PROSIDING ICTTE FKIP UNS 2015
Vol 1, Nomor 1, Januari 2016
Halaman:

ISSN: 2502-4124

Developing Computer-Assisted Tutorial Instructional Program for Teaching Grammar In Higher Education

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Abstract: The aims of this research were to: (1) gain information on the existing condition of learning media which are used by lecturers to teach grammar, (2) develop the proper media which is suitable for the students' need and appropriate to teach grammar, and (3) find out the feasibility of the proposed media. Research and Development method was used in this research. The research consisted of exploration stage and development stage. Observation, questionnaire, and interview were used to gain the data, while Spiral Data Analysis was used to analyze the data. From the exploration stage, it was found out that the media usually used by the lecturer to teach grammar were *Power Point* Presentation and handouts. The weaknesses of these media were lecturer dependent, bad presentation, time consuming, non-independent learning, device malfunction, and limited exercises. It was also revealed that Computer Assisted Instruction was not used to teach grammar while it was needed. Moodle based English Grammar Gate was designed as an answer to the students' need. It consisted of two major parts; they are: tutorial part and exercise part. Expert judgment was done to validate the product. The experts suggested several improvements and revision was made regarding the evaluation given. The revised product was then used in field testing to find out the feasibility of the product. Facing two field testing processes and having several revision toward the product, it was then stated feasible.

Keywords: Computer Assisted Instruction, Grammar, Higher Education, Research and Development

1. INTRODUCTION

One of many subjects in English Education Study Program which characterizes the course is grammar. Grammar, based on Hewings and Hewings (2005), is described as the sentence structure that is possible in the language, which in essence will identify certain grammatical units smaller than the sentence and give rules to explain how these are combined to make sentences. It is important for English Education students to master grammar as the basic understanding to convey meaning in communication (Celce-Murcia, 2001).

Even though grammar is an important subject, lecturers seem to have difficulties in motivating students to learn grammar. Based on a preliminary study done by the researcher by interviewing several grammar lecturers in Yogyakarta, teaching grammar to the students is a challenging matter since it is difficult to provide an interesting and motivating instruction. Based on the lecturers' experience, they prefer using traditional instruction. However, continuously teaching traditional grammar brings boredom to the students. Variation in instruction is needed to motivate the students to learn more. Ornstein and Lasley (2000) state that teaching today requires using variety of approaches, techniques, and information sources. The use of computers, scanners, CD-ROM, music CDs, audiotapes, graphics videos, cameras, projectors, cable television, and telecommunication systems can maximize curriculum content and improve students' learning.

Besides the need to develop motivating media to learn grammar, higher education needs also to ensure that the learning process would develop the students' ability to learn and think independently (Delong, 2009). That means institutions have a vital responsibility to facilitate the students to engage, interact, and be active into the learning process (Soilemetzidis in Thomas et al., 2015).

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Based on the need of media which would motivate the students to learn as well as to be independent learner, computerized media such as Computer-assisted Instruction could become a solution. Computer-assisted Instruction is one media which could be used as an instruction variation to raise the students' motivation, curiosity, and independent learning.

2. METHOD

The method used in this research was small-scale of Research and Development which was divided into two parts named Exploration and Product Development.

Exploration stage was aimed to find out the media used to teach grammar, the weaknesses of the media, whether or not the proposed product has been used to teach grammar, and the lecturer and students' expectation toward the proposed media. This stage consisted of literature review and Need Analysis. Need Analysis was done to the third semester students of English Education Study Program, Sanata Dharma University. Observation, questionnaire and interview was used to gain the data, while Spiral Data Analysis proposed by Creswell (2007) was used to analyze the data.

Product Development Stage was aimed to produce the product and check the feasibility of the product. It consisted of Product Specification, Product Designing, Expert Judgment, Field testing and Final Product. Field Testing was done to the third semester students of English Education Study Program, Sanata Dharma University. Observation, questionnaire, and interview were used to gain the data, while Spiral Data Analysis proposed by Creswell (2007) was used to analyze the data.

