

DEVELOPING INSTRUCTIONAL MATERIAL FOR BIOLOGY EDUCATION DEPARTMENT STUDENTS OF IAIN RADEN INTAN LAMPUNG

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ABSTRACT: The purpose of this study is to provide the students and the lecturers with an appropriate instructional material that is in-line with the syllabus and fit the students' needs. The research was conducted using the procedures of research and development (R&D) that consist of need assessment, planning, material development, evaluation and revision, field testing, and the last is final product revision. The data were collected through interview, questionnaire, observation, field notes, and expert validation. The result of the research is that the product of the research is developed into ten units. Each unit was developed to contain three main sections, namely, reading section, grammar section, and speaking section. The instructional material also contains various exercises both written and spoken so that the students could be actively involved in the teaching and learning activities. The media included in the instructional material was selected to help the students in learning by providing media in multimedia format in the form of videos, songs, and dialogues and monologues. Students also could access websites that are suggested in the instructional material that contain online English games and additional materials.

Keywords: instructional material, research and development.

Brown (1992:217) states that, for almost six decades now research and practice in English language teaching has identified the four skills as listening, speaking, reading, and writing-as of paramount importance. In order to acquire the skills that should be mastered by the students, there is one important factor that must be fulfilled, that is the existence of an appropriate instructional material. Instructional materials are kind of tools or equipments that can effectively help the instructor in theory teaching classroom or in practical assessment. Allwright (1990:14) states that materials should teach students to learn that they should be resource books for ideas and activities for instruction in learning, and that they

should give teachers rationales for what they do. From the theory above, it is clear that the role of material is important in the teaching and learning activity.

The material should be carefully chosen to achieve effectiveness in teaching and learning process. There are many considerations in choosing the right instructional material. Tomlinson (2008: 17) states for what kinds of learners are these books, what are the needs and wants of the teachers and learners who use these books, and are these books meeting the target users needs and wants. Those questions reflect what should present in a book or instructional material. Aside from the content of the material, the students must also be considered in choosing the instructional material, who the students are, what are their major, what kinds of material that they really need, and whether the material meets the objective of the study. The material should be suitable with the needs of the students. The content of the material should be specific enough to ease the students in understanding it. Specific means the material should be related to each of the students' field of disciplines. For example, the content of instructional material for the students of business major should be related to business, the reading passages, the tasks, and the activities should be close enough to their field of study.

The students also become an important factor to be considered. Teaching English in tertiary level is not a trivial matter; there are challenges that must be overcome. Nicholls (2002: 1) states that the key elements to achieve success are for all academics to demonstrate knowledge of their subject and its pedagogy, and practice that is underpinned by a range of professional values. Related to the English language teaching, the theory above suggests that not only the content of the material that is matter, but also the professionalism values also important. It must be taken into consideration that university level of education consists of diverse majors that have its own knowledge discipline.

Some problems are found during the development stages. Based on the observation, the researcher found that there is no suitable book or instructional material that fit the requirement of the syllabus and fit the specific needs of the students. The specific needs here can be defined as the needs for the materials to be fit with the students' range of professional values. The second problem found

during the preliminary was the syllabus. It was found that the content of the syllabus and the course objective was irrelevant. The course objective stated that the students were required to develop their basic English knowledge which covers the mastery of speaking skill, writing skill, reading skill, and listening skill. The problem was that the content of the syllabus only contain grammar materials without any chance for the students to develop the required skills. It can be concluded that the objective of the course was not supported by the content of the syllabus.

Based on the background of the study and the problems found, the purpose of this research is to develop an appropriate instructional material to be used in teaching and learning activity in the Biology Education Department Raden Intan Lampung. The instructional material was developed to meet the students' and lecturer's needs and expectation based on the data of need assessment collected in the first stage of development. The instructional material is also intended to match the course objectives of English subject of Biology Education Department. The course objectives of English as stated in the syllabus are for the students to acquire English basic skills through grammatical theory and practice.

METHOD

The model of the study is an adaptation from the procedures proposed by Borg and Gall (1983, 775). The processes of development implemented in this study are need assessment, planning, material development, evaluation and revision, field testing, and product revision. To be precise the procedures of development are describe as follow.

Need Assessment

The first stage in developing the instructional material was need assessment. In this stage the researcher explored the subjects' needs. The purpose of conducting need assessment is finding as much as information about the needs of the students and lecturer and use that information to develop the instructional material. The instruments used in conducting need assessment were interview and questionnaire. The interview was asked to an English lecturer who teaches in Biology Education Department. The interview was intended to identify the material that was used by the lecturers in teaching; furthermore, the interview was also used to find out the lecturer's idea about needs of instructional

material, the material that should be included in the book; the activities, and its appropriateness with the objective of the syllabus. The questionnaire was distributed to the students. The questionnaire was intended to investigate the students' present English ability and their preference of the topic of the book, and the content of the books.

