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Teachers' Technology Integration Into English Instructions: SAMR Model

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Abstract – Technology integration has been acknowledged to support instructional activities in and outside classrooms. In English instruction context, previous researchers revealed that technology use contributes to the enhancement and longer retention of students' learning. This study is aimed at exploring kinds of technology to facilitate learning and evaluating how teachers integrate the technology into English instructions. Substitution Augmentation Modification Redefinition (SAMR) model by Puentedura (2006, 2013) was used as the framework to evaluate technology integration. Two English teachers of senior high schools in Central Java, Indonesia and their respected students were involved in this study. Classroom observation, interview, questionnaire, and document review were used to obtain the research data. This case study employed Thematic Analysis by Braun and Clarke (2006) as the data analysis method. The findings show that the teachers and students have utilized various types of technology and its integration has undergone four levels of Substitution, Augmentation, Modification, and Redefinition.

Keywords: *technology, integration, English instructions, SAMR model*

I. INTRODUCTION

Technology has been extensively utilized in educational context and proved to contribute to the enhancement of language instructions [1, 2, 3] and other fields of study [4, 5, 6, 7, 8]. Integration of technology can be realized in the planning stage of the instruction through syllabus which later is translated into the implementation and assessment practices. Along with this phenomenon, some scholars have carried out studies on exploring the framework for technology integration [9], and developing an instrument to examine Technological Pedagogical Content Knowledge (TPACK) [10]. Besides, other researchers focused their attention on the assessment of technology integration employing TPACK and Substitution Augmentation Modification Redefinition (SAMR) model [11], and the impact of technology integration professional development (TIPD) [4].

Technology integration into instructional activities needs to be evaluated in order to encourage teachers to outstandingly improve learning with technology support [11]. Besides, it provides a framework to categorize and examine M-Learning activities [12] so that it can be basis for future

teacher professional development. In the context of English instructional activities, a great number of researches focused on exploring the utilization of particular types of technology. For examples, a study was carried out to explore the integration of Web 2.0 tools to develop undergraduate students' communication skill [13]. Another research investigated the use of iPads and factors affecting teachers' TPACK adopting SAMR model [10]. Next, the study on the use of cell phone revealed that it was effective to evaluate university students' speaking skill [3]. A research on the empowerment of Mobile Assisted Social E-Learning and Web 3.0 technologies was claimed to enhance university students' collaboration and learning motivation [14]. Meanwhile, in Indonesian context, researches on technology focused on, to name a few, teachers' attitudes towards technology use [15], integration of Edmodo into Genre-based Approach to teach writing [16], and use of internet for various academic purposes [17].

Those aforementioned studies focused on the development of technology integration framework and its utilization mostly in college levels as well as teachers' attitude towards technology use and its impact on learning. However, studies on high school teachers integrating various technologies in their English instructions in Indonesian context remain under explored. To fill this gap, the present study was aimed at exploring types of technology the teachers integrated into their English instructions and how the integration was realized. To translate the purposes, SAMR model [11] was employed as the framework of the study. In 2006, Puentedura [11] developed SAMR Model which contains of Substitution, Augmentation, Modification, and Redefinition. The model is a four-level approach for selecting, using, and evaluating technology in K-12 settings. Then, in 2013 Puentedura [18] categorized the Substitution and Augmentation levels into Enhancement and the Modification and Redefinition levels into Transformation.

SAMR model was developed to examine how technology is infused into teaching and learning activities. Besides, it is to stimulate teachers to optimize instructional activities by using technology. Figure 1 below presents SMAR model by Puentedura (2006, 2013) [11, 18].