3. RESULT AND DISCUSSION

The result of this research was taken from questionnaire, interview and observation which then was analyzed using spiral data analysis. The analysis was used to draw a conclusion in order to answer the problem statement.

3.1. Media Used to Teach Grammar

From the observation, the researcher could find out that the lecturer used both visual non-projecting media and visual projecting media. For visual non-projecting media, the lecturer used books and handouts. Books and handouts were used moreover to support the students with series of exercises. For visual projecting media, the lecturer used projector to show a *PowerPoint* presentation. This *PowerPoint* presentation was used by the lecturer to present the material while the lecturer explained the points. This finding was also supported with the result of the interview to several students and the lecturer. The students mentioned *PowerPoint*, handouts, and books as the media usually used by the lecturer to teach grammar. The lecturer herself also admitted that the most usual media which was usually used by the lecturer was *PowerPoint* presentation as in the interview she mentioned "*So, Power Point is always provided and almost always used.*"

The finding was also supported with the result from the questionnaire. The researcher distributed 24 questionnaires to the 3rd semester students. In the questionnaire, there was an open-answer question asking about the media ever used by the lecturer to teach grammar. From 24 respondents, 21 of them mentioned *Power Point* presentation and 6 students mentioned handouts as the media to teach grammar. Since the students could mention more than one media, the answers were various. The response could be summarized in table 1.

Table 1. Students' response toward the media used to teach grammar

Media	Response (Students)
Power Point Presentation	21
Handouts	6
Song	8
Video	2
Movie	1
Picture	2
White Board	2

From the results, it could be concluded that media which were usually used by the lecturer to teach grammar were visual non-projecting media in a form of handouts and books and visual projecting media in a form of Power Point presentation.

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3.2. Weaknesses of Media Used to Teach Grammar

From the observation, interview, and questionnaire analysis, the researcher noted out several weaknesses of visual projecting media and visual non-projecting media used by the lecturer to teach grammar, they were:

Instructor Dependent. The lecturer was the one who controlled the Power Point presentation. The pace of the slides moved from one to the other depended on the lecturer's pace. By this condition, the students whose pace was slower than the lecturer could not catch up with the lecturer's explanation, while students whose pace was faster than the lecturer would feel bored of waiting. This finding was supported with the result from the questionnaire. It was found out that 87.5% of the students agreed and strongly agreed to the statement that the lecturer controlled the media for the whole class.

Bad Presentation. From the observation, the researcher found out that the *PowerPoint* presentation slide contains too much information. Too wordy slides could impact to the information clarity and lead to the students boredom. Wordy slides make the students bored of reading it and could reduce the students' attention.

Time Consuming. The other weakness of the lecturer visual projecting media was that the students had to copy the information from the *PowerPoint* presentation to their note since the lecturer did not let the students copy the *PowerPoint* file. Too much time was spent to give the students space to write the information. If the lecturer had let the students copy the file or had shared it in the students' social media group, the time could have been used to enrich the students with more exercises.

Non-Independent Learning. The projected media does not tend itself to independent study. The projection system is designed for large-group presentation. From the observation, it could be seen that the students did not have any control to the media. They had to ask the lecturer if they need to see the previous slide and it would affect the whole class learning pace. The fact that the visual projecting media could not support independent learning was also supported by the result of interview to the students. The students believed that the media made by the lecturer could not work independently for them since it needs the lecturer to give explanation about the material presented in the slides.

Device Malfunction. Visual projecting media like *PowerPoint* needs electronic devices to present it; such as laptop, projector, and wires. When one of these devices is not in a good condition, it would affect the teaching learning process. This weakness was mentioned by the lecturer and the students through interview as one of weaknesses that causes a lot of trouble.

Limited Exercise. It was found out that the book did not provide enough exercise for the students. It was proven from the result of the questionnaire. From the questionnaire statement 16, the exercises from the book are enough for the students to get some practices, the students' response showed that 75% of the respondents disagreed to the statement that the exercises from the book are enough for the students to get some practices.

3.3. The Use of CAI to Teach Grammar

From the observation, it could be clearly seen that Computer Assisted Tutorial Instructional Program has not been applied in the teaching learning process since the media used was visual projecting media and visual non-projecting media. It showed clearly the inexistence of CAI moreover CATIP in teaching learning process.

