ELT Echo : The Journal of English Language Teaching in Foreign Language Context

journal homepage: https://syekhnurjati.ac.id/jurnal/index.php/eltecho

EFL TEACHERS' TPACK AND THEIR ESPOUSED USE OF ICT BASED ON SAMR MODELS

Maulana Mualim[a]*, Fakhrezy Rizal Maulana[b]

[a,b]English Education Department UIN Saizu Purwokerto, Indonesia

Corresponding author: Purwekerto, Central Java, Email: maulanamualim@uinsaizu.ac.id

a r t i c l e   i n f o

a b s t r a c t

Information and Communication Technology (ICT) has been an inseparable part of human life. Its integration into education is very important. This study aims to describe the Technological Pedagogical Content Knowledge (TPACK) of English teachers in Banyumas Regency, their competence in using ICT based on the Substitution, Augmentation, Modification, and Redefinition (SAMR) model; and the influence of their TPACK to their ICT integration capabilities. This research applied a Mixed Method Research with explanatory sequential design. The respondents of the quantitative phase were 31 teachers while the informants of the qualitative phase were 4 teachers taken randomly. Quantitative data were collected through two questionnaires. Meanwhile, Qualitative data were collected through observations, interviews, and documentation. The quantitative data were analyzed using SPSS while the qualitative data were analyzed using the Miles & Huberman model including data reduction, data presentation, and conclusions. The results showed that the teachers' TPACK was in "good" category with an average score of 2.89 (in the range of $2,5 \leq x < 3,25$). Their ICT integration ability was in the category of "sufficient" with an average value of 2.12 $(1,75 \leq x < 2,5)$. The teachers' TPACK influences their ICT integration capabilities. The results shows that the value of the coefficient a is 13.067 and b is 0.609. Meanwhile, the regression equation is $Y = 13.067 + 0.609$. In the qualitative phase, teachers demonstrate the ability to use ICT that meets the criteria of Substitution (S), Augmentation (A), and Modification (M). The highest level of ability, Redefinition (R) was not seen.

INTRODUCTION

The role of Information and Communication Technology (ICT) in improving the quality of human life as one of the indicators of the development of the Industrial Revolution 4.0 era (henceforth, IR4) is increasingly sensed (Sawitri, 2019; Sukhodolov, 2019). Technological sophistications that previously existed only in the fictional world, have now been widely felt in the real world. Although technology cannot completely replace the role of teachers and learning techniques in schools, ICT accessibility can strengthen the learning process with the consequence of improving the quality of learning outputs (Levin & Wadmany, 2006; Suardi & Hamid, 2013). In line with that, learning methods and techniques (especially English lessons) have also developed as described by Suherdi (2015) that English language learning needs to be implemented with ICT so it goes in line with the socio-cultural changes of today's society, Ammade et al. (2018) and Fithri Al-Munawwarah (2014) who posit that the application of ICT can improve students experiences and learning outcomes, and Katemba (2020) and Mahdi (2013) as stating that most teachers are ready to integrate ICT in today's teaching by showing a positive perception about it. Therefore, English educators and learners need to integrate ICT

and learn its various functions to realize more effective and up-to-date learning styles and teaching techniques (El-Ghalayini & El-Khalili, 2012; Nugroho & Mutiaraningrum, 2020).

The Indonesian government has long been preparing Indonesian education to face the IR4 era by emphasizing 21st century learning and learning styles. Through the 2013 curriculum and the Merdeka Curriculum, the Indonesian government requires teachers to integrate ICT in their teaching sessions in order to improve the quality of students learning and prepare them to welcome the digital era and global communication (Mendikbud RI, 2013). However, the implementation of ICT into teaching in *Madrasah Aliyah* (henceforth, MA) still faces various problems, including lack of facilities, lack of teacher preparation, lack of time, and teachers' low competency in ICT. (Fithri Al-Munawwarah, 2014; Lubis, 2018; Mardiana, 2020; Nugroho & Mutiaraningrum, 2020).