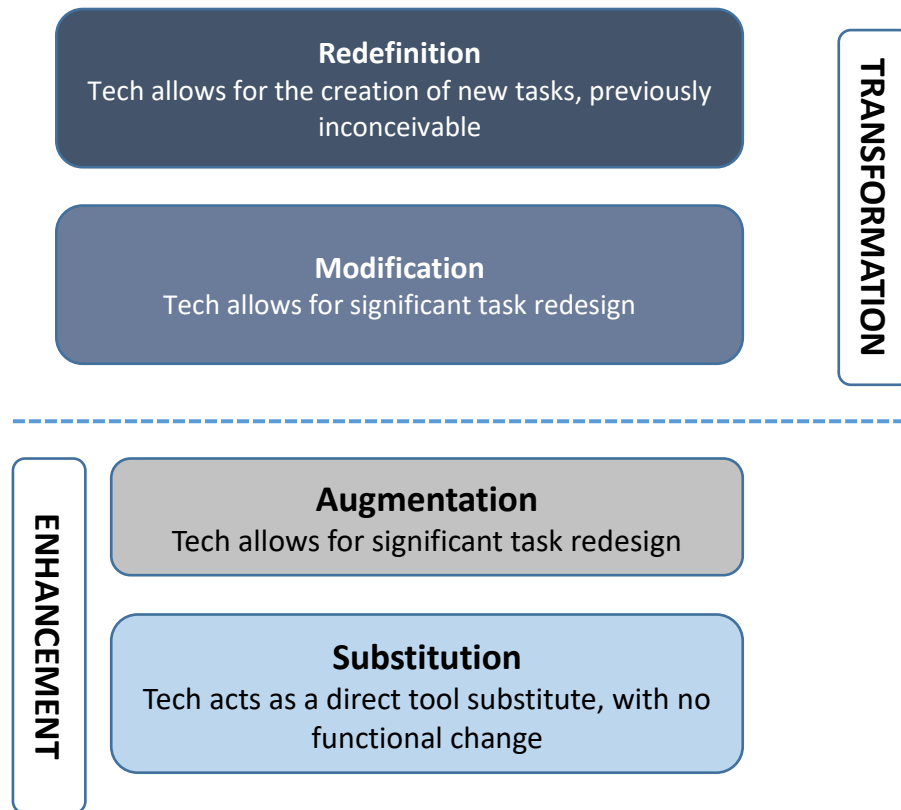


Figure 1. SAMR Model (Puentedura, 2006, 2013)

II. METHOD

The present study adopted qualitative descriptive research with a case study design to explore teachers’ technology integration into English instructions. Two English teachers of senior high schools in Central Java, Indonesia and their respected 54 students were recruited to involve in this study. Observation, interview, questionnaire, and document review intended to gather research data. To identify the pattern of the data occurrences, Thematic Analysis [19] was adopted as the method of analysing data.

III. RESULTS AND DISCUSSION

This section presents and discusses results of the data analysis. It covers types of technology infused into English instructions and how the technology was integrated.

3.1 Types of Technology Utilized in English Instructions

Research data gained through document reviews, observations, and questionnaires confirmed that the teachers have utilized various types of technology to facilitate English language teaching and learning. Table 1 below displays more detail information.

Table 1. Types of technology utilized in English instructions

Technology	Teachers	Students
Devices	Computer, laptop, cell phones, LCD, tablets	Computer, laptop, cell phones, LCD, tablets
Learning Platform	Edmodo, Google Classroom	Edmodo, Google Classroom
Learning Applications	Google Drive, Google Form, Google Slides, Google Docs, Quizzed, Kine Master (Video Editor)	Google Drive, Google Form, Google Slides, Google Docs, Quizzed, Kine Master (Video Editor), E-Dictionary, Google Translate, Games, TED, Word Pad, Online Learning Class
Learning Media	PPT, Multimedia (visuals, audio, video), Films, Songs	PPT, Multimedia (visuals, audio, video), Films, Songs
Social Networking Sites	WhatsApp, Youtube, Email	WhatsApp, Youtube, Email, Line, Instagram, Twitter
Others	The Internet	The Internet

Table 1 shows that the teachers have utilized various technology to facilitate classroom activities. Similarly, the students have also made use of technology to enhance their own learning. In terms of the devices, the teachers used laptops, LCD projectors, smart phone, and tablets. They utilized laptops to store, process data and as a device to access teaching materials and learning media. LCD projectors were available in every class to help teachers present learning materials. Both teachers and students had smart phones that they used to communicate, gain information, and deliver assessment. Besides using smart phones, the teachers also utilized tablets to search for information and facilitate teaching activities.