The questionnaire analysis showed that there were only limited students who had an experience dealing with tutorial computer program. From 24 respondents, there was one student who strongly disagreed to the statement 'The students do not have experiences dealing with a tutorial computer program', one student disagreed to the statement, 13 students agreed to the statement and 9 students strongly agreed. It could be underlined that there were only 2 out of 24 respondents who had experience dealing with tutorial computer program. It could be said that these 2 students got the experience dealing with CATIP from outside the grammar class since not all of the students in the grammar class had this experience.

The fact that the students did not have any experience dealing with computer assisted tutorial instructional program in grammar class was also

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supported from the result of the interview to the students. Most of the students mentioned that they did not know what Computer Assisted Instruction was, and when the researcher explained it to the students, they stated that they never experienced a class using this kind of media.

Though the students never had an experience dealing with Computer Assisted Instruction, the lecturer believed that she had ever used this kind of media to teach grammar in the past. However, since the material in the media was not made for grammar only, it could not be used to teach grammar in specific. Though it had some exercises on grammar, it really depended on the topic of the discussion. It was not practical for the lecturer nor the students. As a result, the media was not used any longer by the lecturer.

3.4. The Need of CAI to teach Grammar

Based on the explanation, it has been revealed that the media used by the lecturer to teach grammar have several weaknesses. The major concern of the weaknesses of these media was that these media could not support the students' independent learning. Lecturer was supposed to develop the students' ability to learn and think independently (DeLong, 2009). Based on Zimmerman (2008) when students are able to self-regulate their learning, they: (a) have an understanding of their own approach in learning and how best to maximize their learning in the most efficient ways, (b) are motivated to take responsibility for their learning, and (c) are able to work with others to enhance the depth and breadth of their learning. Based on the understanding, the researcher believes that the best way to facilitate the students' independent learning is by providing *Computer Assisted Tutorial Instructional Program*.

This idea is supported with the questionnaire analysis. From the statement 'A computer program which gives the students a chance to practice their knowledge on grammar is needed,' the response showed an absolute agreement from the students. From 24 respondents, 100% of the students agreed to the statement. It clearly showed that CAI was needed to support the students in learning grammar. It was also supported by the result of the questionnaire statement 'Learning from a computer is not interesting.' From this statement, 91.67% of the students disagree to the statement. From the interview to the students, the researcher also caught the students' excitement toward the idea of having a computer program to learn grammar. "*I think in this era, in 2014, this kind of media is 'mendesak' (*urgently needed)…. Of course we cannot leave the textbook, but I think we need to make use of technology more than only working with the books."* The students' opinion toward the need of the computer program to teach grammar was also supported by the lecturer. The lecturer said that it would be great if there is a computer program which provides tutorial and exercises on it.

From the facts elaborated, it could be concluded that *Computer Assisted Tutorial Instructional Program* is needed to support the students' independent learning in studying grammar. Though it had been known that CATIP is needed, finding out the students' and the lecturer's expectation toward the proposed media is also important. From the whole data analyzed, it could be concluded there were several expectations toward the proposed product, they were: (a) the explanation (material) should be presented in fun, enjoyable, and easy to be understood way, (b) the proposed product needs to provide a lot of exercises on grammar, (c) the proposed product needs to provide feedback on the students' answer which would notify the students on their answer correctness and to give enough explanation on the students' mistake, (d) the proposed product should be able to record the students' progress so that the lecturer could monitor the students' development.

3.5. Product Specification

The product specification consists of:

Program. The program in which the researcher build the product was *Moodle*. *Moodle* is a free open-source software designed to provide educators, administrators, and learners with a single robust, secure, and integrated system to create personalized learning environment. This program could be integrated with other program such as *PowerPoint* Presentation or Flash to create the tutorial. This program itself has been facilitated with many types of quizzes. *Moodle* also enables the user to give any specific or

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general feedback which could be managed as the user want. *Moodle* could also present the students' result toward their work, how long they work on it and how their score is.

