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Teaching Language Proficiency: The Implementation of Virtual Multimedia-Based Learning for Indonesian Vocational High School

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Abstract: For enhancing the learning and teaching process, various efforts have been made to offer alternative ways. Mobile devices, by their wide coverage of wireless networks, are one of them to be used to support instructional processes in the educational sector. Mobile-assisted language learning (MALL) can significantly improve students' acquisition of language learning. Due to the possibility to be utilized anywhere and anytime, mobile learning has become the main option or reference as the learning model. In order to give and significant result of its application be effective and successful, it must be organized properly and correctly by combining all related elements interacting in optimum ones. This paper aims to explore the roles and the impact of media in terms of technology in English Proficiency of Test of English for International Communication (TOEIC) for vocational high school students. Including technology in the English proficiency test to prepare vocational high school students entering and competing in the career of global perspective is an innovation to link and match school and users. It is development research through ASSURE instructional design involving eighty students with various English levels. The study found mobile multimedia for language learning more effective in uplifting students' achievement scores on the TOEIC compared to the control class. By this acceptance, it has implications that educators or affiliated stakeholders conducting educational services by designing the curriculum corresponding to their needs of language acquisition and mobile assisted devices enabling them to have independent and interactive study.

Keywords: mobile learning, learning materials, Test of English for International Communication, vocational high school.

教学语言能力：基于虚拟多媒体的印度尼西亚职业高中学习的实施

摘要：为改善学与教过程，已作出多项努力以提供替代方法。由于无线网络覆盖范围广，移动设备是其中之一，可用于支持教育部门的教学过程。移动辅助语言学习（购物中心）可以显着提高学生的语言学习习得。由于可以随时随地使用，移动学习已成为学习模式的主要选择或参考。为了使其应用的显着结果有效和成功，必须通过将所有相关元素组合成最佳元素来正确和正确地组织它。本文旨在探讨媒体技术在中职学生国际交流英语能力测试（托业）中的作用和影响。将科技纳入英语水平测试，为职业高中生进入全球视野并参与职业竞争做好准备，是一种链接匹配学校与用户的创新。它是通过保证教学设计的发展研究，涉及八十名不同英语水平的学生。研究发现，与对照班相比，用于语言学习的移动多媒体在提高学生托业成绩方面更有效。通过这种接受，教育工作者或附属利益相关者通过设计符合他们语言习得和移动辅助设备需求的课程来提供教育服务，使他们能够进行独立和互动的学习。

关键词：移动学习，学习资料，国际交流英语考试，职业高中。

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1. Introduction

The Indonesian Law Number 20 of 2003 concerning the National Education System explains that the national education system must be guarantee equal education opportunities, increase the quality, relevance, and efficiency of education management to face challenges following the demands of changes in local, national, and global life so that educational renewal is properly planned, directed, and sustainable. The law has accommodated the principles of regional autonomy, namely to make it easier for educational coaches and implementers to face life's challenges independently, intelligently, critically, rationally, and creatively. It needs to be realized that the 21st-century world has opened up and requires competitive human resources. The ICT in teaching and learning can enhance understanding and is applicable in a student's daily life [1].

The government determines education as one of the priorities in the 2015-2019 National Medium-Term Development Plan (RPJMN) and the 2005-2025 Long-Term Development Plan (RPJP). Today, Vocational High Schools (SMKs) must be able to produce competitive graduates who are competent in their fields of expertise and can be absorbed by the business and industrial worlds. Concerning education development, the government is focusing on implementing four themes during 2005–2024. The first is 1) capacity building and modernization during the period 2005–2009. This theme is spelled out in the RPJMN-I, which includes restructuring the Republic of Indonesia and building a safe and peaceful Indonesia that is just and democratic and has a good level of welfare. The second is 2) strengthening services between 2010 and 2014, as stated in RPJMN-II: strengthening the restructuring of the Republic of Indonesia, improving the quality of human resources, building science and technology capabilities, and strengthening economic competitiveness. The third step involves 3) increasing regional competitiveness during 2015–2019 as stipulated in the RPJMN-III: consolidating the development of economic competitive advantage based on available natural resources, quality human resources, science, and technology. This is followed by 4) raising international competitiveness during 2020–2024, as stated in the RPJMN-IV, which seeks to empower Indonesian people who are independent, advanced, just, and prosperous through accelerated development in all fields via a strong economic structure based on competitive advantage [28].

