

DEVELOPING DIGITALIZED ESP TEACHING MATERIALS: ACCOMODATING THE NEEDS OF GEOGRAPHY MAJOR STUDENTS

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Abstract

The position of English for Specific Purposes (ESP) in higher education in Indonesia is only taught as one of general basic courses. It is considered a specific course in practice but not applied properly in terms of ESP theories. Thus, the process of teaching and learning in this course faces many issues including the use of appropriate teaching materials. This Research and Development (R & D) study aimed to present the development of digital based English teaching materials for university students of Universitas Hazairin (Unihaz) Bengkulu, South Sumatera, Indonesia, majoring Geography by applying materials development framework of Jolly and Bolitho model. The process of developing these materials passed four phases, i.e. first, analyzing the students' needs, second, prototyping digital based materials on the specific purposes, third, validating the feasibility of the materials designed, and fourth, assessing the effectiveness of the materials. This R & D study confirmed that digital-based English teaching materials for university students majoring Geography were very useful and effective. These results were proven by the increasing average scores gained by the students in the 4 TOEFL-like tests on the fourth stage of the research. The development of these teaching materials is expected to give worth contribution to English education field especially in English for specific purposes in the era of IR 4.0.

Keywords: English for specific purposes; needs analysis; teaching materials; digital teaching materials.

INTRODUCTION

In education, English is the language of instruction in the scope of multidisciplinary science and it leads to English for Specific Purposes (ESP), which focuses on the acquisition of professional skills integrated with various disciplines and practices such as English in education, health, economics, law, religion, and others (Nurindah and Nggawu, 2019). In Indonesia, the position of ESP in higher education curriculum is taught only as one of general basic course subjects. Although it is considered as a 'specific course' but in

practice, it does not reflect the proper implementation of ESP theory. Therefore, English teaching and learning process at this ESP context encounters many problems in terms of teaching materials, implementation and evaluation, including at Universitas Hazairin (Unihaz) where this R & D was carried out. As the result, the learning outcomes do not show maximum achievement.

In order to expose the students of a particular major to English of a specific discipline, applicable teaching material plays the key role in ESP classrooms (Bocanegra-Valle, 2010).

There was a plethora of studies conducted by scholars discussing the materials design and or development for ESP, however, the ones which developed digital-based English teaching materials for specific major, in this case English for Geography major, were still scarce. As (Apostolovski, 2019:176) argued that "... it is more than convenient to bear in mind that materials which are appropriate for a particular ESP course may not prove so efficient for other similar ESP courses". Therefore, this research was aimed to fulfill the limitation of the previous researches. Besides, global technological trend in education currently became another reason for the researchers to develop digital-based teaching materials, hence they can be accessed anytime, anywhere.

Referring to the background aforementioned above, this Research and Development (R & D) study addressed two objectives; 1) developing digital-based English teaching materials for the students of Geography department who were taking English course, 2) measuring the effectiveness of those teaching materials.

Literature review

In ESP classrooms, teaching materials are required to supply the students of certain major to be able to use English related to the context of their major, such as the ability of writing and reading a particular English text. Therefore, material developers should refer to the theories and literatures to develop effective and useful teaching materials so that the objectives of the instructions will be highly achieved. According to (Apostolovski, 2019:176), "Developing teaching materials is inevitably a process of trial and error". Several stages taken in this R & D study supported this opinion in which the researchers have passed paths in developing and digitalizing English teaching materials for Geography major students.

There are many definitions given by the scholars to ESP. ESP is defined as learner's learning reason-based approach (Hutchinson & Waters, 1987), a process of education or training which is drawn upon three domains of

knowledge namely language, pedagogy and students in a particular area (Robinson, 1991), a preparation of the learners to be proficient to use the language in 'specific' environments of academic, professional or workplace (Dudley-Evans & St. John, 1998), and the process of gaining English efficiency in specific environments (Basturkmen, 2006). From these definitions, it can be summarized that ESP refers to an approach applied in the process of teaching English based on the reasons of the learners to gain English competencies to be used in particular work environments. Thus, in order to give significant impact on the success of the students, ESP classes should be treated differently from General English (GE) as confirmed by (Alfehaid, 2019).