Technological, Pedagogical, Content Knowledge (henceforth, TPACK), developed by (Koehler & Mishra, 2006), is a framework for adhering to for the competence of teachers in certain fields of study that are associated with technology. Meanwhile, to measure these abilities, the SAMR model can map teachers' abilities in four elevating categories, from the lowest category, substitution, to augmentation, modification and finally, redefinition. Both models are seen as good to attribute to the integration of ICT in learning (Hockly et al., 2014; Kihoza et al., 2016)

So far, research on the theme of the use of ICT in English language learning and its relation to the TPACK and SAMR models has shown results that TPACK and SAMR are two models that are feasible to use to see teacher competence in ICT integration. (Kihoza et al., 2016). TPACK and SAMR can improve teachers' ability to integrate ICT (Nair & Chuan, 2021). The SAMR model was used by Priyadi et al. (2021) to show that during the pandemic teachers in several middle and high schools in North Sumatra experienced an increase from the Substitution to Redefinition level. The SAMR model was also used by (Budiman et al., 2018) to measure the ability of English teachers at MA Assalam Sukoharjo in the use of ICT with the result that the teacher was at the level of Substitution and Augmentation. There were constraints associated with facilities and competencies to achieve a level of Modification and Redefinition.

Based on the description above, a study to describe teachers' TPACK, the extent to which teachers use ICT in learning, and whether or not TPACK affects the ICT use of Madrsah Aliyah teachers needs to be carried out.

Previous studies
Research on how ICT is used to improve the quality of teaching has been widely carried out. Some research that are seen relevant to this study are explained in the following section. Kihoza, Zlatnikova, Bada, and Kelegela examined how Tanzanian teachers use ICT in their learning based on the TPACK and SAMR models in 2016. The results show that most respondents had low literacy in using ICT, they had low knowledge in ICT for teaching, and they did not have a courage to change. Besides, the facility of the schools were found to be insufficient (Kihoza et al., 2016). Nena Restiana and Heni Pujiastuti in 2018 measured teachers' TPACK in a rural area. The results showed that the teachers' TK (Technological Knowledge) and TCK (Technological Content Knowledge) had an effect on TPACK. Restiana and Pujiastuti did not analyze how teachers perform in teaching using ICT, they focused on

factors affecting the emergence of TPACK from within the TPACK domains (Restiana & Pujiastuti, 2019). On the other hand, Asep Budiman, Rani Rahmawati, and Rizky Amalia Ulfa conducted a case study with the results showing that their teacher-respondents had a strong belief that the use of ICT is necessary in realizing the 21st century learning. Budiman et al. did not analyze the influence of teachers' TPACK on their ability to practice ICT integration in the classroom (Budiman et al., 2018). By looking at the previous studies, this research will investigate the TPACK of MA English teachers in Banyumas regency integrate and their ICT integration into their teaching. This research attempts to fill the research gaps of Kihoza et al. (2016) by researching the use of ICT in a developing country, of Restiana & Pujiastuti's (2019) research by looking at the effect of TPACK on ICT integration capabilities, and of Budiman's et al. (2018) research by taking more samples so that the results are more general.

ICT and Its Use for English Teaching

The need to use ICT in English language learning is increasingly felt when the characteristics of the Industrial Revolution 4.0 (IR4) era are increasingly felt. IR4 is characterized by the increasingly widespread use of ICT and the Internet of Things (IoT) to facilitate human life (Lasi et al., 2014; Sukhodolov, 2019). As a consequence, ICT and the Internet cannot be separated from English learning. Today's English learning is different from learning ten or twenty years ago. Nowadays, a lot of technology is used to facilitate the daily lives of students. The speed of accessing information, obtaining authentic material, communicating with people from different parts of the world must also be integrated in English learning activities so that the quality of learning can be improved. To achieve this, technological competencies must be well formed and owned by teachers (Cooperman, 2018; Yücel & Koçak, 2010). Technology competence is a series of technical knowledge of teachers on how to use electronic tools and applications that can improve the quality of their work (Antonio et al., 2020; Uerz et al., 2018). This knowledge is absolutely necessary for current English teaching activities.

English language teaching covers four skills that need tobe delivered in equitable manner. English teaching is not possible only by providing written materials since audio and video files play an important role in training listening and speaking skill (Kusuma, 2020). Therefore, using technology is necessary because technology could bring teaching materials and models into the classroom that could not be attained otherwise (Suhardiana, 2019). Inviting a native speaker to the classroom or taking students on a field trip to England is not a project that could be realized easily. The ICT is here to be a solution to keep English learning effective with authentic materials at an affordable cost.