Planning

Planning was the second stage of the instructional material development. In this stage, the researcher decided what steps would be taken based on result of the analysis of the data taken from need assessment. In this step also the researcher selected the appropriate content of the instructional material.

Material Development

The materials of the instructional material were developed in this stage. The researcher took the material from various sources that later would be selected based on the process of adapting and adopting.

Evaluation and Revision

The next stage of the material development was evaluation. The developed product was specifically evaluated through expert validation. The instrument used in this stage was expert validation checklist. In this stage the researcher proposed the draft of the developed material to the experts to be evaluated. The expert concerned with the appropriateness of the content of the material with the syllabus, the students exercises, and the grammatical and vocabulary aspects.

Field Testing

The instructional material was tested in the field to see the practical implementation in the process of teaching and learning. The instructional material was field-tested to one class of the second semester of Biology Education Department. In collecting the data of field testing, the researcher employed observation, and interview.

Final Product Revision

In this stage the product was revised based on the data of the field testing. The result of observation and the students' and lecturer's responses on the interview after the try-out were evaluated to decide whether the revision is needed and what aspects need to be revised.

Finding and Discussion

The Result of Need Assessment

The first data in the need assessment stage was collected through questionnaire for the students and interview for the lecturer. The data of the questionnaire was divided into two categories namely students' present English skill and students' expectation toward the developed instructional material. Through the data of the questionnaire, it could be determined that the students' present English skill is at the beginner level.

The next discussion of the questionnaire deals with the future skills that the students need to master and students' expectation toward the content of the developed instructional material. The discussion regarding this matter covers the students' expectation of the developed instructional material that covers the kind of materials, exercises and the media. The data shown that 32% or 39 students of the students need to focus on reading skill and the students that need to focus on speaking skill are 38% or 46 students. The data indicates that the students prefer to have reading and speaking skill to be the skills that should be focused on the developed instructional material. The data regarding the students' preference toward the developed instructional material that covers the kind of materials, exercises and the media showed that 79% or 97 students want the materials are related to their major, 65% or 80 students expect the exercises to be constructed into sentences that easy to be understood, and all of the students agree that the media included in the instructional material in the form of multimedia.

The second data of the need assessment was collected through interview for lecturer to investigate the lecturer's view of the current instructional material and her expectation toward the developed instructional material. The data collected showed that there was no suitable book that was used in the teaching and learning activity. The books that the lecturer used were not in line with the content of the syllabus as well as the course objectives. The books that were used in teaching and learning activity also do not match the students' level of difficulty and do not have media to help the teaching and learning activity. The lecturer expects the developed instructional material to contain related English lesson with Biology. The lecturer also expected that the book to be focused more in the reading skill. It also should contain broad variety of exercises and accompanied with multimedia technology as the media.

The Development of the Instructional Material

The content of the instructional material was developed based on the data gained in the need analysis. The result of the questionnaire for the students and interview for the lecturer was used as the basis of the development stage. Based on the data gained, the content of the instructional material was developed into three main sections, namely reading section, grammar section, and speaking section.

The reading section of the instructional material was specially designed to meet the students' need to focus more on the reading skill. The reading section contains reading materials for the students that was taken from variety of discussions in biology. The materials were taken by analyzing the syllabus of Biology courses, namely Physiology, Anatomy, Zoology, Botany, and Micro Biology. All of the Biology courses mentioned before have been studied by the students in the previous semester. This action was taken by considering that by including the materials that have been learnt by the students before, it could be helpful for students since they are already familiar with the discussion and help them activating their background knowledge. The differences are, in the developed instructional material, the materials are discussed in English and focused on the development of students' reading skills.

The development of speaking section was done by analyzing the data of need assessment. The speaking materials were selected so that it matches the discussion of grammar section. For example the first material of the speaking section discussed the self-introduction which is a lot of use of to be that discussed in the same unit. The speaking activities begins with simple language functions namely introduction and then developed to the use of speaking expressions.

The instructional material provides a special section that covers the content of the syllabus in each unit of the developed instructional material. The section is called Grammar Section. The content of the grammar section are designed to be in line with the content of the syllabus. The grammar section also presented variety of exercises as well as variety of media to assist the students in learning. The grammar section was presented by first explaining the content of the lessons, and then followed by presenting examples and exercises.

