Mapping Indonesian EFL Teachers' Perception and Practice of Technology Integration

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Abstract

The growing number of 2.0 studies indicated the increasing tendency to integrate technology into EFL teaching. Reports on teachers' perception of and practice of technology integration can easily be found in research databases. Nevertheless, quite a few laid attempts to map and build a tentative connection between perception and practice. This study examined teachers' current practice and their perception of technology integration. The respondents of this study were 40 English teachers from 20 senior high schools in a district in Indonesia. To collect the data, a technology integration questionnaire (TIQ) was developed based on pre-existing instruments. The responses were analyzed using both quantitative and qualitative strategies. The study found that, first, the teachers commonly held positive views on the use of technology although they also indicated their alert on the challenges and requirements for the success of the implementation. Second, the responses suggested that there was a connection between teachers' perception and their technology integration practice. Third, viewed from the SAMR model, the teachers' technology integration practice mainly fell into substitution and augmentation. Categorization of the technology integration purpose, practice, and process is discussed further. The study concludes teachers' practice tended to focus more on the technology but less on the teaching and learning.
Keywords: EFL teaching; SAMR; teacher perception; technology integration

INTRODUCTION
Technology has become a buzzword in 21st-century education. Research databases have recorded an increasing number of studies focusing on the use of technology in the teaching and learning process. To name some of the most recent, Hartman et al. (2019) investigated the teachers' perception of technology integration. Francom (2019) studied the barriers to technology integration while Khlaif et al. (2019) look into how teacher design activities that integrate technology in their teaching.

Although themes such as teachers' perspectives on technology integration have been explored (e.g. Hartman et al., 2019 and Halvorsen, 2020), it is always interesting to examine how the perceived views about technology are reflected in the practice. Theoretically and empirically teachers' beliefs lead their practice, however, Chen (2008) found that there was an inconsistency between

teachers' expressed belief and their practice of technology integration. This finding is quite the opposite of Ertmer et al. (2012) who assert that teachers' belief is the major factor that influenced their practice. This study sits in the unresolved discussion of teachers' perspectives and practices of technology integration. Utilizing a questionnaire, this study collected data on teacher's perception of the use of technology and elicit their current practice of teaching to see if there is a potential dialogue between their view on ed-tech and their actual classroom practice.

Technology in the classroom: trends and issues
Since its early use in EFL classrooms, support and criticism on technology integration have been around and the debate is inconclusive. One central issue in technology integration is whether it transforms instructional practice. Briefly, at least two kinds of

transformations can be drawn from recent studies in the area. First, technology transforms the role of the teacher. Increased access to information as a result of technology has lessened the dependency of students in obtaining content. The teacher role thus shifted from content or material provider to facilitator (Glasset & Schrum, 2009; McKnight, 2016). Second, technology transforms teaching/learning routines. For students, the open access to content at the same time bring them to the new learning routines. Learning changes from memorization to active inquiry (Glasset & Schrum, 2009). For teachers, at the very least, technology offers efficiency in doing their tasks that traditionally were time-consuming, e.g. checking and grading homework. As such teachers have more time to focus on other important tasks such as planning instructions (McKnight et al., 2016). Furthermore, technology changes how teachers enact the curriculum; in other words, it changes how the teacher teaches the lesson (Levin & Schrum, 2013). McKnight et al. (2016) found that the open accessibility aided by the use of technology leads to the possibility to tailor the lesson in a more personalized manner.

The very idea that technology transforms teaching and learning, however, has been a subject of criticism from its early years to date. Hennessy et al. (2005) for example has placed caution by citing several findings on ICT implementation which mentioned that teachers do not change the way they teach although technology is used. The available technology is either underused or poorly integrated into the classroom. Likewise, Livingstone (2012, p.9) doubts the transformation by saying "schools proving slower to change their lesson plans than they were to fit computers in". Livingston forwarded different, if not opposing, research findings on learning improvement as a result of technology integration. She eventually questions the benefits of technology for teaching/ learning by pointing out that the evidence on learning improvement remains 'elusive'.

