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Submission date: 22-Jan-2023 06:25PM (UTC+0700)
Submission ID: 1996884377
File name: Ginaya_2020_J._Phys.__Conf._Ser._1569_022009.pdf (493.89K)
Word count: 5185
Character count: 29157

Journal of Physics: Conference Series

PAPER · OPEN ACCESS

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To cite this article: Gede Ginaya *et al* 2020 *J. Phys.: Conf. Ser.* **1569** 022009

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English digital material development of information communication technology ICT in higher vocational education

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Abstract. The advancement of technology in the global era has driven PNB to collaborate with ASEAN country members for globalized teaching practice which is aligned with PNB's vision and mission. The digital-English course has been one of the fundamental courses in Tourism Department of Politeknik Negeri Bali (PNB). It serves the market demand nationally and globally where the skills of teaching and skills of Information Technology IT need to be obtained. However, the potentials of employing digital teaching materials in the course have not been optimized. This paper examines the effectiveness of digital-learning materials through learning management system (LMS) of English Discoveries (ED) towards the students' achievement in English. By applying quantitative and qualitative analysis, the students' English improvements were identified after giving treatments. Results of the analysis revealed that students who were given treatments had higher scores than those taught using a conventional method, which means that the digital-learning materials was proved effective in improving students' English proficiency. Additionally, they were highly motivated in learning English when the lecturer gave them digital materials. Therefore, it is suggested that the lecturer requires being creative in facilitating the teaching-learning process through providing online source of learning.

1. Introduction

Higher Vocational Education has a mission of providing professionals that qualified in the job field to compete in the global market endeavour. Considering this mission, the curriculum system of the institution is developed for link and match in line with current situations in the industry [1]. Clarke and Winch [2] explained that the student intake in higher vocational education has high motivation and self-efficacy in order to be employed in an industrial company. Many fresh graduates of high schools enrol in polytechnics and other colleges to gain the life skills to be developed for their future career [3]. This situation has given opportunity for the vocational educational management to establish a professional education, which is applicable to the demand of industrial companies [3-6].

In regards with the needs and demands of society that is literally educated in this digital era of 21st century, the educational system should be regularly reviewed in order it attains development and innovation against these demands [7]. The curriculum is required to be regularly reviewed in order to adjust with the industry demand. However, it does not mean every information fit to be adopted without adapting it for beneficial utility in the educational system. In other words, soft skills, which

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are in accordance to social norms and values in a cultural society, require beside the hard skills [8]. Hard skills of mastering digital literacy due to the current situation are required as life skills for doing the job when graduates are employed in the job field [9-10].

Lecturers, nowadays, are becoming the agent of change to their students, because in their hands students will become successful persons. In this case, one of the important stakeholders in the higher education is demanded to update his/her digital literacy in order to adjust themselves with the rapid change of ICT. Ali and Abdallaabdalganaem [11] has supported the matter of mastering digital literacy in order to be able to design digital learning materials for classroom learning process. According to McKenzie [12] computers are getting more and more widely utilized for future education. Marhaeni [13] put forward that learning in the 21st century requires life skills of utilizing technology including computers and internet, which are possessed by learners as they exposed with those skills from gadgets they get in their hand. Considering this matter in mind, learning through the implementation of digital technology with multimedia is much more preferable than a conventional one.

Greenhill [14] in his research revealed that utilizing digital technology in a classroom much more effective in terms of motivating learners in obtaining better achievements rather than still stand on the traditional method of teaching. In line with the advance of digital technology, the education institution is facilitated with computers and internet for lecturer to utilize it in the teaching-learning process [15]. The availability of the facilities make lecturers to conduct classroom action research for the effectiveness of utilizing digital technology in teaching English as a foreign language [16]. Peer collaboration among lecturers is needed in order to find the excellent way of implementing digital technology from the provided facilities of computers and internet [17].

Learning management system (LMS) provides for lecturers and students for academic purposes, such as inputting scores, conducting e-learning has caused change of educational system in a college that make lecturers to be able to create an interactive learning with their students with a wide range of time. Lecturers are always ready to give feedback for their students who curious of mastering of topic discussion in the learning session [18]. Thorsett [19] emphasized that digital technology has caused a great change of education in the 21st century, which make lecturers digitally educated [20]. This new learning era can be a challenge for lecturers to acquire the skill of digital technology for the sake of doing their duties in transferring knowledge and skills to the students [21].

