making a good syllabus and lesson plans. So that this research will have implications for the achievement of student competencies in planning the teaching and learning process according to the demands of the 2013 curriculum.

**Keywords**—curriculum design, engineering education, modules, lesson plans, syllabus

## I. INTRODUCTION

Currently, Indonesia uses the 2013 competency-based curriculum for classroom learning. The implementation of this curriculum has an impact on strengthening the learning process which requires students to be able to think critically and have a balanced ability in the aspects of knowledge, attitudes, and skills [1]. Engineering Education students as vocational school teacher candidates are required to be able to develop learning tools oriented towards the achievement of student competencies. These skills are taught in teaching planning courses. Teaching planning is a compulsory subject for every engineering education student (prospective teacher). The teaching materials provided include compiling a syllabus and a lesson plan. The syllabus is a plan that regulates learning activities and class management [2], as well as the assessment of learning outcomes from a subject [3]. The syllabus is part of the curriculum as the translation of Competency Standards and Basic Competencies into learning materials, learning activities, and competency achievement indicators for assessment of

learning outcomes. A well-written syllabus is able to communicate to students what is expected to be successful in a subject and what competencies must be mastered [4]. The syllabus is also seen as a "vehicle for expressing accountability and commitment" [5]. At least the general components in the syllabus include learning objectives, learning assignments, and reading references needed by students [6]. Meanwhile, the lesson plan is a plan that describes the procedures and organization of learning to achieve a basic competency set out in content standards and described in the syllabus. So it can be said that the lesson plan can be designed if the syllabus has been designed or the lesson plan is a derivative of the syllabus.

However, in reality there are still many engineering education students who have not been able to compile a syllabus and lesson plans. The author's experience as a lecturer in teaching planning subjects found that routine face-to-face teaching, structured assignments, and independent assignments were not able to facilitate students in compiling syllabus and lesson plans. This is a separate obstacle, so other efforts must be made in facilitating students so that they can be guided in carrying out the task of making learning devices.

The competency-based learning approach requires modules as teaching materials that students can use. Modules are teaching materials that are written systematically [7,8], operational and directed [9,10] with the aim that students can learn independently without or with teacher guidance. The use of modules causes students to be more active in the learning process (student center). The modules that are made are expected to be in accordance with the demands of the curriculum currently in use, namely the achievement of students' competencies which include knowledge, skills, and work attitudes. The three domains (cognitive, psychomotor, and affective) must always be contained in a module in order to become an ideal module and in accordance with the demands of the curriculum which requires a competency-based learning process [11].

The effect of using modules in the learning process in various subject areas has been carried out by several researchers. The development of scientific learning-based modules with problem-based learning models to improve students' ability to create in the accounting learning process has been proven effective in improving students' ability to create in the learning process [12]. The use of competency-based modules in refrigeration systems and installation subjects can improve student achievement, motivation and learning activeness in class [13]. In the development of PBL-based modules, the test results by experts and students stated that the module was feasible to use and there was an increase in learning outcomes in the affective and psychomotor domains with very good categories [14]. Based on this explanation, this study aims to obtain information from engineering education students about the use of curriculum design modules as a guide in compiling syllabus and lesson plans.

## II. METHODS

This study uses qualitative methods to explore the perceptions of engineering education students as vocational school teacher candidates in compiling syllabus and lesson plans using a curriculum design module. Participants in this study were students of mechanical engineering education at a state university in Bandung. This study involved five informants, three informants were male and the rest were female, who had already conducted teaching planning lectures. In-depth interviews were conducted to determine the obstacles experienced in compiling the syllabus and lesson plans. A list of interview questions was pre-prepared and structured. However, during implementation, interview questions can become unstructured if some information appears in practice that needs further study. Next, a Focus Group Discussion (FGD) was held three times to provide an explanation of the use of the learning tool module. First, the FGD discusses how to compile indicators of competence (IPK) in the cognitive, affective and psychomotor domains in the syllabus. In this session discussed about how to describe the IPK into learning materials and assessments. Second, the FGD discussed ways to make the syllabus content and lesson plans relevant. The data collected in this activity is the alignment of the contents of the syllabus and learning plans made by respondents. Finally, evaluate the syllabus documents and lesson plans according to

the module. The activity in this FGD was to explore respondents' experiences in making syllabus and lesson plans, based on the guidance of the learning device modules that had been given. These results show the weaknesses and deficiencies of the module content, so that revisions can be made to make it easier to use as a guideline for compiling a syllabus and lesson plans.