In addition to the use of technology devices, both teachers and students were familiar with employing Edmodo and Google Classroom as the learning platform. Edmodo is a social media network designed by O'Hara and Borg in 2008 [20]. This is an online learning platform which can be reached on <http://edmodo.com> [21]. The system provided the teachers a room for storing learning materials, media, tasks, and assignments. Besides, they also administered learning assessment through the system. Use of the platform gave benefits to the teachers and students in a way that it was practical for storing information which was ubiquitously accessible.

Other types of technology found to be used by the teachers and students were categorized into learning applications, learning media, social networking sites, and other. Learning applications include Google Drive, Google Form, Google Slides, Google Docs, Quizzes, Kine Master (Video Editor), E-Dictionary, Google Translate, Games, TED, Word Pad, and Online Learning Class (Virtual class provided by the government).

The teachers made use of the applications such as Google Drive, Google Slides, Google Docs as interactive and collaborative resources. Meaning that through the application, students can do collaborative work. They were assigned to complete a project work designing a biography text using Google Apps. Meanwhile, Google Form and Quizzes were used as media for designing and delivering formative tests. On the students' side, when completing the tasks and assignments they explored more information and learning materials through E-Dictionary, Google Translate, TED Talk, and Virtual Class. Games and Word Pad were other types of technology which the students could explore for self-learning.

Moreover, from the above mentioned technologies, social networking sites including WhatsApp, Youtube, Email, Line, Instagram, Twitter were the most popular amongst the research participants. It is likely that students used more types of social media compared to those of the teachers. However, besides for socializing, the teachers and students also used the media for learning purposes, for examples, posting important announcement, sharing files, and gaining learning materials.

Last but not least, the Internet connection was the one which must be present if technology had to be integrated. Based on the interview addressed to both teachers and students, they made use of their personal Internet connection which they could access through mobile phones. This was due to the fact that the Internet connection provided by the schools was not sufficient for all school members.

In regard to the focus of the present research aiming to evaluate technology integration into English instruction, SAMR Model by Puentedura (2006, 2013) [11, 18] was employed as the framework of the study. The result of the investigation can be presented in Table 2 below.

3.2 Integration of Technology into English Instructions

Table 2. Teachers and Students' Technology Integration – SAMR Model

Class Activities	Substitution	Augmentation	Modification	Redefinition
Roll Call	Cell Phone			
Recording tool		Cell Phone Camera		
Presentation	PPT			
File Sharing	Email, WhatsApp, Instagram, Line, Google Drive	Edmodo, Google Classroom, Google Drive, Google Docs, Google Slides	Edmodo, Google Classroom	Edmodo, Google Classroom
Speaking		Cell Phone Camera	Edmodo, Google Classroom	Edmodo, Google Classroom
Listening	Multimedia (Audio-Video), TED, Films, Songs			
Reading	Word Files, PDF Files			
Writing	Google Drive, Google Slides, Google Docs	Google Drive, Google Slides, Google Docs	Google Drive, Google Slides, Google Docs	Google Drive, Google Slides, Google Docs, Edmodo, Google Classroom
Assessment	Edmodo, Google Classroom, Quizzes, Google Form, Kahoot	Edmodo, Google Classroom		

SAMR Model was developed to motivate teachers to make remarkable changes on education translated via technology [11,18]. Based on the result presented in Table 2 and referring to the framework, the teachers' technology integration has undergone all four levels including Substitution, Augmentation, Modification, and Redefinition. The following sections explain the integration of technology categorized into each of the SAMR levels