The existence of SMKs aims to prepare middle-level workers who are responsible and competent in certain fields [14]. Therefore, the SMK curriculum must be able to bridge the needs of industry and students so that graduates have competencies that match industry demands [3]. The number of graduates from a vocational high school who are absorbed by the industry sector indicates the suitability of the curriculum to industrial needs. This is in line with the aims of the Association of Southeast Asian Nations (ASEAN) Economic Community (AEC), which has been in effect since December 31, 2015 and poses a new challenge for Indonesian education (especially SMKs, which act as providers for the labor market). MEA requires skilled labor in all fields. Some characteristics of the early stages of the implementation of MEA are the free flow of goods, services, investment, capital, and skilled labor, priority integration sectors, food, agriculture, and forestry. In Indonesia, the workforce is still dominated by graduates of basic education, reaching 60% of the currently working population [16].

Based on a survey conducted by the World Bank in 2008, employers stated that the requirements for upgrading skills and the existence of high-quality standards and of a more competitive and export-oriented business environment were the main drivers for the increase in job requirements. This is in line with Indonesia’s aspiration to become a high-income country, macroeconomic trends (ASEAN, rising wages in China), and an increasing middle class (which will demand higher-quality products and services). With all the complexity and competition that exists, there is no choice for prospective workers—in this case, junior high school graduates—but to continually hone their skills and gain more expertise in their fields. In the context of the AEC, the abundance of workers who can move from one country to another can be seen as a great opportunity for career development via the experience and work prospects that working abroad can bring. However, graduates are required to have both hard and soft skills that meet certain requirements and generally apply in their respective fields.

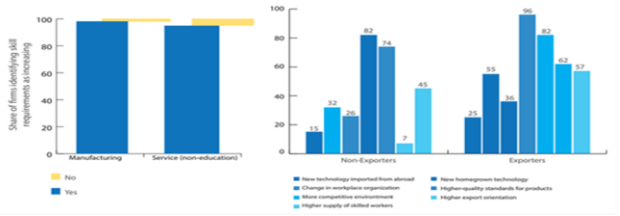

Fig. 1 Company survey results

At the end of 2015, the AEC and the fact that Indonesia’s demographic bonus until 2030 has become a byword attracted a lot of attention from various parties. The international community views Indonesia as a country with a very large population and abundant natural resources. In other words, Indonesia is seen as a potential market prospect and an abundant supply of raw materials. In this context, communication skills are considered to be important in bridging the existing opportunities for working domestically and/or across countries, which requires the use of English almost exclusively in most fields of work.

The fast-growing field of education in the modern era is due to the emergence of Industry 4.0, which opened up numerous opportunities for a more dynamic,

sophisticated, and flexible teaching and learning process. Many aspects of life have changed due to information technology and the Internet [4], which influence academic achievements by opening opportunities to work from anywhere [5]. New media, as a result of technology, bring different experiences to teachers and students, as well as to language learning. To become bilingual speakers, learners need internal and external motivation, including support from any resources and having predominantly positive attitudes toward language acquisition [6]. English can be the mediator that connects and engages learners to gain metacognitive skills [7]. Mobile learning (M-learning) is one means of educational technology that encompasses the use of devices such as computers, laptops, tablets, smartphones, and personal digital assistants (PDAs) [8], [43]. Mobile phones or smartphones are used every day by teenagers or youth due to their affordable prices. Their demand is increasing rapidly for many purposes, such as social media access, sending emails, browsing for information, and Internet surfing. Learning activities should include these technologies as part of M-learning to promote interactive, interesting, and motivational instructional material that links teachers and learners with out-of-classroom activities [9], [42].

