

Analysis of Chemical Teaching Materials in Physical Education Study Program Darma Agung University

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ABSTRACT

This study aims to determine general chemistry teaching materials, general chemistry practicum at the Darma Agung university physics education study program. The population in this study as well as samples are education students of 2013 Darma Agung University physics education program, amounting to 30 people and 1 lecturer who oversees general chemistry/general chemical practice. The instruments used were questionnaires, namely 10 student assessment questionnaire items for lecturers and 10 questionnaire items for interviewing lecturers who administered general chemistry/general chemistry lab subjects and 10 questionnaires to observe teaching materials. The results of the study that the lecturer gave an agreement/contract of learning and teaching materials to be studied but did not provide pre-test and post-test to see the students' knowledge of teaching materials. Lecturers tend not to develop teaching materials in accordance with competency standards and basic competencies. Based on the results of interviews from lecturers who teach general chemistry practicum courses, teaching materials for practical guidance do not yet exist. Practicum implementation is only 4 meetings due to the limitations of lab tools and materials. Books that support general courses/general chemistry labs are not available in the library.

KEYWORDS: Teaching materials, Modules, Learning

1. INTRODUCTION

Higher education organizes higher education and research and community service. Higher education produces educated human beings that is preparing students to become members of the community who have academic and professional abilities that can apply, develop or enrich the repertoire of science, technology, art, develop and disseminate science and technology and seek its use to improve people's lives and enrich national culture [1]. In formulating the objectives of the course called general instructional objectives, lecturers need to identify the abilities expected to be achieved by students at the end of the semester. This goal is explained to students and their relevance to the needs of various work worlds that may be the work of students later.

The ability of lecturers in formulating and explaining the overall instructional objectives and explaining them convincingly to students is the first strategic point of the application of the principle of relevance in education. In selecting and presenting lectures, in addition to gathering or compiling materials that are relevant to instructional objectives, lecturers also need to develop examples and exercises in applying the concepts, principles, and procedures contained in these materials into various work worlds that might be the work of students after graduate. The examples and exercises will be more stable if presented by lecturers or other people who have work experience in the field. The provision of examples and exercises is the second strategic point of application of the principle of relevance. A good lecture process must be complemented by other things, namely an assessment of the process and results of the lecture. The assessment of the lecture process besides aiming to improve the lecture, also aims to increase student motivation in the course. Students who are involved in assessing the lecture process will feel given the opportunity to participate in thinking about the development of lectures. This will add to the attention and interest of students towards courses and fields of work that require the application of the knowledge learned [2].

The prevailing education system also requires that a lecturer always has the principle to be able to develop teaching materials by utilizing a variety of available resources to help students achieve the set competencies. Teaching materials are all materials, both information, tools, and texts that display a complete figure of competencies that will be mastered by students and used in the learning process with the purpose of planning and studying the implementation of learning [3]. In this case the development of teaching materials is in line with the demands to develop curriculum and syllabus. Besides teaching materials, lecture process, facilities and infrastructure, lecturer requirements also influence the achievement of competencies. Therefore, to analyze

teaching materials or instructional materials and components that influence the learning process, a study is conducted to examine how the chemistry teaching material in higher education is conducted.

Teaching materials are very useful to provide experience and sources of learning directly and concretely to students because they can provide illustrations of something that is difficult to hold, seen directly [4]. On the basis of the above, the research conducted by the researcher was "Analysis of Chemistry Teaching Materials at the Darma Agung Physics Education Study Program".

2.METHODOLOGY

This research is a descriptive research [5,6] that is knowing basic chemistry teaching materials, basic chemistry practicum in the study program of Physics Education at Darma Agung University. To find out the use of basic chemistry teaching materials used 10 questionnaire items for lecturers, 10 questionnaire items to interview general chemistry lecturers and observation sheet learning aspect.

Table 1. Student Assesments on Dons

No.	Statement	Yes	No
1	Lecturers provide learning agreements / contracts and teaching materials to be learned		
2	The lecturer opens the lesson and provides an opportunity for students to study the teaching material for a moment		
3	Lecturers develop chemistry teaching material in your study program in accordance with SK and KD		
4	The teaching materials delivered by lecturers in the chemistry learning process provide clarity		
5	Facilities and infrastructure used in accordance with the SK and KD to be achieved		
6	The facilities and infrastructure used are adequate (complete) in accordance with the teaching material		
7	Lecturers who teach this subject are in accordance with their fields of expertise		
8	Qualifications of lecturers who teach teaching materials at the level of S2		
9	The lecturer gave a pre-test and post-test to see the knowledge students had about teaching materials		
10	Lecturers submit the results of the pre-test and post-test to students as PBM feedback		

Table 2. Interview button For Lecturers

No.	Statement	Yes	No
1	Did you convey the learning agreement/ contract and teaching materials that will be studied at the beginning of the lecture?		
2	Did you open the lesson and provide an opportunity for students to study the teaching material for a moment?		
3	Did you use chemical teaching materials in the study program in accordance with SK and KD?		
4	Does the teaching that you convey in the chemistry learning process provide clarity?		
5	Whether the facilities and facilities that you use will be in accordance with SK and KD?		
6	Are the facilities and infrastructure you use adequate (complete) in accordance with the teaching material?		
7	Is this course in accordance with the expertise you have?		
8	Have you had S2 level qualifications?		
9	Do you give pre-test and post-test to see the knowledge students have about teaching materials?		
10	Did you submit the results of the pre-test and post-test to students as feedback on the teaching and learning process?		