The exercises of the instructional material were developed based on the data of need analysis. The data showed that the exercises in the developed instructional material should be varied and constructed by not only written exercises but also oral exercises. The exercises could be useful for the lecturer to give practical assessment to the students in the teaching and learning activity. All types of exercises in the instructional material have been analyzed and selected so that it is relevant to each section of the instructional material. Based on the data of the need analysis, the media in the instructional material are in the form of multimedia. The media consist of offline and online media. The on-line media are online language games and websites. Students can learn independently by accessing these games and websites outside of the class. The offline media are videos animation movies, songs, pictures and listening materials.

The Result of Expert Validation

The developed instructional material was consulted to the experts as the next stage of the development. This stage was conducted to find out the weaknesses of the developed instructional material through the feedback of the experts. The experts were chosen based on their expertise in each discipline related to the developed instructional material; they are the expert of Biology Education, and two experts of TEFL.

There were some good points of the instructional material found based on the expert validation checklist. The first was the content of the instructional material were in-line with the syllabus since materials presented in the instructional material covered all the content of the syllabus. The materials of the instructional material materials also in-line with the course objective which is enabling the students to acquire basic English skills through grammatical theory and practice. The materials presented in the instructional material also could work well with the methodologies in ELT. In the process of teaching and learning using the developed instructional material it is possible to apply many techniques of teaching.

The next good point of the instructional material was the overall content of the instructional material. The experts viewed the content of the instructional material were interesting for the students for it contained fun element. The materials also up-to-date and the language used in the book were natural and real. The exercises and materials presented in the instructional material were appropriate with the students' level of

difficulty. The exercises were presented with clear instruction and could help the students who are under-achiever.

Along with the good points of the instructional material, the experts also pointed the weaknesses. First of all, there were grammar mistakes found in the instructional material. The grammar mistakes could be found in the sentences and the direction of the exercises. Mainly the mistakes were in the wrong use of be verb and plural and singular. There were also some mistyping could be found.

The next weaknesses were found in the reading section. The expert stated that some of the reading materials were too long. The reading materials were constructed by too many paragraphs and have too long discussions. The application of reading section would take too much time if the passage were too long and have too many discussions. Another weaknesses found in the reading section was the diction. The expert stated that some vocabulary in the passage of the reading section would be too difficult for the students. The vocabulary was too complex for the students of their level.

There were weaknesses pointed out by the experts in the exercises. The draft proposed to the experts was containing too many exercises. The experts viewed the exercises were as excessive. The excessive exercises were the exercise that that have the same objectives although different in type. There are some exercises that actually hold the same purpose in the instructional material, for example the sentences construction exercises in the grammar section. Another weakness pointed out by the experts was the wrong use of True or False exercises. The True or False exercises should not mix the true or false of the statement with the grammar. It should be distinguished between the true or false (T/F) exercises and the Grammatical or Ungrammatical (G/U), as in this case the exercises should be Grammatical or Ungrammatical.

The instructional material was revised based on the feedback of the experts in the expert validation stage. The first revision was the grammar mistakes found in some parts of the instructional material. Mainly the grammar mistakes could be found in the instruction of the exercises and in the reading passage.

The second revision was done in the reading section. The weakness that the experts pointed out was the length of the reading passage. The revision was done by omitting some paragraphs of the reading passage. The omission was carefully done so that the main ideas of the text were not lost. The vocabulary used was viewed as too hard for the students. The revision was done by replacing the original words with their

synonym or other relevant words. The revision in this matter was done quite fast thanks to the experts, since they already underlined the vocabularies that need to be revised.

The third revision was done regarding the exercises. The experts stated that the amount of exercises were excessive. Originally in draft, the exercises in each unit section approximately consist of five to six types of exercises, due to the revision, the exercises in each section constructed by approximately three to four types of exercises. Another weakness of the exercises was the wrong use of the True and False exercises. The revision in this matter was done by changing the direction of the exercises, originally the direction was directed the students to identify the True or False of the use of grammar and then changed into identify whether the sentences were grammatical or Ungrammatical.

The Result of Try-out

In this stage, the researcher would like to find out the applicability of the developed instructional material in the teaching and learning activity. The try-out was conducted to class A of Biology Education Departments. Since there was a limitation of time, only two units of the instructional material was tried-out, the units were unit 1 and unit 2. The try-out was conducted in three meetings, one meeting for unit one and two meetings for unit two.

Through the observation, the researcher noticed that the lecturer did not have trouble applying the lessons contained in the instructional material, although the materials, such as reading section, was not her field of study. The lecturer showed herself that she was capable in handling the materials. The observation then focused on the exercises. The observer noticed that the exercises did not make the students feel under pressure. The exercise was designed to contain fun element so that the students did not feel under pressure. Many of the exercises composed of videos and listening materials or song, thus the students did not having trouble did the exercise, in fact they seemed exited. The last point of the observation was the applicability of the media. The media contained in the instructional material was not hard to be applied. In the try-out, the lecturer applied the media in the classroom by using the digital projector and a laptop. The media also brought a good effect to the students since the students felt excited to have the media applied in the teaching and learning activity.