## III. RESULTS AND DISCUSSION

### A. Focus Group Discussion (FGD)

The FGD was conducted to obtain information on how to compile a syllabus and lesson plans by following the guidelines in the curriculum design module. A number of questions were asked to informants regarding the components of the syllabus which included basic competencies, indicators of competence, subject matter, learning, assessment, time allocation, and reference. The syllabus format for vocational education is shown in Table I.

The beginning of the FGD was started by asking questions to informants about their experience in filling in column 1, namely basic competencies (KD) in the syllabus matrix. Based on the module, the filling guide is done by writing pairs of KD 3... with KD 4... simultaneously. In general, all informants in this FGD stated that they had no difficulty filling in column 1. In this section they only copied KD 3 to KD 4 pairs from the curriculum document for each subject to be taught. Then, in the phase of filling in column 2, namely indicators of competence (IPK), informants began to have problems. The problem is in filling in the IPK for the psychomotor domain, especially in determining the criteria for work results and work time. The informants reasoned because they did not know the agreed standard of working time to do the work and after trying to search via the internet and other sources were not found. Furthermore, problems related to work results, informants complained about how to formulate work results in the psychomotor domain, especially in fields of work that do not produce physical products. It can be said that the difficulty they face is how to formulate an appropriate editorial for the work that students have done during practice.

TABLE I. SYLLABUS FORMAT FOR VOCATIONAL EDUCATION

Basic Competences	Indicators of Competence (IPK)	Subject Matter	Learning	Assessment	Time Allocation	Reference
1	2	3	4	5	6	7
KD 3.1..... KD 4.1.....	A. Cognition (Level....) B. Psychomotor (Level....) 1. K3 2. Preparation of work 3. Work Process 4. Work results 5. Working time C. Affective (Level....)	Pointers of the IPK	The learning method that will be used to meet the demands of KD 3.1  The learning model that will be used for KD 3.1 and KD 4.1 pairs  Practicum to meet the demands of KD 4.1	Types and forms of assessment for the cognitive domain  Observation sheet for practical process (psychomotor and affective domain)	How much time is needed for the subject matter theory (cognitive domain)  How much time is required for practical subject matter (psychomotor and affective domain)	References related to subject matter in KD 3.1 and KD 4.1
KD 3.2 .....						
KD 4.2.....						
Etc.....						

At the filling stage of column 3 to column 7 most of the informants stated that they did not experience significant problems. However, there are some informants who still have difficulty filling in column 6, namely time allocation and column 7 references. They stated that the time allocation should be filled with estimates, even though they actually knew that the determination of time allocation could be done by means of shadow teaching. Meanwhile, problems related to references will be pursued by searching for e-books from open source on the internet.

learning scenario was not well understood by the informants. Often times they only list commonly used methods such as oral presentations and discussions.

*B. Individual Interview*

Individual interviews were conducted with one informant who was selected based on the results of the evaluation in the FGD session. This informant seemed very enthusiastic and held a lot of discussion during the FGD. The questions asked by these informants are to complement the information that has been obtained from the FGD.

According to the informant, the preparation of the syllabus and lesson plans requires in-depth knowledge of the subject matter to be taught. At first she had difficulty understanding the material on the selected KD, moreover there was no reference book that could be used. Reference books for SMK lessons are limited in number and only a few are in Indonesian. Another opinion expressed by the informant was the difficulty in determining the time allocation for each different KD pairs. Because there is KD which can be finished in a short time, but on the other hand, there is KD which takes a long time. So a qualified experience is needed in carrying out learning. Moreover, this informant has a high school education background so that she does not really understand the vocational learning situation.

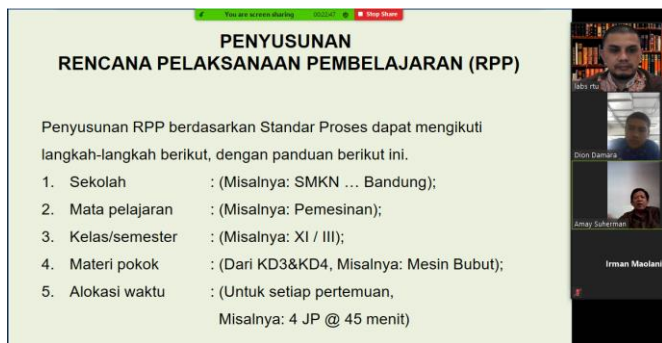


Fig. 1. FGD preparation of a lesson plan.

