

DEVELOPMENT OF LEARNING DEVICES IN AGRICULTURAL CHEMISTRY COURSES BASED ON KJNI CURRICULUM

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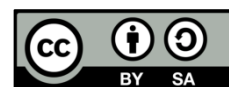
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ABSTRACT

Learning tools are one of the important factors influencing the success of learning, especially in higher education. By improving the quality of learning tools, it can make it easier for students to understand the materials including agricultural chemistry learning materials. This study aims to develop learning tools in the form of Semester Learning Plans (RPS) and Student Task Designs (RTM) according to the Indonesian National Qualification Framework (KJNI) curriculum. This development was carried out in the agricultural chemistry course in the Department of Agroecotechnology, Malikussaleh University (Unimal). This study uses a research design for the development of a 4-D model by Thiagarajan, but in this study it only reaches 3 stages, namely the definition stage, the design stage, and the development stage. The validators involved in this research are development experts and material experts. The results of the validation of learning tools obtained that the average value of the two devices was 3.62 (very feasible criteria). This means learning tools are made in accordance with Indonesia's national qualification framework.

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1. INTRODUCTION

The Indonesian government has made great efforts to improve education. One of the things the government is doing is reforming the school curriculum and university curriculum. (Solikhah, 2015). Curriculum change is a natural process that occurs as a response to various developments in science and technology (IPTEK), local needs, world developments, and new policies from the government (Kemendikbud, 2014). The curriculum currently being developed in several Indonesian universities is the Indonesian National Qualifications Framework (KJNI). The IQF is a competency measurement scale that can aggregate, equalize and integrate the domains of vocational education and training according to the hierarchy of positions in different domains.

Based on Presidential Decree No. 8 of 2012 it is stated that the implementation of the KKNI considers educational goals in the form of characteristics of knowledge and skills, work skills, attitudes towards work and ways of living in society as the minimum requirements that must be achieved by students in completing a study program. Conceptually, the level of qualifications in the KKNI is structured by four parameters, namely: (1) work skills, (2) scope of knowledge (knowledge), (3) method and level of ability to apply knowledge, and (4) managerial ability. Internalization and accumulation of the four parameters that must be achieved through a structured educational process or through work experience as learning outcomes. Determination of learning outcomes (learning outcomes) in tertiary institutions contains 4 elements of the IQF description, namely aspects of general ability, competence in the field of work, in the field of knowledge, and managerial competence. (Perpres RI No. 8, 2012).

Malikussaleh University (Unimal) is one of the tertiary institutions which has not yet implemented an KKNI-based curriculum. The KKNI curriculum has not been implemented in all departments including the Agroecotechnology department. Based on the results of observations and interviews with one of the lecturers at the Faculty of Agriculture at Unimal, it is known that several lecturers are still studying and starting to develop learning tools based on the IQF curriculum for each subject being taught, one of the subjects being agricultural chemistry. According to Prausnitz, the learning process also needs to be changed or developed, this is influenced by changes in the world, this is stimulated by developments such as technology, politics, social institutions, namely by changes in the way people think, ethics and beliefs by attitudes and expectations (Prausnitz, 2011).

This study aims to develop learning tools in the form of Semester Learning Plans (RPS) and Student Task Designs (RTM) in basic chemistry courses in the Agroecotechnology department. The legal basis for preparing this designed lesson plan refers to Permenristekdikti Number 44 of 2015. Article 12 states that semester learning plans are determined and developed by lecturers independently or together in a group of expertise in a field of science and/or technology in the study program. The standard learning tools that have been compiled must be related to the IQF perspective, each study program is required to clarify the expected graduate profile through study tracking activities, feasibility studies and needs analysis in the community (Yudha, 2021). The graduate profile reflects the minimum abilities that students must master after graduation which refers to four aspects of needs (1) attitude, (2) work ability, (3) knowledge, and (4) managerial and responsibility. These four abilities are then translated into learning outcomes in each subject in the study program. So that later, all learning plans or Semester Implementation Plans (RPS) must be based on learning outcomes that are in accordance with the needs of graduate profiles (Effiyanti, 2018). These four abilities are then translated into learning outcomes in each subject in the study program. So that later, all learning plans or Semester Implementation Plans (RPS) must be based on learning outcomes that are in accordance with the needs of graduate profiles (Effiyanti, 2018). These four abilities are then translated into learning outcomes in each subject in the study program. So that later, all learning plans or Semester Implementation Plans (RPS) must be based on learning outcomes that are in accordance with the needs of graduate profiles (Effiyanti, 2018).

2. METHOD

This type of research is research and development (research and development). This development research refers to the 4-D model (four-D model) which consists of four stages of define, design, develop, and disseminate (Thiagarajan, 1974). This research only reached the development stage. Although only up to the development stage, this learning tool already includes the principles of development research.

According to Mulyatiningsih (2016), the essence of development research is validation and revision of the learning tools developed. The types of data obtained in the analysis of this book are qualitative and quantitative data. Qualitative data are comments, suggestions or criticisms from the validator. While quantitative data in the form of numbers obtained based on the validation sheet

using a Likert scale (range 1 - 4). Where the criteria are 4 = very good, 3 = good, 2 = not good, 1 = not good.

The data collection instrument used in this study was the learning device validation sheet. The data analysis technique used to analyze the RPS validation data is the average calculation technique. According to Arikunto (2006), the range of validation criteria for complete calculation results can be observed in Table 1.