Technological, Pedagogical, Content Knowledge (TPACK)

TPACK is a concept of knowledge that combines knowledge of the field of study and pedagogy combined with the skills of using technology (Schmidt et al., 2009a). This concept is a continuation of the Pedagogical Content Knowledge (PCK) construction introduced by Shulman where technology is located in the intersection between Technology, Pedagogy and Content. TPACK is considered a necessity because the use of ICT in human life is unavoidable, including in the world of education (Schmidt et al., 2009). There are seven components of knowledge that become one unit in realizing teaching using technology: 1) Technological

Knowledge (TK) refers to a person's knowledge of ways of operating certain technologies; 2) Content Knowledge (CK) is knowledge of a particular field of study; 3) Pedagogical Knowledge (PK) explains the procedures for delivering teaching including how to manage time and know the psychological condition of students; 4) Pedagogical Content Knowledge (PCK) refers to knowledge of procedures and techniques for delivering material in teaching; 5) Technological Content Knowledge (TCK) is knowledge about the relationship between a subject matter and technology; 6) Technological Pedagogical Knowledge (TPK) is knowledge of how certain technologies can help and improve the learning process; and 7) Technological Pedagogical Content Knowledge (TPACK) explains how technology with the improvement of educational knowledge could help deliver contents.
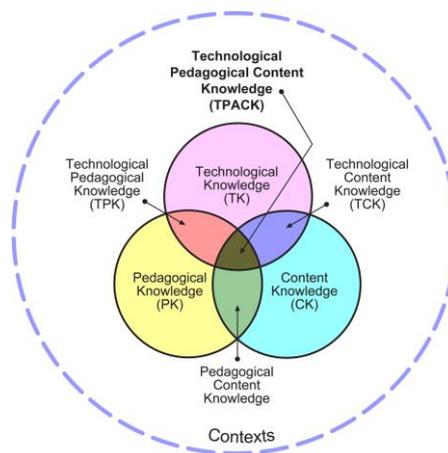

Figure 1. TPACK components

A teacher is considered to have a good TPACK if he is able to combine content knowledge, pedagogy, and technology in learning. The indicators are: 1. The teacher masters the subject matter, 2. The teacher masters how to convey the subject matter in various situations, 3. The teacher is able to manage the dynamics of the class, 4. The teacher is able to make summative and formative assessments, 5. The teacher is able to convey the material with a specific application, 6. The teacher can invite students to understand the material with certain technologies, 7. Teachers can assess the results of students' work using certain technologies (Koehler & Mishra, 2006).

SAMR Model as A Framework of Digital Pedagogy

The SAMR model, which stands for Substitution, Augmentation, Modification, and Redefinition, is an analytical instrument developed by Puentedura (2006) to measure the levels of technology integration abilities in teaching. SAMR can be used as a method to see progress in the use of technology in learning and its impact (Budiman et al., 2018; Hockly et al., 2014). At the Substitution level, technology is used to replace learning media without any change in the material. The Augmentation is a level where teachers make minor modifications to the material to be in line with the function of technology. The Modification level when the use of technology demands significant material changes. Finally, the Redefinition is the level where technology results in the creation of entirely new material. The substitution and augmentation stages are seen as enhancement level while the modification and redefinition stages are categorized as transformation level (Budiman et al., 2018; R. Puentedura, 2006). The SAMR

model is often associated with Bloom's Taxonomy because it equally measures the abilities of teachers from simple to complex levels.
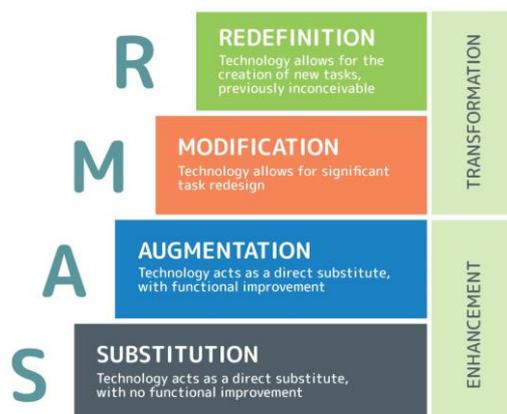

Figure 2. SAMR (substitution, augmentation, modification, dan redefinition) model

METHOD

This study applied a Mixed Method Research (MMR) with a sequential explanatory design. The authors used a multiphase design in which quantitative and qualitative research are aligned sequentially, consisting of one quantitative phase and one qualitative phase that supports and supplements the quantitative phase. This research was conducted in the regency of Banyumas for six months from February to August 2022. Respondents of the quantitative phase were 31 EFL teachers (total sampling) from 19 *Madrasah Aliyah* (both state and private *madrasah*) in the Regency of Banyumas while the informants of the qualitative phase were five teachers selected randomly from the quantitative phase respondents.