The concern with the 'transformation' issue of technology integration invites scholars to provide and/or suggest models for technology integration. Wang (2018) comes with the generic model that consists of interactive components of pedagogy, social interaction, and technology which is claimed to fit well within the constructivist learning theory (both cognitive and social), interactivity design, and the definition of the usefulness of a system. Meanwhile, a critical work on mobile learning by Kearney et al. (2012) results in the proposal of the iPAC framework. This framework consists of three key constructs in technology integration, particularly mobile learning: Personalisation, Authenticity, and Collaboration which are further broken down into seven operational sub-contracts. Two other approaches to technology integration that receives growing attention are TPACK (Mishra and Koehler, 2006) and SAMR (Puentedura, 2014). TPACK offers a unifying framework that consists of Technology, Pedagogy, and Content Knowledge.

TPACK is depicted as circular in nature with an overlapping area in the center. While the SAMR is often viewed as a framework for technology integration (Hilton, 2016), it somewhat differs from the previous models because SAMR can also be used to depict the integration process (or, debatably, level) and compared to the other framework, it tends to be more practical than theoretical. This model will be further addressed in the next section.

Regardless of the opposing views on technology integration, and the continuous search for effective integration, it does not change the fact that technology will continue to affect all aspects of human life including EFL classrooms. Boosted with support from the policymakers, rich-tech classrooms will likely to be the normal environment of EFL teaching/ learning in the coming years. Needless to say, reflecting on previous studies by Hennessy et al. (2005), Livingston (2012), McKnight (2016), Kearney et al. (2012) and Wang (2018) which have examined several aspects of technology integration e.g. teachers perspective, the process of integration, expected transformation, and working model for effective technology integration, further explorations on the issue are required due to the complexity of the context of technology integration in the classroom and the inconclusive findings of previous studies.

SAMR Model of Technology Integration

SAMR model is often illustrated as levels or sequences that begin with the Substitution, Augmentation, Modification, and Redefinition (Puentedura, 2014a).
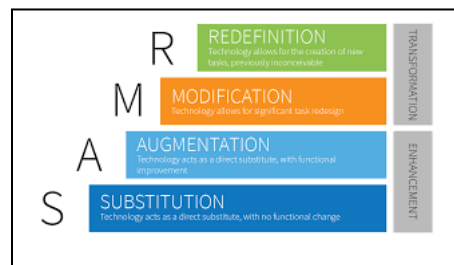

Figure 1. The SAMR Model
(https://www.schoology.com/blog/samr-model-practical-guide-edtech-integration)

In the 'Substitution' technology acts as a direct tool to substitute with no functional change. Moving to 'Augmentation', technology acts as a direct tool substitute, with functional improvement. At the 'Modification' technology allows for significant task redesign and at the 'Redefinition', technology allows for the creation of new tasks, previously inconceivable. The first two 'stages' i.e. the Substitution and Augmentation serves as the Enhancement of the traditional practice while the last two i.e. Modification and Redefinition defines the transformation of the practice.

This model is commonly viewed as a pathway and is sequential but it is also viewed as spectrum or

continuum. Floris and Renandya (2019) view the SAMR as the "path by which technology can be systematically embedded in teachers' instructional practices" (p. 55) The model invites teachers to aim for the transformation stage.

Despite its level-like depiction, it is important to ensure that technology that is integrated has a meaningful purpose. This means that the implementation of SAMR has to be nested in a certain instructional context. In a certain context, Substitution may be the best option. However, if the whole term is filled with digitizing sources/ activities without a purposeful enhancement or transformation then, likely, the technology integration is not for the sake of instruction.

As a systematic approach, SAMR offers ease of use for teachers. Examining the use of both TPACK and SAMR, Hilton (2016) revealed that teachers found the later easier and simpler to implement. Nevertheless, SAMR's simplicity is also a subject of criticism. Hamilton et al. (2016) viewed the model as overly simplified in capturing the complex nature of technology integration in the classrooms. In particular, they pointed at the absence of context, rigid structure, and focus on product over process. While some points of the criticism are on point, SAMR still holds some potentials to guide teachers to integrate technology in their classrooms.

Although the number of studies on SAMR is limited, an attempt to exemplify its use in the EFL classroom has been made by Floris and Renandya (2019). They provide four hands-on scenarios for the transformation stage. The original task of writing and speaking is modified and redefined by infusing friendly and free applications such as *Bookcreator, Natural Reader*, and *Google Form*. The application does not only ease the completion of the task but also reaches a wider audience. This opens the opportunity for wider collaboration and peer interaction which from the constructivist point of view leads to learning.