In general, M-learning expands learners' access to information to improve their performance [10]. It makes it possible for them to access content or any information related to the course or subject learned without constraints in time or space by using the Internet and mobile technology. M-learning is enabled by mobile devices [11]. At the very beginning of integrating technology into learning activities, the focus was on bringing and implementing the technology into the classroom, as is often the case in mobile learning—which, from today's perspective, has changed significantly. The term M-learning now refers in an informal way to mobility of learning that takes place outside the classroom [12]. It provides an opportunity for education that is managed by technologies in any device that is autonomous and small in size to get along with the users with no time barrier [13]. The facilities that are available in M-Learning that support the application of multimedia provide an additional accessibility for learners to have varied and diverse options for learning resources. Since a digital device is included in M-learning, it can be operated by users, teachers, and students to have adaptive, productive, communicative, collaborative, and investigative learning activities in dynamic situations and locations [15]. Future language learning as in the case of critical reading require learning to be combined with local cultural components to make teaching materials contextual [2].

It is obvious that portable devices with built-in technology are available in many forms and options. With regard to learning activities, mobile phones, particularly smart phones, are the most commonly used device to integrate in the instructional process [16], [17]. Besides, since several studies are contained within it, it can be functioned to maximize instruction [18], encourage location-based learning [19], and facilitate knowledge transfer [20].Given the advantages that are offered by M-learning, it has a huge potential to be implemented for multiple subjects or courses as well in language acquisition. It is distinctly beneficial to the peers and instructors since they now have access to practice communicative language, genuine content, and complete the tasks [21]. It is an effective media for language learning of common terms [22], [23], contributes to positive feedback on motivation and attitudes on language learning [24], and develops the skill of language in a constructive way [25], [26]. The learning of language and related topics including the TOEIC can be facilitated by means of technology of Mobile-Assisted Language Learning (MALL). It is recommended to apply MALL to face the obstacles to acquiring a foreign language [41]. MALL can affect learners' mastering language vocabulary [27], peer-to-peer connection [28], boosting students' motivation and communication skills in language learning [29].

2. Method

2.1. Research Design

This research is experimentation, in which individuals are not placed in a completely randomized group [13]. This research will determine the effectiveness of intermediate learning. The experimental group was subjected to action presented using a computer/smartphone. The control group carried out TOEIC learning activities presented using print learning resources. The research design is described below.

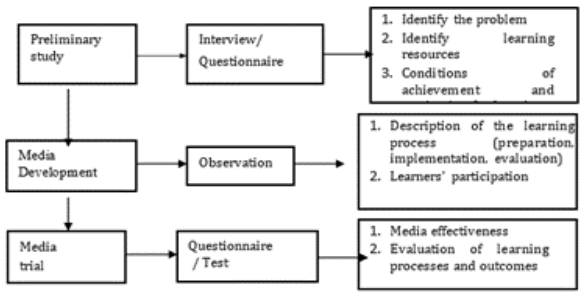

Fig. 2 Research flow design

2.2. Sample and Data Collection

This study included eighty participants, dividing them into experimental (n = 40) and control groups (n = 40) in a pre-test and post-test. The learning media applied during the instructional process was also adjusted to their group consisting of installed TOEIC digital book in smartphone (Experimental group) and printed book version (Control group).

2.3. Data Analysis

Each class took 15 meetings with different learning sources to carry out their language learning activities in and out of the classroom. Both groups were given a set of questions standardized for the TOEIC to expose their prior knowledge in the subject matter. After finishing the instructional process, including some sessions, both groups were given a post-test to measure the effectiveness of the used media in assisting their mastering language skill. The TOEIC includes listening (100 items for describing pictures, question-response, short talk, conversation, discussion) and reading (100 items for sentence completion, text completion). The test was presented in multiple-choice format with 200 questions for two hours with a threshold score of 400-900. The test itself is divided into six levels: Level 0/0+: Novice (score of 10-250), Level 1: Elementary (score of 255-400), Level 1+: Intermediate (score of 405-600), Level 2: Basic Working Proficiency (score of 605–780), Level 2+: Advanced Working Proficiency (score of 785–900), Level 33/3+: General Professional Proficiency (score of 905–990).

3. Result

The collection of empirical data related to the models, media, and assessments used by the teachers was then followed by interviews to analyze the needs of teachers and students at the Surakarta Vocational School. The teachers' and students' interviews show that learning the TOEIC at Surakarta vocational high schools still finds several shortcomings, causing students' low achievement of TOEIC scores at the study period end. The obstacles to TOEIC learning faced by students are the differences in competency standards and the material distribution between the vocational English competency syllabus and the TOEIC test syllabus, the absence of weekly structured and scheduled face-to-face learning focusing on TOEIC learning because the hour distribution is full, the applicable curriculum, the breadth of material coverage that students must master with only four meetings comprising pre-test, listening section, reading section, and post-test, and the absence of other alternative learning media that students can use as learning resources able to respond to space and time limitations like those in conventional learning.