Name. '*Moodle based English Grammar Gate (EGG)'* is chosen as the name of the product. Moodle based is mentioned not to break the copyright owned by *Moodle.* English Grammar Gate is chosen as the name of the product since the researcher hopes that this product would make the students enjoy learning grammar as they enter a new gate of learning.

Target. *EGG* is designed to teach Grammar in specific. Thus, the target of this product is those who learn grammar in specific. This product is designed for the third semester students of English Education Program, Teacher Training and Education Faculty.

Objective. The objective of this research was summarized through document analysis from the syllabi of 6 English Education Programs in Jogjakarta. The result of the analysis is used as a basis to develop the product. The objective of *Moodle based English Grammar Gate* could be seen in appendix 1.

3.6. Product Designing

The product designing process was always based on the objective of the product. Based on the objective, the product was then divided onto 3 major materials, they are Noun Clause, Adjective Clause, and Adverbial Clause. Each material is then elaborated to make sure that the objective of the product could be achieved. Each sub-material is elaborated in two major parts, they are tutorial and exercise.

Tutorial in *EGG* is basically built from a *PowerPoint* Presentation. To make the *PowerPoint* Presentation not plain and too wordy, it is managed carefully and uses complex animation to make sure that the students would not be bored with the tutorial. The tutorial is also supported with the voice recording to reduce wordy slides. In this tutorial, the students have their total control of their learning. The students could get back to the previous slide, skip to the next slide or jump to a certain point using the control bar. The students could also play and pause the tutorial as they wish so that the students could review a certain material as many times as they want without disturbing other students. In this point, the independent learning of the students was promoted.

Exercise is designed to give a chance for the students to practice their knowledge on certain material. The exercise is designed carefully through degree of difficulty and complexity. There are two basic types of the exercise provided in *EGG*, they are *Learning from the Question* section and *General Exercise* section.

Learning from the Question is designed to present the students a single question per time. The students are given a chance to analyze a question per time and later the program will give them the feedback whether their answer is correct or not. If the students' answer is incorrect, the students will be given a chance to reattempt the question or just jump to the explanation.

In *General Exercise,* the students are given 5 to 10 questions in a time, and the feedback will be given after the students have finished answering the whole questions. In every exercise, the students are given two attempts to answer the question. If in the second attempt the students still get a low score, the students will be suggested to take remedial exercise. Remedial exercise is set similar to the main exercise in term of level of difficulty; however, it is lower in the sentence complexity. In remedial exercise, the students are given unlimited possible attempts but the score accepted is the one from the first attempt. It is set as a consideration that in term of score, the students have been given a chance to try the exercise three times, it is considered enough for them to gain a good score. The unlimited attempt is given to give an enormous chance for the students to learn more and more.

Besides tutorial and exercise, in every sub material, the students are given a chance to have a chat with the other friends and the lecturer. This chat room allows the students to share their problem related to the material. This chat room may not be misused by the students to talk about anything besides the materials since this is an open chat room in which the lecturer is involved in the chatting process.

ISSN: 2502-4124

In every end of the material (noun clause, adjective clause, or adverbial clause) the researcher also builds a try out in which the students could test their understanding toward the whole material. In the try out, the students are given the questions of the materials which have ever been discussed in the previous sections. However, the students are only given one attempt and the students would not get the specific feedback, but only the general feedback. However, this try out gives a chance for the students who do not pass the first attempt to get the remedial test.

Supported material in a form of manual is also made to help the students to work in the program. The manual is designed using Photoshop CS6. It contains login, get used to EGG, and work in EGG. In 'login', the students are guided to log into the program using their own unique username and password to make sure that their work could not be interfered by the other students. 'Get used to EGG' would help the students to get engaged to the program easier by introducing parts of EGG. 'Work in EGG' part gives a chance to the students to know how to work in the program. 'Work in EGG' consists of work in chat, tutorial, learn from the question, and exercise. Each part would give thorough explanation on how to work on it.