In this study, the SAMR model is used to frame the investigation of teachers' current practice of technology. This model is selected because of its simplicity and clarity of the leveling as indicated in the study by Hilton (2016). The study aims at finding out in what stage the current practice of technology integration sits. This study also investigates if there is a possible connection between their current practice and their perception on technology integration.

METHOD
Participants
A population of senior high school English teachers from all schools in a district in Central Java, Indonesia was invited to participate in this study via district English teacher association (MGMP). A Technology Integration Questionnaire (TIQ) was distributed through both e-mail and postal mail to all 50 teachers in the region. The online and offline distributions were required because some teachers were not familiar with technology and had no or

limited internet connection Out of 50, 10 teachers did not fill in the instrument; leaving 40 teachers (30 female and 10 male) as the actual respondents of the study. The teachers came from 20 different schools, both state and private. They all had been teaching at all levels, from grade 12 to 15. The respondents who completed the questionnaire had a heterogeneous background in terms of teaching experience and technology training as observed in Tables 1 and 2.

Table 1
Technology training

Technology training experience			
None	A full day or less	More than a day but less than 1 semester	More than 1 semester
30 %	**33%**	**30%**	**7%**

Table 2
Teaching experience

Teaching experience (years) in percent							
0	1-5	6-10	11-15	16-20	21-25	26-30	>30
8.8	8.7	16.1	25.8	22.6	16.1	-	12.9

Data Collection and Instrumentation
The data were collected utilizing a questionnaire. The questionnaire was adapted from available pre-developed instruments on technology integration (TIQ) in education. The questionnaire is divided into five main sections. Four sections present close-ended questions and one section at the end of the instrument presents open-ended questions. The first section consists of 27 questions eliciting the respondents' professional views on technology (e.g. if technology aids learning). The second section consists of four questions to capture the teacher's background, preferred teaching style, and available resources. The third section gathers information on the teachers' experience with technology. The fourth section collects information on the teacher's process of integration. Finally, the fifth part captures the teacher's short description of their current practice (open-ended). All questions were uploaded and shared online. Before distribution, face validity was established by having the items reviewed in terms of the content/ coverage and readability. A pilot survey was also carried out to a group of senior high school teachers in different districts. The problematic items were revised afterward.

Data Analysis
The collected data were tabulated and analyzed quantitatively to obtain a 'readable' data display. The data obtained from online and offline questionnaires were extracted and transformed into figures and tables. The data displayed were then interpreted qualitatively. The process began by sorting display for each group of information (referring to the sections of the

questionnaire). In each group, modus and peculiarity were located or identified. Theme or category was then developed, and interpretation was made based on the pattern of information that emerged from the obtained data. To enhance reliability, data were triangulated by conducting a focus group interview.

RESULTS AND DISCUSSION
### Teachers' Professional View on the Use of Technology
In this study, the teachers' perspective refers to what teachers think of the technology integration (TI); their particular attitude or way of regarding TI, either positive or negative, regardless of the theoretical or empirical considerations. The questionnaire revealed that teachers generally hold a positive perspective on the use of technology. The positive views can be categorized into three areas: students' improvement, instructional benefit, and perceived professional competence.

1. Students improvement
Data from the questionnaire revealed that the students' improvement which was perceived by the teachers to have been driven by the use of technology in the classroom covers academic achievement, collaboration, communication skills, interpersonal skills, and the learning of critical concepts/ ideas. Further, the interview bared that the teachers think TI helps students to learn better because it allows students to learn at any time and opens access to various learning materials, thus lead to better academic achievement. TI also helps students to communicate and collaborate either with their classmates or students from different classes even different parts of the world. The larger network opens the opportunity for developing communication and cooperation among students. The data also revealed that teachers view TI as an aid to develop students' critical thinking. They argued that technology provides more materials/ information for students and it means that the students have to select, synthesize, and evaluate the content which all required higher-order and critical thinking.