Next, at the stage of preparing the learning plan Figure 1, there were 15 questions asked of the informants regarding the components in the lesson plan. According to the informants, most of the questions can be filled easily because they only copy all the information needed from the curriculum and syllabus documents. The difficulty experienced is when determining the learning steps. At this stage they must determine the learning model, learning methods, and learning media that are in accordance with the subject matter being taught. The syntax formulation of the learning model and the

In connection with formulating indicators of competence in the resource's learning plan, the informant explained that he was confused in writing the right editorial according to the guidelines in the curriculum design module. Some criteria are not written on one indicator because they have previously been explained on other indicators. There needs to be a clear explanation in the module so that students can better understand the lesson plans. In the final stage of the interview,

the informants were asked about the use of the module as a guide in preparing learning tools. Her first hope is that the module editorial structure will be simpler and more communicative. Give concrete examples that are relevant to the SMK curriculum. Second, give bold sentences on important words that must be included in the syllabus and lesson plan. Finally, an explanation of the syntax of the learning model can be given an example for theoretical and practical material.

#### IV. CONCLUSION

The preparation of learning tools in the form of a syllabus and lesson plans is a skill that engineering education students must master as vocational teacher candidates. The presence of a curriculum design module really helps students in guiding the preparation of syllabus and lesson plans. However, the editorial composition of the module still needs to be improved, especially in the example section; it must be highlighted so that it can be understood well by students as module users.

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#### REFERENCES

- [1] A. Kusumam, M. Mukhidin, and B. Hasan, "Pengembangan Bahan Ajar Mata Pelajaran Dasar dan Pengukuran Listrik untuk Sekolah Menengah Kejuruan," *J. Pendidik. Teknol. dan Kejuruan*, vol. 23, no. 1, p. 28, 2016.
- [2] J. Parkes and M.B. Harris, "The Purposes of a Syllabus," *Coll. Teach.*, vol. 50, no. 2, pp. 55–61, 2002.
- [3] R. Cullen and M. Harris, "Assessing learner-centredness through course syllabi," *Assess. Eval. High. Educ.*, vol. 34, no. 1, pp. 115–125, 2009.
- [4] C. Stanny, M. Gonzalez, and B. McGowan, "Assessing the culture of teaching and learning through a syllabus review," *Assess. Eval. High. Educ.*, vol. 40, no. 7, pp. 898–913, 2015.
- [5] D.V. Habanek, "An Examination Of The Integrity Of The Syllabus," *Coll. Teach.*, vol. 53, no. 2, pp. 62–64, 2005.
- [6] P.C. Gorski, "What we're teaching teachers: An analysis of multicultural teacher education coursework syllabi," *Teach. Teach. Educ.*, vol. 25, no. 2, pp. 309–318, 2009.
- [7] P. Thomas and A. Nurkhin, "the Development of Learning Sets and Research Methodology Module Using Problem Based Learning for Accounting Education Students," *J. Account. Bus. Educ.*, vol. 1, no. 1, p. 77, 2016.
- [8] D.T. Wahyuningsy and I.K. Suastika, "Developing of Numbers Learning Module for Primary School Students by Contextual Teaching and Learning Approach," no. September, pp. 33–36, 2016.
- [9] E.E. Goff et al., "Efficacy of a meiosis learning module developed for the virtual cell animation collection," *CBE Life Sci. Educ.*, vol. 16, no. 1, pp. 1–12, 2017.
- [10] R.A.H. Cahyadi, "Pengembangan Bahan Ajar Berbasis Addie Model," *Halaqa Islam. Educ. J.*, vol. 3, no. 1, p. 35, 2019.
- [11] M.W. Setiyadi, "Pengembangan Modul Pembelajaran Biologi Berbasis Pendekatan Saintifik Untuk Meningkatkan Hasil Belajar Siswa," *J. Educ. Sci. Technol.*, vol. 3, no. 2, p. 102, 2017.
- [12] A. Susilo, Siswandari, and Bandi, "Pengembangan modul berbasis pembelajaran saintifik untuk peningkatan kemampuan mencipta siswa dalam proses pembelajaran akuntansi siswa kelas XII SMAN 1 Slogohimo 2014," *J. Pendidik. Ilmu Sos.*, vol. 26, no. 1, pp. 50–56, 2016.
- [13] A. Suherman, A. Wiyono, Y. Yayat, R.M.H.K. Negara, and E.T. Berman, "Enhancing student learning achievement using competency-based modules on basic competencies examining the characteristics of refrigerants and lubricating oils," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 830, no. 4, 2020.
- [14] A. Husniati, Suciati, and Maridi, "Pengembangan Modul Berbasis Problem Based Learning ( PBL ) Disertai Diagram Pohon pada Materi Fotosintesis Kelas VIII SMP Negeri 1 Sawoo," *J. Inkuiri*, vol. 5, no. 2, pp. 30–39, 2016.