In academic setting of higher education in Indonesia, English is inserted into the curriculum of all non-English majors as one of compulsory subjects to be taken by the students. The instruction of English to these students is aimed to let them able to cope with any English context in their major, for example: Geography major students might need English to understand literatures under the field of Geography written in English or graduate students of Engineering might need English to be used to understand English guidance, tutorials and or specific operation procedures under the scope of Engineering area. Therefore, in these English classrooms, ESP takes its role in order to fulfill specific needs of those non-English major students. However, in its implementation, ESP is not applied properly yet, especially in terms of teaching materials. (Basturkmen and Bocanegra-Valle, 2018) said that teaching materials which commercially published as coursebooks designed by many ESP teachers do not tend to equip learners of specialized groups' needs. (Apostolovski, 2019) added that even those materials are systematic, thorough, well-designed and easy to use, but they still need to be tailored in such a way to be more appealing and relevant. Since the development of the materials is an ongoing progress, he explained further, pilot test or evaluative reviews are required to adjust the materials to the expected outcomes and current trends under appropriate field of studies.

There were numerous numbers of researches discussed materials development for ESP classes in higher education or universities including (Lapele, 2019) who investigated types of needs analysis used by the teachers to develop ESP Speaking class; (Gu, Bo, and Ren, 2019) who discussed the development of ESP teaching materials for Chinese Engineering undergraduates; (Muslimin, 2019) who developed Islamic integrated teaching materials for Islamic Elementary School Teachers (PGMI), (Sari and Atmanegara, 2018) who tried to find out what reading materials should be developed in order to increase reading skill of Accounting students. Since this R & D research aimed to develop teaching materials for students majoring Geography, the researchers also found several similar researches under this topic. (Samavi, 2013) examined Geography ESP textbooks to determine whether the materials provided meet the needs of Geography students; (Banegas, 2017) did an action research study in proposing authentic materials focusing on subject matter knowledge and language awareness-activities on students-teachers' Geography program in Argentina; (Eren and Yağbasan, 2017) who developed materials by using Geographical Information System (GIS) to provide teachers who taught Geography in Turkey; and, (Handoyo and Soekamto, 2019) who proposed a development model of Geographic instructional materials based on spatial-ecological perspectives.

From the big number of related previous studies, it was understood that all ESP instruction studies laid upon needs analysis since the main goal of ESP classes is to run English instruction which fits specific purposes of the students, hence, it is unarguable that basic foundation for teachers to prepare their teaching materials is by initially analysing what the students' needs. According to (Gholami & Osalu, 2012) and (Basturkmen, 2012), needs analysis is the identification of language and skills used in determining and selecting materials in ESP-based learning. "A comprehensive needs analysis can fill the gap between what is taught in educational institution and what is really needed in the

world" (Sari, Wienanda, Nugraheni, 2020). In terms of teaching materials, (Haryadi & Yanti, 2019) described that needs analysis of ESP students demands materials which value their engagement, linguistic needs, motivation that matches their attitudes, aptitude, learning styles, learning strategies, learners' expectations, age, culture, and local needs. (Ali and Salih, 2013) argued that in order to support learners succeed both in language learning and market employment, the best teaching materials should be searched by the teachers. However, choosing materials appropriated with ESP context is quite challenging for the course designers (Axmedovna, 2019). Therefore, this research work would give insightful ideas for those who are interested to develop teaching materials especially for ESP class.

(Gencelter, 2015) cited in (Barzani, et.al., 2021) opined that authentic material and rapid information can be accessed by the language learners through computer activities. Nowadays, almost all higher institutions in Indonesia apply computer-based learning or set up Learning Management System to organize instructional materials for effective course. The availability of teaching materials in digital platforms ease the students to learn from anywhere and at any time without the constraints of place and time (Chaubey & Bhattacharaya, 2015). "Digital teaching materials combine the words, pictures, cartoons, and audio-visual films, transferring information to digitization form" (Yang, et.al.: 2014, p. 267). In order to convert traditional teaching materials to digitalized ones, teachers are required to rearrange and re-assess the contents to be fitted as digital form of teaching materials without neglecting 'the essence' of those materials. A research study on digital learning conducted by (Lin, et.al., 2017) found that digital learning positively affects learning motivation better and learning outcome than traditional teaching does. Another research work of (Fahrurrozi, et.al., 2020) also proved that digital teaching materials significantly improved students' digital literacy. In this study, they assessed the effectiveness of google classroom digital teaching materials-based.