Figure 1
*Teachers' perspective of TI on students' improvement*
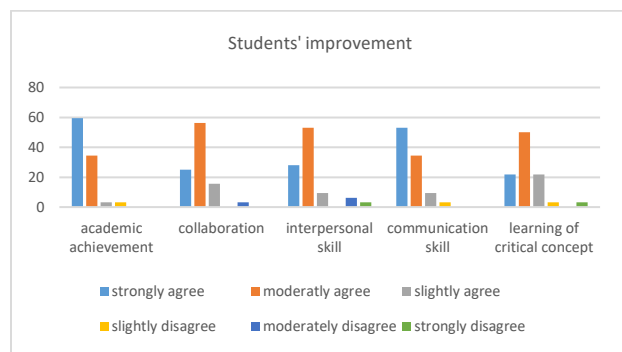
These positive perspectives on TI have been an area of interest for researchers to empirically prove them. While results are still inconclusive (Livingston, 2012; Unser, 2017), theoretically, when technology allows students and teachers to connect to a wider audience (e.g. through a forum or blog post) and when it allows collaborative construction of text (e.g. through Google docs), new demands on the collaboration skill and communication skill will emerge and develop. Learning through the world-wide-web allows students to be exposed to multiple-perspective thus help them to increase their criticality.

2. Instructional benefits
Most teachers in this study agreed that the use of technology in their instruction is not a burden for their instruction. They think that integrating technology will not make classroom management difficult. This study found that the teachers perceived TI is beneficial for their instruction.

Figure 2
Teachers' perspective of TI on instructional benefits
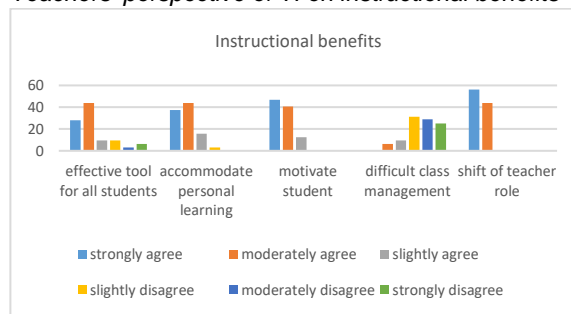
There are three major benefits that the teachers perceived from the integration of technology into instructions. (1) Technology motivates students to involve in the learning activities. The authenticity of material and tasks offered by the use of technology potentially elevates the students' motivation to engage in the learning activities. Besides, novel and continuous improvement/ interactivity of education application, for example, serves as the trigger of students' interest and curiosity which is vital in learning. (2) Technology accommodates personal learning. This finding resounds Kearney et al. (2012) who noted that personalization is the prominent feature that technology offers to teachers. This element of personalization is particularly advantageous for teachers teaching a mixed ability class. A well-tailored lesson allows students to learn at their own pace and their comfort zone of learning (style). Technology has the required buttons to make this personalization possible. (McKnight, 2016). (3) Technology encourages shifts in teachers' roles. Accessibility which has been viewed as an element of technology integration brings about this transformation. As the students have more access to content, the teacher

role shifts from a content provider to facilitator and learning become more student-centered.

   3.   *Perceived professional competence,*
        challenges, and threats

The data indicate that 69 percent of the respondent think using technology lessen the teachers' pressure in doing their work and respondents agree at a varying degree that using technology makes them feel more competent. An interview with the teachers revealed that as the use of technology in teaching has become a preferred practice in recent years, teachers feel that the ability to use technology as a required competence for them. It means, when they can utilize the technology, they considered themselves as competent teachers and vice versa. This common view is emphasized by respondent EW:

> *Today that everyone is talking and using these modern tools, computers, apps and stuffs, I personally think that they are so cool. I mean, that's like a new definition of a teacher today. A teacher who is struggling or do not or cannot use technology, like myself, are often considered as not competent. I mean, unlike my friends who can explore new media and materials, I feel that I'm so left behind.*

At the same time, the questionnaire respondents regard technology as a means to enhance their professional development. In the interview, they clarified that through technology they learn new things about their subject knowledge. They also found learning to use the technology itself is part of their effort to develop their professionalism as highlighted by teacher WS:

> *"I like joining trainings and workshops on technology because I think.. that is now a demand and I belief such training is highly beneficial for my career. My friends are using great apps in their classes and if I can't use tech like my friends do, my class will be like the worst among other classes. If I can use technology my teaching will get better, I can create online quizzes or videos or other projects that the students like. My class will not be boring again"*

The interview excerpt also suggests that there is a social element that affects the teacher's attempt to develop their professionalism through the use of technology. The teacher use technology because other teachers around him/ her are using it. Unser (2017,p.38) also found a similar phenomenon: "Teachers are influenced by social norms attached to the use of technology in their schools and respective school environments."