The interview was given at the end of the try-out meeting to both the teacher and the students. The responds of students and lecturer interview were analyzed to find out

the weakness of the applicability of the instructional material. The questions of the interview covered the topic, exercises, and media of the book.

The data of the interview showed that 78% of the students or 25 students gave positive respond by stating that the topics were interesting for them. They also stated that they were familiar with the topic, thus help them to understand the lesson given. Regarding the exercises, 72% or 23students stated that the exercises could help them to understand the lesson. The various types of exercises also make the students feel encouraged and exited, especially when the task incorporated multimedia, such as video or song. The students mostly gave positive respond toward the media, 91% the students or 29 students stated that they felt exited when the media was being used in the teaching and learning activity.

The second subject of the interview was the English lecturer who teaches English at Biology Education Department. The lecturer stated that after analyzing the complete content of the instructional material she concluded that the content of the instructional material already in-line with the syllabus. The lecturer also stated that the materials in the instructional material still in the capability of the lecturer to teach. Regarding the exercises, the lecturer stated that the exercises could actively involve the students in the process of teaching and learning. For example in the reading section, the students were required to give their opinion related to the topic of the text. The lecturer also stated that the media are applicable in the teaching and learning process.

The Final Product Revision

The revision of the instructional material was done based on the data of the try-out. Some weaknesses were found based on the data gathered through interview. The first weakness was the content of the instructional material, especially the passages in the reading section. The students stated that they were having difficulty in understanding the sentences because they consist of long and complex sentences. The revision was done by analyzing the passages and then adapting the complex sentences into simpler one without changing the context of the sentences.

The next revision was the exercises of the instructional material. The students stated in the interview sheet that it would be better if the instructional material provides example for every exercise. Based on the data, the revision was

done by adding one example for every exercise presented in the instructional material.

The Final Product

The final product of this research is an instructional material in the form of English for Biology book for Biology Education Department of IAIN Raden Intan Lampung. The instructional material has been developed through systematic stages of research and development. The instructional material was developed by collecting and identifying the data from need assessment, evaluation and revision in the expert validation stage and in the try-out stage.

The final product is English for Biology book that consist of ten units and each unit contains three sections, namely Reading Section, Grammar Section, and Speaking Section. All three sections of the instructional material were developed to match the content of the syllabus and its objective. The reading section contains reading material related to the students' field of study. The materials were chosen by analyzing the syllabus of other courses of biology. It is expected that the reading section could help the student to improve their reading skill. The second section is the grammar section. This section is dedicated to cover the content of the syllabus which is grammar materials. The last is speaking section which contains speaking materials to help the students develop their speaking skill. This section contains speaking expressions that could be used by the students to communicate in English.

The various types of exercises presented in each unit were developed to measure the students' mastery of the materials. Many of the exercises are integrated with animation videos and song so that the students could do the exercises with enjoyment. The instructional material is also integrated with online and offline multimedia technology to help the students in learning. The students could explore the online media outside of the class by browsing the internet.

CONCLUSION AND SUGGESTION

Conclusion

Based on the discussion of the material development in the previous chapter, it can be concluded that the final product of this research is English for

biology book which is intended to solve the problem found in the Biology Education Department and for the final product to be used as the main reference in the teaching and learning activity. The instructional material was developed by following systematic stages in research and development based on the procedural models suggested by Borg and Gall (1983). The instructional material was developed by considering the students level of difficulty as well as their needs and expectation based on the data gathered in the process of the development. The materials also can help the students to achieve the objective of the syllabus that requires them to develop their basic English skills by providing them the special sections in the instructional material which are focused in developing the required skills.

Suggestion

There are some recommendations for lecturer who implement the developed instructional material in the teaching and learning activity, for the head of the department, and for the further researcher. It is advisable for the lecturer who wants to implement the developed instructional material to do a lot of reading related to Biology field of study, since the lecturer who teaches English in Biology Department is graduated from English Education Department. It is advisable for the head of Biology Education Department to consider revising the syllabus since it was found that the content of the syllabus and its objectives are not relevant to each other. The objectives of the syllabus are required the students to develop their basic English skills which cover speaking skill, reading skill, writing skill, and listening skill while the content of the syllabus constructed by only grammar lessons. For the researcher who wants to continue this research for the English profession course that is taken by the students of Biology Education Department in the sixth semester, it is necessary to adjust the level of difficulty and complexity of the language. This suggestion should be considered since the level of difficulty of the materials is a fundamental factor in developing the instructional material.

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