In responding to technological trends and be supported by previous studies on digital teaching materials, hence, in this R&D work, the researchers also designed the developed ESP teaching materials for Geography major students into digital forms. The original printed developed materials were firstly designed into non-printed. In digitalizing process, the researchers presented the materials by utilizing audios, texts, graphics, images, animations, PowerPoints, slides, photos, and video formats related to Geographical contents. Afterwards, these developed digitalized teaching materials were being uploaded to e-learning platform used by the university called SPADA. Meanwhile, the product of this digitalized ESP teaching materials was named by the researchers as 'Hi-Tech'.

Research method

This study applied Research and Development (R & D) design. (Creswell, 2012) explained that R & D has the aims to produce certain products and to test their effectiveness. In this research, the researchers developed digital-based teaching materials for Geography students and then tested the effectiveness of those materials. In the process of developing English teaching materials for the students of Geography major, four stages of R & D were implemented. First, analyzing needs. At this stage, in identifying the needs of the materials to be developed, the researchers used several tools in collecting the data, namely: questionnaire, interviews, and documentations. For the questionnaire, the theories of needs analysis of (Hutchinson & Water, 1987) and (Tomlinson, 2012) of necessities needs were modified to compose several questions listed in the questionnaire. There were 3 sets of questionnaires being modified; 2 sets of questionnaires which analyzed 'target needs' and 'learning situation'. These questionnaires were distributed to 30 students 4 English lecturers of Geography major department. Additionally, one other questionnaire was distributed to head of Geography department concerning the information of teaching

materials and syllabus applied for English course.

The interviews to lecturers and head of department were conducted to get additional information to strengthen the needs analysis of specific English materials for this major focusing on necessities based on current situation. Meanwhile, documentations used to support data collection were syllabus for English course and English teaching materials used by the lecturers at Geography major.

Second, prototyping digital materials for specific purposes. The data of need analysis got on the first step were designed by referring to the theory of teaching materials for specific purposes proposed by Barnard and Zemach combining with 'rapid prototyping' theory of (Tripp & Bichelmeyer, 1990) cited in (Fauzan, et.al, 2019). This second stage was also a-preliminary study of this R & D. Thirdly, validating the feasibility of digital materials designed. At this stage, four English lecturers and two experts of e-learning media (ICT) were involved to validate teaching materials developed and digitalized. A questionnaire modified from (Tomlinson, 2012) theory of feasibility comprising 104 items in the form of 4-Likert scale; very feasible, feasible, less feasible and not feasible, were used to determine whether or not those digital English teaching materials developed were valid and feasible. Fourth, assessing the effectiveness of the materials. On this last stage, the researchers measured the effectiveness of the materials through English tests, i.e. TOEFL-like tests by firstly made sure that the materials developed were valid and feasible. The tests were administered in 4 times in order to investigate the significant effects of these materials on the students' English proficiency level.

Results and Discussion

As it was aforementioned above, this R & D research study took four stages in the process of developing and digitalizing effective English teaching materials needed by the students of Geography major. From those four stages the results are presented below:

1. Needs analysis

The data of needs analysis, as part of preliminary study of this research, collected from 3 questionnaires. First questionnaire modified from needs analysis theory of (Hutchinson & Water's, 1987) focusing on the facet of "target needs". There were 16 statements should be chosen by the respondents (30 students and 4 lecturers) comprising the information of "Why is the language needed?", "How will the language use?", "What will the content areas be?", "Who will the learner use the language with?", and "Will the language be used?". Overall, the average percentage reached in each of the item of the statements was 81.2%. This number showed that both the students and the lecturers highly needed appropriate English teaching materials. (Hutchinson & Waters, 1987) mentioned that 'target needs' consists of necessities, deficiencies, lacks and wants. Referring to this theory, needs analysis assessed by the researchers in terms of teaching materials for specific purposes showed that these Geography major students need to be proficient in English language skills to become a geographer (necessities), however their English proficiency was low (lacks) and they still wanted to be a geographer (wants). Therefore, the development of English teaching materials designed by the researchers was required to fill this gap (deficiencies). At this point, teaching materials developed by the researchers estimated English skills needed by the students to work efficiently in the target situation.