While the teachers commonly view the use of technology positively, they also feel a certain degree of threat to their professional work. The data indicates that 35 percent of the respondents worry that the use of technology will reduce the number of teacher demand in the future.

Surprisingly also, 44 percent of the questionnaire respondents think that their choice of material will be limited. The teachers are aware that with the aid of technology, the materials are not only easily accessible but also abundant. Yet, the ease of access for the students and the largely and traditionally held role of teachers as content providers made them think that technology reduces their authority in terms of material provision. This explains how 44 percent of the respondents also think that the use of technology in the classroom is difficult because some students know more about computer technology than many teachers do. Aside from the threats, the respondents acknowledge the challenges of technology integration.

Figure 3
Challenges of technology integration
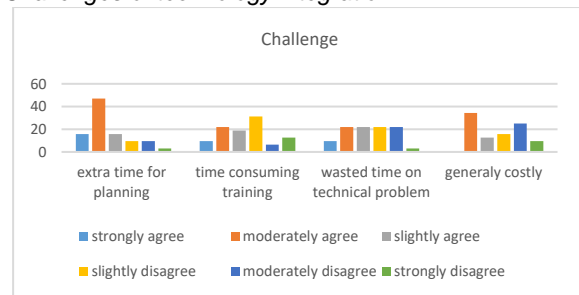
As indicated in figure 3, the respondents hold different views on the challenges of technology integration. However, the near split-half proportion of those who agree and disagree on given statements indicated the teachers' concern on the issue. Similar problems were also identified in the study by Ramorola (2015) which revealed that major challenges affecting the integration of technology included insufficient technology, lack of teacher qualification to integrate technology, and technical issue related to integration and maintenance.

These findings suggest that there are requirements for effective technology integration in classroom instruction. The questionnaire reveals four main prerequisites: adequate training, stand-by/ on-demand technical support staff, teachers' agency (involvement of teacher, self-efficacy), and parents and home environment support.

Figure 4
Requirements
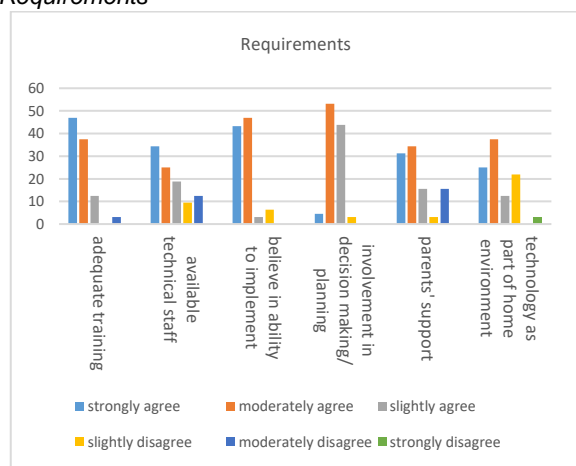
Two of the identified requirements i.e. training and available technical support confirmed findings of the previous study by Romorola (2015). It is interesting to note that the teachers highly value their agency in using technology in the classroom as a success element.

The Teachers' Process and Current Practice of Technology Integration
The examination of teachers' process of technology integration begins by mapping the length of training that they have for the integration of technology into teaching. The data obtained revealed that only 6.5 percent of the respondent received full semester training and nearly 30 percent have not received any training. The rest mentioned that they have received either less than a day or less than a semester-long training. (See table 1). The data are confirmed by the teachers' self-description on the proficiency level they have in technology. The majority of the questionnaire respondents consider themselves as being at the average and beginner category. This means that they either have attempted to use technology but still need help or have the basic ability to use certain applications/tools/ software.

Table 3
Perceived technology proficiency

Unf-ami-liar	New-comer	Begin-ner	Aver-age	Advan-ced	Expert
0	12.5%	15.6%	59.4%	9.4%	3.6 %

Regardless of the minimum amount of formal training and their perceived technology proficiency, the questionnaire responses revealed that the teachers are quite positive in describing their process of technology

integration in their teaching. Different finding, however, was reported by Unser (2017). She found that the amount of training for classroom teachers and the teachers' self-efficacy in using technology are two crucial factors that determine teachers' technology integration practice. She noted that teachers are reluctant to use technology if they think that they have not enough training and skills to use it in the classrooms.