Table 3. Observation Sheet Learning Aspec

No.	Statement	Yes	No
1	Are learning objectives in accordance with the curriculum?		
2	Are learning instructions clear enough?		
3	Is the material sequence right?		
4	Is the material description / explanation clear enough?		
5	Is the material depth enough?		
6	Is giving assignments in accordance with the material?		
7	Is the material description / explanation clear enoug		
8	Are the test questions in accordance with the learning objectives?		
9	Is the explanation of the term clear enough?		
10	Is the use of language easy to understand		

3.RESULTS AND DISCUSSION

The syllabus is used to refer to a curriculum development product in the form of further elaboration of the SK and KD to be achieved, and the subject matter and material description that students need to learn in order to achieve SK and KD. Syllabus is a learning plan for a particular subject and group/theme that includes SK, KD, learning material, learning activities, indicators of achievement of competencies, assessment, time allocation, and learning resources.

The syllabus is useful as a guideline in developing further learning, such as making learning plans, managing learning activities, and developing assessment systems. Syllabus is the main source in the preparation of learning plans, both learning plans for one SK and one KD. The syllabus is also useful as a guide for planning management of learning activities, such as classical learning activities, small groups, or individual learning. Similarly, the syllabus is very useful for developing a scoring system. In the implementation of competency-based learning the scoring system always refers to SK, KD, and indicators contained in the syllabus [7].

Darma Agung University physics education study program uses a competency-based curriculum (KBK) with a total of 36 courses. Of the 36 subjects related to chemistry consists of two courses namely general chemistry and general chemistry lab. General chemistry (3 credits), the scope of the material are: atomic structure and chemical bonds, concentration and colligative properties, acidity (pH), electrolyte solutions, redox and electrochemical reactions, chemical kinetics, energetics. The lecture process of this great Darma University physics education uses a face-to-face system. The learning process itself is done by lecturing and discussion methods. Students are invited to discuss understanding various situations while learning to find solutions to each problem.

Based on the results of the student assessment questionnaire on the lecturer, the lecturer gave an agreement / learning contract and teaching materials to be studied (93.32%) but did not give pre-test and post-test to students. Lecturers who teach general chemistry courses and general chemistry practicums are not in accordance with their fields of expertise (100%). The same thing was also stated by the lecturer teaching general chemistry/general chemistry practicum subjects when interviewed that the lecturer had a background in physics education. The lecturer opens the lesson and does not provide an opportunity for students to study the teaching material for a moment (100%), but directly teach with the lecture method.

Textbooks that support general chemistry/practicum courses are not available in the library. Wifi is one way to help lecturers and students to get teaching materials that are not yet available. Books that are not available in the library can be completed if the lecturer is able to compile teaching materials based on the subject matter taught.

Based on the interview results, the lecturer did not have teaching materials [8]. With the teaching materials students are increasingly enthusiastic in learning [9]. Infocus that functions as a medium in the teaching and learning process is incomplete. Wifi that is not yet available causes lecturers / students and not to be able to access the internet for free [10].

Basic chemistry practicum (1SKS) includes material: introduction of basic laboratory tools and techniques, physical purification and separation of substances, polarity and conductivity of solutions, preparation and dilution of solutions, pH scale and use of indicators, acid and base titrations, electrolysis cells, factor factors which affects the rate of reaction, determination of reaction heat. Based on the results of interviews with general chemistry practicum lecturers who lacked tools and materials used in chemical laboratories. The laboratory owned by a

physics education study program is incomplete. The unavailability of practical tools and materials that support practical activities is due to the high cost of these tools and materials [11]. Ingredients / chemicals not available can use natural ingredients [12] [13].

In formulating the objectives of the course called general instructional objectives, lecturers need to identify the abilities expected to be achieved by students at the end of the semester. This goal is explained to students and their relevance to the needs of various work worlds that may be the work of students later.

The ability of lecturers in formulating and explaining the overall instructional objectives and explaining them convincingly to students is the first strategic point of the application of the principle of relevance in education. In selecting and presenting lectures in addition to compiling or compiling materials relevant to instructional objectives, lecturers also need to develop examples and exercises in applying the concepts, principles, and procedures contained in these materials into a variety of work worlds that might be the work of students after graduate later.

In selecting and presenting lectures, in addition to gathering or compiling materials that are relevant to instructional objectives, lecturers also need to develop examples and exercises in applying the concepts, principles, and procedures contained in these materials into various work worlds that might be the work of students after graduate.

The learning objectives and material descriptions are clearly explained by the lecturer, while the material explanation is not clear. The lecturer also provided feedback in motivating students to learn. The questions in the test are in accordance with the learning objectives. The examples and exercises will be more stable if presented by lecturers or other people who have work experience in the field. The provision of examples and exercises is the second strategic point of application of the principle of relevance. In the learning process the use of language is clear.

3.CONCLUSION

Based on the results of the study, lecturers who teach general chemistry subjects are not from a chemical background but physics education causes the lecturers to be less than teaching. General chemistry practicum is held only 4 times due to incomplete equipment and materials in the laboratory so practicum is carried out using natural materials. Wifi and an incomplete library especially for general chemistry course books and general chemistry preactics cause students not to study optimally.

4.SUGGESTION

Based on the results of the analysis, the authors suggest:

- 1.It is better if the lecturer who teaches basic chemistry is his educational background from the Masters in Chemistry and Chemistry.
2. The university provides tools and materials for basic Chemistry practicum in order to improve learning objectives.
- 3.Increase the number of books in the library, especially basic chemistry courses.

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