Two sources of learning media, printed books and digital learning materials, were applied by the teachers in the class. The instructional process differed by sources of materials leading to the learning outcomes. Fig. 3-6 illustrate it.

Fig. 3 Classical instructional process

Fig. 4 Students' conventional classroom activities

Fig. 5 Independent learning process by digital materials

Fig. 6 Digital sources of students and teacher's classroom activities

The experimental study was conducted over a 10-week period. The sample comprised of 80 12th-grade students randomly chosen from two vocational high school educational streams. The selected individuals were randomly assigned to either Printed Material Group (PMG) as the control group (n = 40) or Digital Material Group (DMG) as the experimental group (n = 40). During the first session, all participants completed a pre-test covering all the items or indicators included in the TOEIC language proficiency test. During the subsequent 15 sessions, conducted at 5-day intervals, the two groups underwent different treatments. In the final week, they were given a post-test.

After 10 treatment sessions, participants were introduced to the TOEIC consisting of describing pictures, question-response evaluation, short talk, conversation, discussion, sentence completion, text completion. To prepare for this test, students assigned to the PMG were given instruction based on English Grammar in Use [30]. Upon lecture completion, they were asked to work on the relevant exercises in their textbooks. The instructors continually monitored their work and provided guidance to students that gave incorrect responses, focusing specifically on the listening and reading aspects of the TOEIC. The same approach was adopted for the DMG, but these students were given digital materials to study on a computer and were allowed to access the internet to obtain additional information if needed. At the end of the session, they completed exercises and quizzes available on digital platforms to test their knowledge of the studied materials.

Table 1 Participants' demographic characteristics

Demographic characteristics	Categories	Frequency	%
Gender	Male	90	53.9
	Female	77	46.1
Age	16 years	53	31.7
	17 years	81	48.5
	18 years	33	19.8
Experience using e-learning	Less than one year	72	43.1
	1-3 years	2	1.2
	4-6 years	0	0
	> 6 years	0	0

Upon study completion, the two groups' pre- and post-intervention results were analyzed and compared. As shown in Table 1, the experimental group had a higher mean score (410) on the TOEIC than the control group (330). A covariance analysis (ANCOVA) between groups in one way was done to find out whether the difference between them statistically to be significant. The scores of pre-tests used to analyze covariate in the pre-test are shown in Table 2.

Table 2 Descriptive statistics of both groups' pre-test

Group	Mean	SD	N
Experiment	220	6.240	40
Control	240	6.296	40
Total	230	6.253	80

Table 3 Descriptive statistics of both groups' post-test

Group	Mean	SD	N
Experiment	410	9.356	40
Control	330	7.102	40
Total	370	7.321	80

The students' scores on post-test were also calculated by the ANCOVA to figure out the significant difference between the experimental and control groups at the post-test phase (F (1.74) = 92.536; p = .000; partial eta squared = .637) obtained in the experimental class. Based on Table 2, it can be inferred that TOEIC digital books installed in the smartphone are more effective for language learning than printed books.

Table 4 The result of ANCOVA calculation

Source	Type III Sum of Squares	df	Mean Square	F	Sig	Partial Eta Squared
Corrected Model	341.200	2	2421.670	201.540	.000	.931
Intercept	49.871	1	49.871	7.250	.052	.164
Pre-test	2104.943	1	2104.943	190.600	.000	.912
Group	305.832	1	305.832	92.536	.000	.637
Error	264.078	74	12.473			
Total	351946.204	77				
Corrected Total	1894.031	78				

Technology integrated into the learning activities creates a positive and supporting environment for language learning. The results showed a slight difference and contrast in the gained scores on the post-test between those two groups using digital mobile media and traditional printed books as the source for language learning, especially in the TOEFL. The students in the experimental group using mobile learning media improved their skills more significantly than those using the printed version of the identical books. It is in line with [31], who stated that foreign language learning is motivational, establishes constructive attitudes by integrating technology in mobile learning. It also supports learners with low confidence in a language course to demonstrate their skills better [32].