Table 4
Self-description of the technology integration process (self-efficacy)

|	
I am aware that technology exists but I have not used it – perhaps I'm even reluctant to use it.	3%
I am currently trying to learn basic tools and application	21.9%
I am beginning to understand the process of using technology	31.3%
I am gaining self-confidence in using technology	34.4%
I can apply what I know about technology in the classroom	9.4%

As indicated in table 4, 87.7 percent of the teachers describe themselves as either beginning to use or gaining confidence in using technology in their instruction and only 3 percent are reluctant to use technology in their teaching.

Unser (2017) found that self-efficacy is one factor that determines whether or not teachers are going to use technology. Her study revealed that "many teachers believed that they were not properly prepared to use the [technological] devices, let alone to teach their students to use them" (p.39). These teachers tend to not use technology due to low self-efficacy. In this study, however, responses to the questionnaire bared a different finding. While some teachers admitted that they did not receive any training on using technology, a high percentage of teachers state that they are willing to use technology in their teaching.

The relatively high self-efficacy on the use of technology is mirrored in the frequency of technology integration practice. As many as 20 tech-related activities which can be categorized into 7 purposes (instructional, evaluation, recreational, expressive, creative, communicative, and informative) are used to describe the current practice of technology integration.
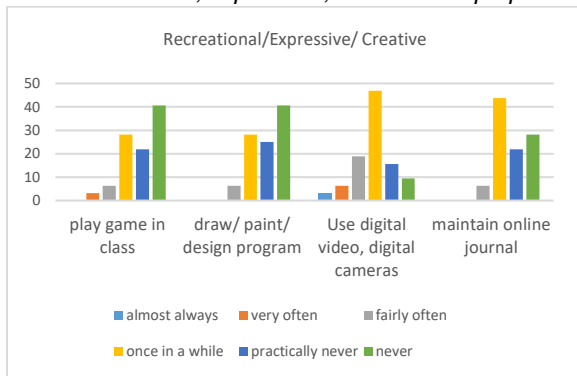
Figure 5
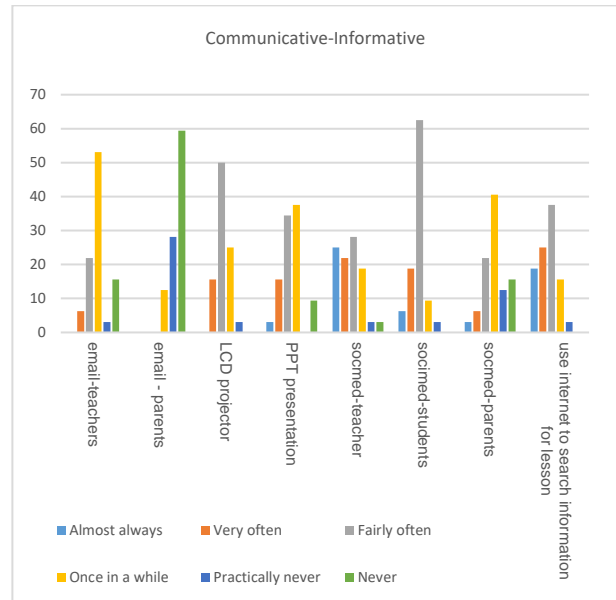TI for instructional and evaluation purposes
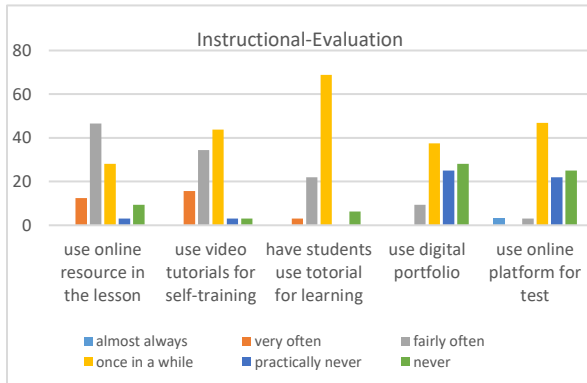
Figure 6
TI for organizational processes
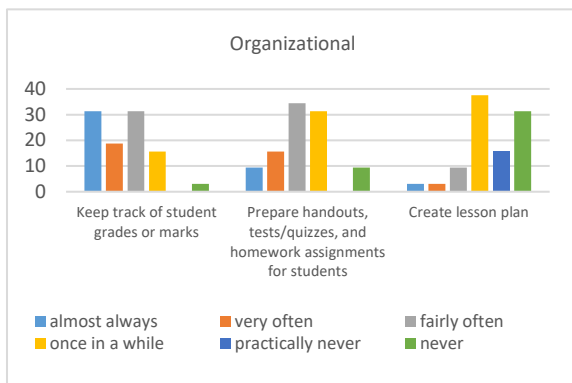
Figure 7
*TI for recreational, expressive, and creative purposes*