The second questionnaire was also delivered to these students and lecturers. A total number of 24 statements were modified and composed in the questionnaire focusing on the component of learning situation. The information covered in these 24 statements were including: "Why are the learners taking the course?", "How do the learners learn?", "When will ESP course take place?". The average respond gained by each item was also high, namely 83.25. Thus, this result clearly implied that both students and lecturers needed appropriate teaching materials suitable with the purpose of English for Geography major. (Tomlinson, 2012) explained that learners should be involved in making

decision about the learning process. Their involvement needs to be accommodated by developing the existing learning materials to be more relevant. High value gained as the average score from the questionnaire strongly lead the researchers to develop existing materials of teaching to be adjusted with the current needs of the students.

The third questionnaire evaluated the availability of three aspects, namely: psychological, pedagogical, and content (as well as content and methodological), adopted evaluation theory of (Tomlinson, 2003) in (Ampa, et.al, 2013). The 47 questions in the questionnaire required the respondent, the head of Geography major, to respond to appropriate teaching materials suitable with the needs of English for specific purposes covering those three aspects above in terms of teaching materials and syllabus such as the desired topic, methodology, display of teaching materials and layout. The maximum score for the availability of all aspects was 47 which meant each item of the questions valued 1. The data gained from the respondents was only 12 or 25.53% of the maximum value. Therefore, this finding explained that appropriate English teaching materials for the students in this Geography major was not available yet.

These findings also in line with what (Agustina, 2014) found in her study that the most typical characteristic of ESP is needs analysis. This argument was also supported by (Tahang, et.al, 2021) who claimed that "before teaching an ESP course, the learner's needs must be the primary consideration to conduct" (p. 155).

2. Prototyping the materials designed

The results of the needs analysis above used by the researchers to prototype the materials design. Since the materials developed were intended to be used for specific purposes, namely for Geography major, the researchers developed the materials by applying (Barnard and Zemach's, 2003) theory of teaching materials for specific purposes. Further, the availability of e-learning platform provided by the university lead the researchers to produce

the materials that can be uploaded in that platform to ease both the students and the lecturers in accessing the materials anywhere and anytime, hence (Trip & Bichelmeyer's, 1990) theory of rapid prototyping, cited from (Fauzan, et.al, 2019) contributed to the process of digitalizing the materials in the aspects of availability and readiness of that e-learning application as the platform to upload teaching materials, exercises, assignments, and other activities.

This digital teaching materials was called Hi-Tech, as the abbreviation of H for highlighting

the students' needs I for Illuminating the current situation, T for tightening the materials to the learning outcomes, E for elevating students' English competencies by implementing teaching materials with interesting topics in accordance with the field and Geography curriculum, C for completing the materials with language components, exercise and tasks to increase students' English proficiency, H for handling the materials with a ready and safe e-learning media.

The following figure was the result of digital teaching materials prototype:

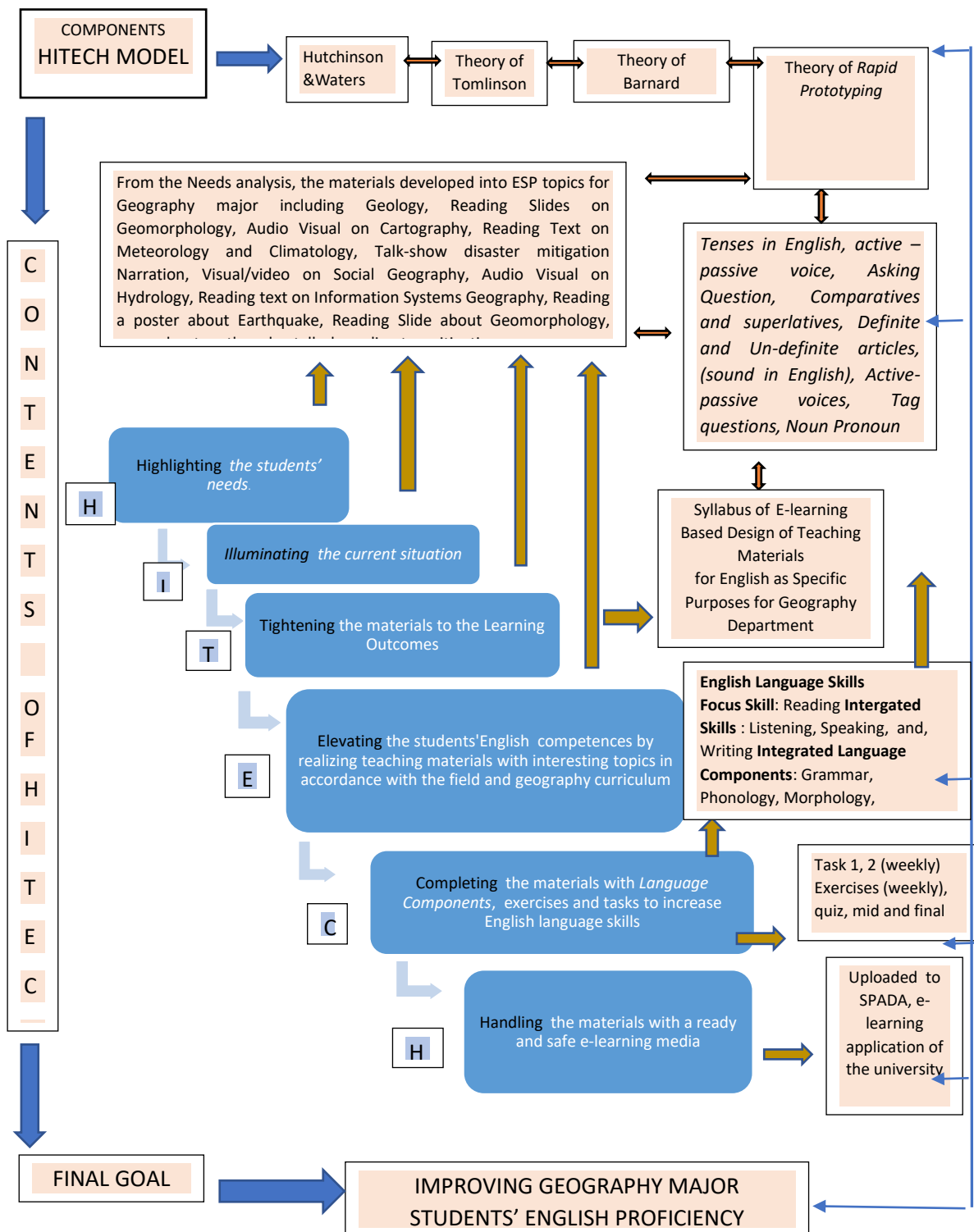


Figure 1. *The Prototype of Digital English Teaching Materials for Specific Purposes of English for Geography Major Students*

As it was mentioned previously, the steps taken in the process of developing these teaching materials were abbreviated as “Hi-Tech”. On the first and second steps, highlighting

students’ needs followed by illuminating the current situation explained that the materials developed accommodated the students’ needs and discovered the situation on how the

students and lecturers of Geography major responded to the available teaching materials. On the third step, tightening the materials to the learning outcomes responded to the information gained from the students and the lecturers who needed appropriate materials of English for specific purposes of Geography major. Thus, at this step, the researchers developed the syllabus of English subject to be suited to the expected outcomes. In elevating the students' English competencies by implementing teaching materials with interesting topics under the field of Geography major curriculum step, the researchers developed the topics discussed related to the field of sciences including Social Geography, Geology, Geomorphology, Cartography, Hydrology, Meteorology, Climatology and other related topics. Teaching materials were produced under those related topics and then the content of the linguistic component was completed.

In the next step, completing the materials with exercises and tasks was the process in which the researchers also provided assignments and tasks that covered integrated four language skills, i.e. listening, speaking, reading and writing. These skills also supported by grammar points and vocabulary items related to technical Geography. On the last step, handling the materials with a ready and safe e-learning media took by the researchers as the process of digitalizing the materials. Those teaching materials were prepared in such a way to be uploaded in e-learning platform provided by the institution.

3. Validating feasibility of the materials developed

In validating the feasibility of those digital teaching materials as the results of the preliminary study of this research, the researchers invited two experts; one the expert in English learning and the other one is the expert of e-learning media. There were three stages taken by the researchers at this validation process, i.e. first, distributing a questionnaire about the development of teaching materials adopted from the theory of (Tomlinson, 2012), second, delivering another questionnaire related to e-learning media by

applying the theory of 'Rapid Prototyping' of (Barnard & Zemach, 2003), and third, having in-depth interview regarding the e-learning media developed for English for specific purposes, in this case, for English Geography major.

On the first questionnaire, 104 questions developed from the theory were set into a 4-Likert scale to measure the feasibility of the digital teaching materials produced as the prototype in this study. The value gained from the responses toward the questionnaire was 78.2% out of 100% of the highest value. This result confirmed that the materials developed were feasible to be applied to the students of Geography major.