Fig. 7 Digital multimedia feature on language learning

M-learning is more spontaneous than other types in the context of students' awareness of having to learn with no limitations. The field of education has

obviously been transformed by the evolution of the traditional classroom into a more flexible kind of education [33]. The small size of portable electronic devices [34], [35], [36] provides more opportunities for blended learning wherever students can do their tasks, projects, etc., effectively reducing the need for face-to-face interaction in the classroom [37], [38], [39]. Learning in this way also provides an independent and private type of study where students can practically and efficiently access, find, and gather information by themselves [40].

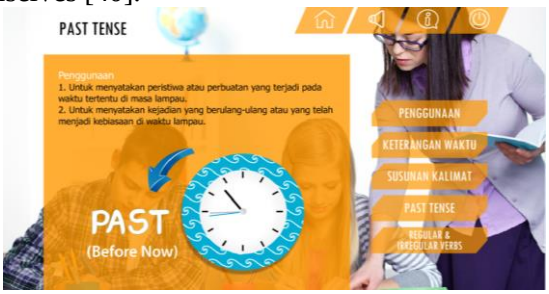

Fig. 8 Mobile-assisted language learning app material

The use of smartphones as a device for M-learning when learning the English language has had an impact on students' speaking and listening skills. This can be demonstrated when reading and listening skills are integrated into the language learning system, as occurred for the teaching of grammar and vocabulary, for example in the TOEIC. Such versatile mobile technology provides not only improved comprehension options but also potentially explores more opportunities to improve students' reading and listening skills. M-learning reinforces the English language learned for TOEIC, one of the most reputable international courses, to improve workers' skills. It helps to construct a framework for learning outside the classroom that is tailored towards the students' interests and needs.

The development of sophisticated multimedia and advanced technology led to the dynamic adoption of various resources, with an educational angle, as new learning resources. It created the need to provide some form of support system, physical and/or non-physical, to enable learners to succeed in their studies. The existence of technology that can connect and extend the available resources to improve outcomes, means that dynamic learning has additional influence in areas such as spatial ability and initial learning of new material [40]. As a mental process, the learning becomes integrated into previous relevant knowledge and connected with any associated memories. In language learning, the availability of resources for learning, for example access to a multimedia platform, is a vital indicator of whether students will successfully reach the expected goals. M-learning links into certain aspects of internal reward, in the form of self-esteem and/or self-motivation. The reduction in the rate of second language acquisition, due to the lack of learning resources, caused Korean English learners to have less motivation for their studies.

The results of this research show that the implementation of multimedia, in terms of mobile-assisted language learning, improves students' motivation, interest and ability to reach effective, targeted, learning goals. The intervention of technology has brought a revolution in foreign language learning by providing students with a medium for self-study in the most practical and efficient way possible. There is increasing acceptance, both of the role of educational technology, in providing resources in this fast-growing area, and of the need to integrate technology into the educational process, especially in second language learning. Educational technology comes as a teaching aid to assist learners to develop proactively and experience their learning opportunities by following their own internal impulses, as occurred when they were given motivational support. In addition, the outcomes highlighted in this study indicate that the use of multimedia for learning improves students' performance, not only in cognitive tasks but also non-cognitive ones, for example tasks involving established communication skills.

4. Conclusion

Mobile technology using smartphones to learn English has some benefits compared with the traditional hard and printed files. They are practical, efficient, effective, and, most importantly, portable. It gives students a better experience of learning by what is occupied with audio, visual, and multimedia features. It facilitates students to maximize their English proficiency test of TOEIC score into significant achievement. Mobile learning installed in electronic devices for language learning is an innovation of MALL development to facilitate students' achieving learning goals and additional competence in career perspectives. This study is limited to the students in the third grade of vocational high school as the research sample.

Based on the findings of this study, it is recommended that digital language teaching materials be applied more frequently by language instructors/teachers. Using digital and online language teaching materials (at least as a supplement to classroom instruction) should be enlarged to other courses and levels of proficiency. It seems necessary for materials developers and language instructors to consider the usefulness of digital language teaching materials more than before and invest more in designing and applying such online instructional materials.

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