Figure 8
TI for communicative-informative purposes

The data show the varying degrees of the frequency of using technology in the eight categories of purposes. Top five activities that reflect the integration of technology include: (a) using an online resource for learning, (b) keeping track of students' grades, (c) preparing handouts/ tests/ quizzes/ homework, (d) searching the internet to search for information for the lesson, and (e) using social media to communicate with the students. These activities, however, indicate very basic use of technology and yet to be said as purposefully designed to facilitate learning. Advanced and more meaningful activities are not explored i.e. creating a lesson plan, using an online test, and maintaining an online journal. Also, the frequency measure suggests that the teachers do not actively build connections to parents either through emails or social media platforms.

Viewed from the process, the teachers mainly acknowledge that their use of the technology is in the Substitution and Augmentation category.

Figure 9
Teachers' process of integration
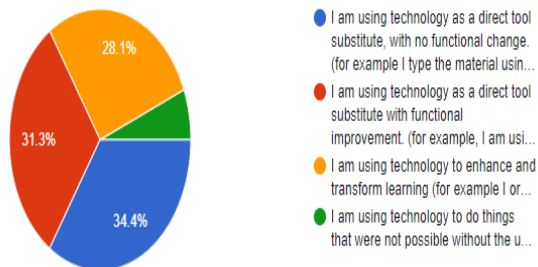
The respondent-teachers also reported examples of their teaching activities which they perceived as integrating technology. There are reports on the use of Kahoot, weblog, and YouTube project but one commonly reported activity includes using *PowerPoint* presentations in addition to using digital resources (book). This means that the reported sample activities justified the self-measurement/ evaluation.

The findings of this study are relatively problematic. While the teachers commonly hold positive views on TI and indicate an attempt to integrate technology into their work (regardless of theor formal training), the integration process was mainly at the level of Substitution and Augmentation. The two levels of integration may be viewed as less meaningful to learning. Puentedura (2014b) exemplified that switching hand to digital note as a good sample of Substitution; however, Oppenheimer and Muller (2014) mentioned that this substitution harms students learning. This confirms the previous criticisms and requirements on technology integration which were forwarded by Hennessy et al. (2005), Livingston (2012), and Unser (2017). They pointed out at least two issues related to TI in the classroom: (a) the poorly used of technology that it cannot lead to teaching transformation, (b) the teachers' use of technology in the classrooms is dependent on the continuous classroom teachers training and self-efficacy.

CONCLUSION
This study revealed that the positive views on technology may have driven teachers to use technology. However, there are some propositions on technology integration that can be drawn from the results of the study. First, teachers who are beginners or average users of technology tend to focus more on the use of technology and less on teaching. Second, technology integration does not make teaching and learning better. As shown in the findings, the teacher's current practice of technology integration was at the substitution and augmentation. This means that the integration has not been purposeful

or meaningful. The transformation effect of the integration for learning or teaching is yet to be achieved. This means the teachers' teaching does not undergo any change regardless of the use of technology. While the teaching tool or medium of instruction is changing, the change is a normal impact of technological advancement in all aspects of human life. Simply put, in the context of the non-advanced user, the only thing that develops is the technology being used but not the learning. It is therefore recommended that teachers should receive continuous training on technology to minimize their struggle with the fast advancement of technology but at the same time, teachers should be trained to frame the use of technology in the effort to optimize their teaching and learning.

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