Assigning lessons with take home assignments are more interesting for students in completing them rather than paper-based assignments. Balim [22] suggested that browsing materials online make students do an internet surfing related to the positive things of learning. According to Nutting [23], many things can be learned online using digital technology. Saumell [24] noted that, using internet sources for learning has made learners be active being of applying discovery learning of principles or rules to be guided in scaffolding learning technique [25]. The students' autonomous learning is possibly made through designing digital learning materials [26]. Caswell [27] stated that digital learning materials could help students cultivate their learning with the current information obtained in the internet sources. In terms of the internet sources browsed by learners, a National Center for Education Statistics [28] study showed that almost 99% of learners reported using internet sources in completing their school assignments Mansor et al [29] stated that learning in the 21st century needed skills of collaborative, problem solving and mastering the digital technology. Burt and Mathews-Aydini [30] declared that utilizing digital technology in teaching learning process had created an innovative teaching for lecturers in presenting their lessons in the class prior to learning-material design. Eison [31] also suggested that using digital learning materials with multimedia could avoid learners to be unfocused and get prone during the teaching learning process. Huang and Wang [32] in their research reported the instructional design teaching strategy by utilizing digital materials could make both teachers and learners digitally educated.

All reviewed literature above give some insights on the developing of classroom digital materials, yet they could not discuss the matter of improving the students' English proficiency in the charm of integrating face-to-face and online learning at higher vocational college. Therefore, this research was aimed at finding out the effect of implementing ICT digital learning materials through learning

management system (LMS) integrated to face-to-face conventional method towards students' English proficiency at vocational college. The statement of the problem can be formulated as follows.

1. Could the students in the experimental group achieve better than those in the control group?
2. Are the achievements because of the implementation of ICT digital materials through LMS ED?

2. Research Method

2.1 The design method of the study

In the purpose of identifying whether there is different achievements between the control and experimental group, then pretest-posttest control design method was applied. The experimental group was facilitated with learning management system of English Discoveries (ED) and on the other hand, the control group taught by using conventional method based on the structure of the textbook, which mostly deductively presented. At the end of the meeting session in each cycle of learning, the scores of the students in the experimental and the control group were compared to determine the progress of students' English proficiency.

2.2 The subject of the study

This research was carried out in the even semester of 2018/2019 academic year of the Travel and Tourism Study Program, Tourism Department at State Polytechnic of Bali. As it is suggested in the principles of classroom action research, it was only taken the fourth semester students. By applying the purposes random sampling technique, from the fourth semester students that consisted of two classes then randomly assigned 40 students, twenty each for control and experimental group.

2.3 Method of collecting data

Kemmis and Taggart [33] put forward the principle of classroom action research from planning until reflection. The action is the real activity conducted and it is observed to reveal the effectiveness of the teaching method applied. By this method, the data of this study was collected in a six-week classroom meeting. The experimental group received researcher-designed Web Quest (web-based activity) as a project task through LMS network of ED. Therefore, the first stage of this e-learning model, the students needed to log in to the portal link of the e learning by entering user name and password. After they were able to log in then they could register by inputting their personal data. After doing the process of registration, the students could access the system anywhere or any time by entering their user name and password to log in. All data collected based on the students' performances of their English skills was recorded in the observation sheet and using audio-visual instrument.

2.4 Data analysis

After both groups were taught using the respective methods, the collected data firstly was analyzed using SPSS-17.0 program and a t-test was computed for the similar level of the experimental and control groups. Whereas, the SPSS analysis of students' scores in paired sample t-tests the post-test after the treatments given were computed in paired sample t-tests. Through this analysis, the differences between the pre-test and post-test in each group could be investigated. From the investigation, the problems which caused students could not improve their English proficiency [34-35] could be identified.

3. Findings and discussion

Based on the data analysis applied in this study, it was found that the implementation of ICT digital learning materials through LMS of ED were effective in enhancing students' English proficiency. These analysis results were discussed based on the formulation of the research questions related to the implementation of digital technology manipulated for classroom teaching.

3.1 The result of pre-test

The subject course learned by the fourth semester students was called English for Tourism and Event. The topics discussed for this course were related to the context of tourism and organizing events, which

locally often termed as MICE (meeting, incentive, conference, and exhibition). The LMS ED has several topics for the students' level or pre-intermediate level so that it was selected some topics, which were related to English for tourism and event. The students learned the subject course in the 2 meeting sessions per week. Firstly, in the first week, the conventional teaching model was used to teach the experimental and control groups. In the second week a pre-test was administered for the both groups. The test was taken from TOEIC since the students studied in Polytechnic as a vocational education and they will use English for global communication later in the tourism industry, such as Travel Agent and Destination Management Company that organized events. Therefore, the integrated language skills, which consist of listening, speaking, reading, and writing, were assessed. The scores achieved by the students were summed up and divided by 4 to get the final scores and then analyzed using SPSS program for the mean scores as it is shown in table 1.