Two questionnaires were developed to collect the quantitative data: one of which was to measure the teachers' TPACK and the other was to measure the teachers' ability in ICT integration as measured using the SAMR model. The TPACK questionnaire was adopted from Koehler & Mishra (2006) and Schmidt et al. (2009b) and the ICT integration questionnaire was modified from Jude et al. (2014) and Wahyuni et al. (2020). Some words and phrases such as "in my university" and "in my school" were changed into "my *madrasah*", "university students" was changed into "student", etc. Both questionnaires used 4 point Likert scale: Strongly Agree (4 points), Agree (3), Disagree (2), and Strongly Disagree (1) for positive statements and Strongly Agree (1), Agree (2), Disagree (3), and Strongly Disagree (4) for negative statements. The validity and reliability of the questionnaires was examined in two phases: content validity and face validity. Two experts were invited to examine the contents of the questionnaire resulting in some revisions: the statements (questions) should be a mixture of positive and negative statements; the statements shall not contain adverbs of frequency, some overlapping statements need to be marged (omit one of them). After revision, the two experts came into agreement and the contents were stated to be valid. Afterwards, 10 teachers having proximate characteristics with the respondents of this study were invited to respond to the questionnaires.

Table 1. Results of the validity test for the TPACK questionnaire

Respondent	TPACK						
	Q1	Q2	Q3	Q4	Q5	Q6	Q7

101

r_{xy}	0.875	0.954	0.954	0.973	0.636	0.895	0.818
Sig. Validity	0.001	0	0	0	0.048	0	0.004
Criteria	Valid	Valid	Valid	Valid	Valid	Valid	Valid

Table 2. Results of the reliability test for the TPACK Questionnaire

Cronbach alpha	**0.938**
Criteria	Reliable

The data analysis of the questionnaire test on SPSS version 18 showed that all statements of the TPACK questionnaire gained Sig. Validity below 0.5 which means all items were valid. Meanwhile, the α score of the questionnaire according to Cronbach Alpha was 0.938, below 0.7 ($\alpha = 0.938 \geq 0.7$) which means the questionnaire was reliable.

Table 3. Validity test of the ICT integration questionnaire

Respondent	ICT integration (SAMR model)											
	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**	**Q11**	**Q12**
r_{xy}	0.921	0.972	0.809	0.948	0.954	0.752	0.972	0.943	0.954	0.954	0.712	0.783
Sig. Validity	0	0	0.005	0	0	0.012	0	0	0	0	0.021	0.007
Criteria	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid

Table 4 Reliability test of the ICT integration questionnaire

Cronbach alpha	**0.973**
Criteria	Reliable

Likewise, the data analysis of the ICT integration questionnaire test showed that all statements of the questionnaire gained Sig. Validity below 0.5 which means all items were valid. Meanwhile, the α score of the questionnaire according to Cronbach Alpha was 0.973, below 0.7, which means the questionnaire was reliable.

After attaining the validity and realiability scores, the questionnaires were distributed to the respondents in March 2022. The gleaned data were then analysed using SPSS version 18 to measure their mean, median, and modus scores. The mean scores of the data were compared to four leveling chriteria, namely "Poor", "Sufficient", "Good", and "Very Good". Regression calculation was also done to see whether the respondents' TPACK influence their ICT integration.

Table 5. Levels of TPACK and ICT integration ability

Range	**Level**
$1 \leq x < 1{,}75$	Poor
$1{,}75 \leq x < 2{,}5$	Sufficient
$2{,}5 \leq x < 3{,}25$	Good
$3{,}25 \leq x \leq 4$	Very Good

Meanwhile, qualitative data were collected through semi-structured interviews which were triangulated through observations and documentation. The gleaned data were analyzed by applying Miles and Huberman's data analysis model which includes data reduction, data presentation, and conclusion drawing.