Table 1. The validation criteria for the analysis of the average value

Average	Category
3.26 – 4.00	Valid
2.51 – 3.25	Valid Enough
1.76 – 2.50	Invalid
1.00 - 1.75	Invalid

(Source: Arikunto, 2013)

3. RESULT AND DISCUSSION

The results of this development research are products in the form of RPS and RTM which are compiled based on the KKNi curriculum in the agricultural chemistry course in the Unimal Agroecotechnology Department. The stages of development carried out in this study, namely (1) the definition stage, at this stage observations were made regarding the agricultural chemistry course. Observations made are observations regarding the devices used by the supporting lecturers. The results obtained are that the tools used are incomplete and still refer to the old curriculum. Existing learning tools are lecture contracts and GBRP (Outline of Lesson Plans). While complete learning tools include lecture contracts, course syllabus, Semester Learning Plans (RPS), Learning Process Plans (RPP), Student Task Plans (RTM).

The second stage is the design stage, at this stage learning devices are started to be made including the Semester Learning Plan and Student Assignments Design. The semester learning plan made includes (a) Name of study program, name and course code, semester, credits, name of supporting lecturer; (b) Graduate learning outcomes assigned to courses; (c) The final capability planned at each learning stage to meet the learning outcomes of graduates; (d) Study materials related to the abilities to be achieved; (e) Learning activities; (f) The time provided to achieve abilities at each stage of learning; (g) Student learning experience which is manifested in the description of tasks that must be done by students for one semester; (h) Criteria, indicators, and assessment weights; and (i) List of references used. The draft student assignment (RTM) made includes several types of assignments consisting of Routine Assignments (TR), Critical Book Review (CBR), Journal Review (JR), Miniresearch (MR), Idea Engineering (RI), and Projects (PR). The assignments given are in accordance with the material in the basic chemistry course. Each assignment has its own assessment standard.

The last stage is the development stage. This stage aims to produce learning tools (RPS and RTM) that are valid/feasible for used. At this stage the results of the design of the basic chemistry material learning device are submitted to the validator. The validators who assess are development experts and material experts. Validation results for RPS can be seen in Table 2.

Table 2. Semester Learning Plan Validation Results

No	Aspects studied	Validator Value		Amount Score	Average score-flat
		I	II		
1	The RPS format is in accordance with the IQF, the components consist of: 1. RPS ID 2. Learning achievement 3. Short course description 4. Study material 5. Course matrix 6. Learning resources/tools/materials	4	3	7	3.5
2	The complete RPS identity contains the name of the course, course code, course group, subject weight and course lecturer.	4	4	8	4
3	CPL learning outcomes in the IQF are mainly related to elements of special skills (work ability) and mastery of knowledge, while those that include attitudes and general skills can refer to formula that has been set in SN-Dikti	4	4	8	4
4	Short description of the course short description about precise and systematic courses	3	4	7	3.5
5	Appropriate and systematic study material	3	3	6	3
6	Learning activities in accordance with learning outcomes	3	4	7	3.5
7	The main points and sub-topics are clear and systematic	4	3	7	3.5
8	Learning indicators describe the details learning outcomes are clear and precise	4	4	8	4
9	The learning model is in accordance with the material and achievement of learning indicators	3	4	7	3.5
10	Appropriate time allocation	4	4	8	4
11	Assessment of types of bills and forms of instruments clear assessment	4	4	8	4
12	Teaching tools and materials are appropriate to achieve indicator	4	3	7	3.5
Average rating score				3.67	
Criteria				Very Worth it	

Based on the results of the validation analysis of the feasibility of the Semester Learning Plan, it obtained an average score of 3.67 in the very feasible category. This is because at the development stage of the RPS, several improvements have been made based on the suggestions and criticisms given by the validator. The next learning tool is in the form of Student Task Plans (RTM). The validation results for RPS can be seen in Table 3.

Table 3. Student Assignment Design Validation Results

No.	Aspects studied	Mark Validators		Amount Score	Score flat-flat
		I	II		
1	RTM consists of the types of tasks that are compatible with Achievements learning KKNi load knowledge, attitudes and skills	4	4	8	4
2	Material selected for each type of task appropriate and precise	4	4	8	4
3	The material on the RTM is in accordance with the achievements learning	3	4	7	3.5
4	The procedure for working on each type of task in RTM is clear and complete	3	3	6	3
5	RTM presentation is systematic and interesting	4	3	7	3.5
6	Assessment of tasks on RTM has been appropriate and complete.	3	4	7	3.5
Average rating score				3.58	
Criteria				Very Worth it	

Validator one suggested that the criteria for assessing the accuracy of the concept were good, for some of the main material regarding plants, organic farming, pesticide chemistry, basic chemistry in agrochemicals it was included in the correctness of the concept and for the Student Assignment Design (RTM) indicators it didn't have to be the same, depending task description. Validator two stated that the student assignment design was in accordance with the Indonesian national qualifications framework (Yudha, 2023). In the design of KKNi student assignments it is best to consist of different types of assignments, this is in order to improve the quality of students in learning achievement in terms of knowledge, attitudes and skills. In addition, RTM has also been equipped with an understanding of each type of task, work process, report systematics and assessment indicators that are adjusted to the character of the type of task.

4. CONCLUSION

Based on the results of data analysis and discussion of the process and results of developing learning tools based on the Indonesian National Qualifications Framework, the following conclusions can be drawn:

- This research has succeeded in developing learning tools in the form of Semester Learning Plans (RPS) and Student Assignment Designs (RTM) based on the KKNi curriculum in the agricultural chemistry course in the Unimal Agroecotechnology Department.
- The learning tools developed in this study have met the validity criteria obtained through the opinion of the validator. With a description of the semester learning plans and student assignment designs including very feasible criteria.

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