Table 1. The result of pre-test

Method	Group (No)	Mean	St. deviation	t Value	Sig. (2 tailed)
Conven	Con (20)	53.9331	6.11262	.409	.684
Conven	Exp (20)	53.3369	5.53533		

3.2 The result of post-test

The scores achieved by the students in the pre-test were categorized into low as the minimum passing grade for the semester, which is belong to English for special purposes (ESP) is 70. There were many students got the scores of below 60 that means far from the minimum passing grade. This proved that conventional teaching method was not effective applied in the class. This result became a starting point to do a research of implementing digital material development through LMS ED for the experimental group. Different from the teaching instruction in the first week, which needed one class for all students, the following instruction was started by dividing the students into two classes based on their respective groups, experimental and control groups. A class for the control group remained to receive the conventional instruction for other topic discussions. Whereas, the experimental group taught by using digital material through LMS ED.

Since the instruction given to the students in the control group was not much different from the first instruction, it will be focused to describe the teaching-learning process for the experimental group. The teaching instruction conducted for the experimental group at the beginning was preparing an instructional planning or teaching learning scenario and instruments. In this case, the proportion of face-to-face and online instruction is 60% and 40%. This proportion is inline with the policy of the institution. From this proportion, the digital materials could be divided into two main categories, namely materials, which were selected from the ED that related to English for tourism and event and the research team designed other materials, which were taken from online sources. The materials from ED program was in the form of video with practices and the own-designed materials were focused on communicative activities, such as brainstorming, pair works, group discussions, role-plays, language games, problem solving, and web quest. Those materials were presented in the three learning cycles.

In the first cycle of learning, the research give instruction concerning the application of ED program and then give password to each student in order to be able to access the program. After the students accessed the program, they first would learn about listening from video of dialogues selected in the program with the topic of *living in a foreign country*. Through this program, the students could practice pronunciation, vocabulary, reading and writing after watching the video. In the following meeting session, the students received the researchers' designed-materials for communicative activities, which were facilitated with brain storming, pair works and group discussions. When the action was given, the students' performances for the practices in the ED program and the communicative activities were recorded in the observation sheet. In the third week a post-test were administered for the control group

and the experimental group. The whole observation of the first learning cycle, it was found that the students still felt not too confident and the slow students found themselves still difficult to adapt with others in the group discussions. This problem was taken into account to do a reflection for the next cycle. The result of the reflection aroused a solution that role-plays and language games were applied in second cycle.

In the second cycle of learning, the students watched a video of dialogues on *traveling to other countries*. There were some practices to complete for the students after watching the video and the lecturers could monitor their works in doing the practices online. In the following meeting session, the lecturers gave them communicative activities, which were facilitated with role-plays and language games. The lecturers recorded their performances in the observation sheet. Similar to the first cycle, a posttest was administered for both groups in the fifth week. It could be described that role-plays and language games made the students feel secure in learning English and the class became more alive than in the first cycle. The problem found in this cycle was despite their confidence in learning; some of them still looked at their friend's work. Regarding this problem for reflection, it should be an independence task given in the following cycle. Therefore, problem solving and web quest project would be the facilitation of the communicative activities.

In the third learning cycle, the students watched video with the topic of *describing holidays, festivals, and customs* and then followed by completing all practices provided in the program. In the following meeting session, the students were given communicative activities of problem solving and web quest project. Before doing the activities, the students are divided into small group of 4 students to complete the activities online through the LMS ED program. These activities could be continued outside the class when time allotment in the class was over and the assignments would be discussed in the following meeting session. When the students presented their works, they performed much better than the previous two learning cycles, as they are highly motivated in learning English. The research was stopped because it only consisted of 3 cycles.

The last activity of the research was administering the post-test of TOEIC for both experimental and control groups. The result of the posttest then computed using SPSS program in which the mean score of the students in the control group was 63.05 and 84.43 in the experimental group as it is shown in the table 2.

Table 2. The result of post-test

Instruction	Group Number	Variable	Mean		St. Dev		t value	Sig. (2-tailed)
			Pre-test	*Post-test*	*Pre-test*	*Post-test*		
Conventional	Conventional 20	English Proficiency	55.44	63.06	5.72	6.69	-5.42	.000**
e-learning	Experimental 20		55.26	84.43	5.06	4.64	-23.49	

**significant at .05 level

3.3 The analysis of ANCOVA

The mean scores of the students in table 2 indicated that the students in experimental group achieved much higher than those students in the control group. Further analysis was computed the students' mean score as the result of giving the treatment, either in the practices and communicative activities. For this purpose, it was used an analysis of covariance (ANCOVA). The result of the analysis is shown in the table 3.