Substitution

Substitution level refers to technology use to substitute other learning activities without functional change. It could be seen from the teachers' activities, for example, online checking attendance instead of paper-based attendance list. Next, the teachers' use of Power Point slides to present learning materials to substitute white board presentation. Use of Email, WhatsApp, Instagram, and Google Drive for file sharing media and an activity of reading PDF files or Word files has replaced the use of paper-based handouts. The students did a writing task of a descriptive text using Google docs. The teachers' use of Edmodo, Quizzes, Google Forms to administer quizzes and formative tests. This technology integration has substituted the use of paper.

Augmentation

Augmentation refers to technology use to replace other learning activities but with additional functions. The infusion of technology into teaching and learning activities performed by the teachers has undergone this augmentation level. For examples, the teachers embedded media including pictures, graphs, audio and/or videos into the presentation to gain students' attention and enhance learning. Use of Google Docs and Google Slides to facilitate students' collaborative work of a project of designing a biography. In addition, the teachers used Edmodo, Google Classroom, Google Drive, Google Docs, Google Slides to share files, information, tasks, assignments, quizzes, formative tests, final test with time restrictions. The students also used their cell phone camera to photograph and record their speaking activity of transactional conversations. After the recording activity, they might do some editing by using Kine Master video editor before they finally posted it on Google Classroom. This task aimed to enhance students' confidence and creativity. This is in line with the previous researcher showing that the creation of such videos using cell phone camera could enhance English learners' confidence and conversing speed [3]

Modification

Modification refers to technology use to redesign learning activities. The modification level could be seen in the teachers' adoption of the learning management system such as Google Classroom and Edmodo for posting questions and discussions. This

activity allows teachers and students not only to interact but also to solve problems. Another learning activity of using technology to enhance learning which fell into modification level was that students worked collaboratively completing a biography text. The biography could be in the form of books, comics, documentaries, and movies. To complete the tasks, the students needed technology tools such as cell phone camera to take pictures and record interview process; laptops to process the data; Google Docs to collaboratively write a text; and Google Slides to collaboratively design the presentation as well as an LCD projector to present the project work. They also utilized another application such as Kine Master to edit their movies. This is complementary to the previous study applying eMASE (Mobile Assisted Social e-Learning) for a conversation class [15].

Redefinition

Redefinition refers to technology use for the creation of tasks. The presence of technology is a must and could not be replaced by other tools. Classroom activities undergoing the use of technology which fell into redefinition level are speaking and writing. The students completed the project work such as making a video of transactional conversation, designing a biography text in the form movies and posted them on Google Classroom and Edmodo. Without these learning platforms, the students would not be able to demonstrate their creation and creativity. Besides, the teachers and students used various Google applications including Google Docs and Google Slides to create various multimedia elements to demonstrate learning. It also allows peers to comment on their friends' work and this encourages critical thinking. Google applications also enable students to create, collaborate on a project work, and share it to their teachers and friends for the feedback and comment.

IV. CONCLUSIONS

To summarize, both teachers and students have infused varied types of technology into instructional activities. In addition, its technology integration has undertaken the Enhancement (Substitution and Augmentation) and Transformation (Modification and Redefinition) stages. It implies that use of technology which falls into Modification and Redefinition levels enables teachers to transform learning to the students. In addition, on the part of the students, it can be inferred that use of technology may widen students' knowledge and skills of English. Besides, technology integration could encourage students to be more creative and be autonomous learners. With the aforementioned contribution, the result of the present study could be a reference for those interested in the similar field of study both at national and global context. Finally, use of technology is expected to enhance students' learning

and teachers' effective teaching. Yet, this is the limitation of the present study. Further research might be directed to explore the contribution of the technology to students' meaningful learning and teachers' effective teaching.

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