On the second questionnaire, a total number of 53 questions were modified from Rapid Prototyping theory aimed to assess the feasibility of digitalizing those teaching materials in terms of 4 aspects; Design, Information Media, Educational Technology and Learning Media. The questionnaire was also a 4-Likert Scale measuring the eligibility of digital teaching materials developed by the researchers. Total score gained from the responses of the respondents was 81% of 100% as the maximum score. This result revealed that the materials developed and digitalized by the researchers were eligible to be used as teaching sources for the students of Geography major.

The results noted from in-dept interview sessions explained that digital teaching materials developed by the researchers for the specific purposes of Geography major students: 1) had been equipped with a syllabus and well-planned, 2) had a clarity and complete plan of exercises and assignments, 3) were completed with the content appropriate with Geography major, 4) were accompanied by well-prepared tasks in terms of pedagogical goals, 5) had integrated all language skills and aspects of English learning for specific purposes, 6) were proper to be uploaded on the e-learning platform used by the institution, and 7) supported both lecturers and students well in the process of instruction. Therefore, the overall findings of feasibility measurement of

these teaching materials concluded that they were feasible to be used.

The step of evaluation the materials were in line with what (Stoller, et.al 2006) said that the materials under evaluative review and revision process will be likely accommodate both the students and teachers more effectively than the ones that do not.

4. Assessing the effectiveness of the materials

In order to measure the effectiveness of those developed digital teaching materials, the researchers administered English proficiency tests for four times; in the beginning of the teachings, in the middle and in the end. The tests were in the form of TOEFL-like tests. As (Hutchinson & Waters, 1987) recognized that there are three basic types of assessment, namely placement tests, achievement tests, and proficiency tests. Proficiency tests, as they further explained, are the ones that can be used to assess how well the students be able to deal with the demand of a particular situation and in ESP course, the students are required to be proficient as language learners and language users. The assessment of digital teaching materials for Geography major students in this study through proficiency tests given to the students had the main goal of seeing 'how' these teaching materials satisfied their specific needs of learning English.

There were thirty students of Geography major participated as test-takers. The test results showed the students' better improvement of English proficiency from one test to another in which the average percentage gained of that improvement was up to 74.4%. The increasing point of the students' performance from the beginning until the end of the teaching sessions by using these teaching materials summarized that digital teaching materials developed by the researchers in this R & D study were effective to be used to the students of Geography major.

Conclusion

In higher education in Indonesia, the insertion of English subject into the curriculum

of non-English major is compulsory as well as in Geography major of Universitas Hazairin, Bengkulu, South Sumatera. At this point, English is treated as ESP in which the students are required to be able to use the language both in learning context and in their future works. Thus, the materials used by the teachers are required to fulfill these needs. However, in practice, most of teaching materials do not equip these goals. The development of digitalized teaching materials for Geography major students in this R & D study proposed several steps based on theories to contribute to ESP instruction especially to Geography major. There were four stages conducted by the researchers as the guide line of R & D, namely: analyzing needs, prototyping the developed materials, evaluating the feasibility of the materials produced, and assessing the effectiveness of those materials.

On the first step, a theory of needs analysis proposed by (Hutchinson & Waters, 1987) and (Tomlinson, et.al., 2007) were applied, and the results revealed that not only the students who highly needed appropriate materials due to Geographical topics, but also the lecturers. On the second step, based on the results of needs analysis in the initial stage, the researchers produced the prototype of the materials. In prototyping the materials, theory of teaching materials for specific purposes of (Barnard and Zemach, 2003) combined with rapid prototyping theory of (Trip and Bichelmeyer, 1990) were used. On the third step, these materials were then being evaluated by the experts in two fields; one the experts of English teaching and learning, and the other one the experts of online teaching media. The evaluation showed that the materials produced were feasible and eligible to be used in ESP classes of Geography major students. The last step, the effectiveness of these digitalized materials was measured by TOEFL-like tests administered for four times; in the beginning of teaching period, in the middle and in the end. The significant increasing of the students' average scores from one test to another confirmed that these materials were effective.

Based on those findings, this research study concluded that the development of

digitalized teaching materials performed by the researchers through R & D design was able to accommodate the needs of Geography major students in ESP setting in which it was proven by the increasing of their English proficiency tests.

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