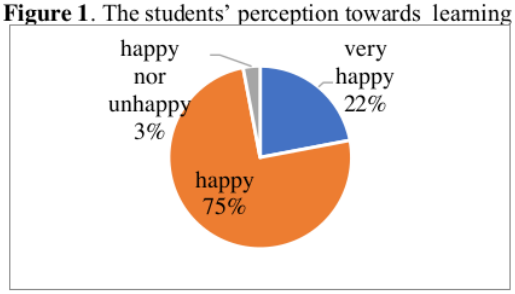
Table 3. The ANCOVA tests

Instruction	Group Number	Variable	Mean	St. deviation	F	Sig. (2-tailed)
Conventional	Conventional 20	English Proficiency	63.0536	6.69209	90.888	.000**
e-learning	Experimental 20		84.4348	4.64979		

**significant at .05 level

Additionally, students' perception towards the application of LMS ED program and the technique of teaching facilitated for the communicative activities was showed by the result of the questionnaires on each cycle of learning. There was 22% of the students said that they were very happy and there was 75% of them said that they were happy, and 3% said that they were happy nor unhappy about the application of the learning method. The students' perception is shown in the figure 3.

Figure 1. The students' perception towards learning



4. Discussion

The comparison of the students' achievement in the pre-test and post-test indicates a significant improvement of their English proficiency. This is very important to be discussed in order to be able to judge that LMS ED program and communicative activities facilitated with brain storming, pair works, role-plays, language games, problem solving, and web quest project are considered effective for improving the students' English proficiency. The advantages of LMS ED program were enable the students to practice their English in real situation as it is what the native speakers are usually done because the students could witness the video in the program. After they watched the video, they could practice their English with some aspects of the language, such as pronunciation and intonation, vocabulary, and grammar, by doing the activities provided in the program. For example, the dialogues spoken in the video could also be displayed their extract text after the students listen them in the video. They could practice pronunciation and intonation from the extract text by listening the native speakers and then recorded their own voices by selecting phrases or sentences of the text and it would show the result from the bar given by the application. The students could also trace their mistakes to learn and tried again for improvements. In addition, the same practices were also provided for practicing vocabulary and grammar.

Communicative activities which were given after watching video and doing practices in the LMS ED program were facilitated with different techniques in each learning cycle in order the students have wide opportunity to practice their English, especially for the productive skills, speaking and writing. The techniques for the facilitation of the communicative activities were applied in such a way as the students could make a progress in their learning gradually. The application of the techniques was considering the high order of thinking skills (HOTS). Brainstorming, pair works, and group discussions applied in the first cycle as the beginning stage of the learning, and then continued by role- plays and language games in the second cycle, and finally in the third cycle was applied problem solving and web quest project.

The application of the teaching method trough LMS ED program and the techniques applied for the communicative activities had made the classroom interaction much more alive than the conventional method which merely based the learning that the teacher is a resource person so it tends to make the method of learning is teacher centered. Whereas, the method of teaching through LMS ED with digital material development were enable the students to improve their English proficiency. With quality e-learning content and online activities with various activities or interactions, students will be active, creative, happy, motivated and engaging, and independent. In addition, learning content enriched with multi-media can facilitate student understanding.

5. Conclusion

The students' improvement of English proficiency is not achieved instantly without constant practicing endeavour. Practicing is the keyword in the application of LMS ED and techniques applied in the communicative activities. This insight is in line with the principle declared by Bruce Lee that "Knowing without practicing is nothing". Therefore, it can be concluded that the implementation of ICT digital learning materials through LMS ED can improve the English proficiency of the fourth semester students at the vocational college. The improvement achieved by the students here is also supported by the fact that the application of practices provided in ED program and techniques of active-learning activities can improve the students' learning motivation and interest. As a result, they can interact actively during the entire process of learning. Therefore, the application of the e-learning activities in the classroom is really needed in order students can maximize their English language skills.

Considering on the conclusion formulated above, the essence of ICT digital learning materials through LMS ED can be used as an alternative technique or activities in English class. The lecturer should be active in facilitating the learning through the application of online activities so that the activities can encourage students' critical thinking skills, such as comparing, classifying, inducing, deducing, analysing errors, constructing support, abstraction, analysing perspectives. The lecturer's creativity in designing fun and lived communicative activities will be able to stimulate their learning interest and motivation.

Acknowledgement

The authors address their thanks to The Ministry of Research, Technology and Higher Education for funded the authors' research in the scheme of PTUPT 2019 and the fourth-semester students of Travel and Tourism Study Program in 2018/2019 academic year as the participants of the research.

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