3.7. Expert Judgment

Expert judgment was done to verify the product before it could be used for field-testing. The expert judgment stage was done with the cooperation of three experts who helped the researcher to evaluate the product. The experts were given the product and also the manual of the product to guide them in working in '*EGG'*. The experts were also handed a checklist to guide them in evaluating the product. The checklist consists of 5 major parts, they are: (1) Objective, (2) Content, (3) Program, (4) Tutorial Design, and (5) Supporting Materials. The result from the expert judgment gave several changes to the prototype, the changes were:

Program Accessibility. The first weakness of the program was the inability of the expert to access the tutorial since the tutorial which was in a form of SCORM package in *EGG* could not be accessed by the students, while the experts' role is as students. An adjustment on the program accessibility was needed to fix the problem. The problem could be fixed by entering the SCORM package administration and managing the permission.

Tutorial Material. Tutorial material of the *Introduction to Noun Clause* needed to be deepened. The students needed more to get the understanding of the function of Noun Clause than only the formula. The researcher needed to add the function of Noun Clause material in the tutorial. Thus, the tutorial was improved by adding the needed material.

Discourse Exercise. Experts considered that the exercise made by the researcher consisted of a lot of drilling and lack of sentence in context (discourse). Regarding to the comments given, an additional exercise is made for each sub-material. The additional exercises are carefully designed to give a chance for the students to see the use of the material in discourse.

Inaccurate Question. In addition to the improvement on the tutorial and exercise in discourse, several small changes were also made to several questions in the exercise. The changes were caused by the researcher's inaccuracy on making the questions. The changes included: subject-verb agreement, mistyping, tense logic, and word choice. These changes were made to make the questions not to bring confusion to the students who read them and the questions were not merely about the grammar formulas, but also that every sentence made brought its own meaning.

3.8. Field Testing

In order to make sure that the product designed is feasible for the students, the researcher did a field testing. This field testing was done by applying the *EGG* in the teaching learning process. The field testing was done to find out the feasibility of the product. In this research, the field testing was done twice since the first field testing showed that the product had not been feasible yet. There were several evaluations toward the product.

The Inability of the Program to Accept the Students' Natural Answer. An open-answer question brings freedom to the students to answer

ISSN: 2502-4124

based on their own understanding and could not be separated from their own way of writing. The problem occurred when the students' answer was not exactly similar to the key answer and considered wrong by the program though actually it was correct. The difference could be in a form of capitalization, construction, punctuation, British vs American spelling, or similar idea different choice of word.

Unclear Voice Recording. The lecturer's observation checklist showed that voice recording was one of the things needed to be concerned. On statement number 35 'voice recording in the tutorial is clear and helpful' and statement number 36 'voice recording pace is easy to follow', the lecturer checked 'NO' for both statements. It showed that the voice recording was one thing which needed to be improved. This result was also supported by the students' responses in the questionnaire. From the open-answer question asking about things need to be improved, two students mentioned about poor voice recording which needed to be elevated to support the students' learning process. From the interview with the students, it was mentioned that the speed of the voice recording somehow needed to be adjusted.

Lack of Example and Pictures in the Tutorial. From the questionnaire analysis, the students mentioned the lack of example and the lack of picture in the tutorial as a weakness. The result from the interview also supported the finding

The evaluations were then used to improve the program to be used in the second field testing. From the 2nd field testing, the result turned out that the "EGG" has been feasible and could be used to teach grammar in higher education.

4. CONCLUSION

The two main media which were usually used by the lecturer to teach grammar were *Power Point* presentation and book and handouts. The weaknesses of the media were instructor dependent, bad presentation, time consuming, non-independent learning, device malfunction, and limited exercise.

Knowing the weaknesses of each media used by the lecturer, the researcher proposed Computer Assisted Tutorial Instructional Program as a solution. This program was designed as an individual learning in which the students individually got engaged to the computer. The product was named *Moodle based English Grammar Gate*. It consisted of tutorial and exercises. The *EGG* had been validated by three experts through expert judgment. From the expert judgment, the researcher got several input to elevate the quality of the program.

To find out the feasibility of *EGG*, the researcher field tested the product. The evaluations from the first field testing were the students' natural answer, voice recording and the tutorial appearance. After being field tested twice, the product had been stated feasible and could be used in grammar teaching and learning proces

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