Table 6. Respondents of the qualitative phase

Informant	Age	Sex	Education	Teaching experience
Informant 1	47	Male	BA in English Education	> 6 years
Informant 2	46	Female	BA in English Education	> 6 years
Informant 3	42	Male	BA in English Education	> 6 years
Informant 4	24	Male	BA in English Education	4 years
Informant 5	48	Female	BA in English Education	> 6 years

The data analysis process was done by two analysts (coders/raters). After some discussion, an inter-rater agreement was reached so the rigor (external validity) of the data were attained (Creswell, 2014). The analyzed data were then returned to the informants for internal validity check (Creswell, 2014).

FINDINGS AND DISCUSSION

This section is divided into three parts. The first part presents the collected data on the TPACK of the English teachers in Banyumas Regency and its category: poor, sufficient, good, or very good. The second part shows the score of their ICT integration and its category. And, the third part displays the regression analysis on whether their TPACK influences their ICT integration.

The TPACK of Madrasah Aliyah English Teachers in Banyumas Regency

The interplaying combination of technological competency, subject matter (English), and teaching skill could be seen by the measurement of the teachers' TPACK as suggested by (Koehler & Mishra, 2006). The following table is a dataset yielded from the TPACK questionnaire given to all respondents (n=31).

Table 7. The TPACK of the English teachers

Respondents (n=31)	TPACK							Total Mean
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	
Mean	2.94	2.90	3.10	2.90	2.84	2.77	2.77	2.89

The total mean of the teachers' TPACK was 2.89 showing that their TPACK was at a good level since it was in the range of $2,5 \leq x < 3,25$. Meanwhile, the mean scores of Question 1 (Q1, and so forth) was 2.94 (good), Q2 was 2.90 (good), Q3 was 3.10 (good), Q4 was 2.90 (good), Q5 was 2.84 (good), Q6 was 2.77 (good), and Q7 was 2.77 (good).

The analysis of individual statements/aspects of the TPACK questionnaire resulted in the following description: The highest mean score (3.10) was gained by Q3 "I don't know how to adapt technology that I learned for my English teaching" followed by Q1 (2.94) "I know the technology that I can use to teach English well" and Q2 and Q4 with equal values (2.90 each). The Q2 read "I have problems choosing types of technology that could enhance my English teaching" while the Q4 asserted "It was hard for me to choose a technology in the classroom that enhances my way of teaching and what is learned by the students". Meanwhile, the lowest score (2.77) was gained by two statements: Q6 "I teach a lesson that combines language, technology, and pedagogy effectively" and Q7 "I applied various teaching approaches with various technologies to enhance the students understanding".

The above quantitative results are supported by qualitative results obtained through interviews, focused group discussion (FGD), observation, and document analysis. In the interviews, the teachers stated that they were aware of a wide variety of applications and technologies for English language learning.

Informant 1: Actually**,** *I'm a tech* stutterer, but I'm trying to learn what people are using, like using LCD, using Gmeet, Zoom, Gform, and Google Classroom.
Informant 3: In my opinion, technology in learning is just a modification to the learning medium. So far, learning without technology can run well. I prefer learning that involves realia and physical movement, more meaningful.
Informant 4: In the classroom I use LCDs, laptops, and speakers. Those devices make it easier for me to deliver material rather than using traditional media. If you want to find pictures, videos, or anything else, just *googl-ing* instead of looking for pictures in magazines.
Informant 2: In addition to the basic ones (LCD and Laptop), I once used a mentimeter for polling in class. During the pandemic I used Google Classroom, Google Meeting and WA, but I am more dependent on WA because many students complain of signals and pulses if they continue to use Google Meet.

In the FGD which was held on July 26, 2022 at the MAN 1 Banyumas Hall, the teachers conveyed that ICT competence is very necessary at this time, namely the era of the Industrial Revolution 4.0 and Society 5.0 where all human needs are easily done with the help of ICT. They mentioned various technologies and applications that have been used in teaching in their lesson plans.

Table 8. Various technologies used by the teachers

Hardware	Software	Internet Applications
Laptop, Personal Computer, LCD, Active speaker, speaker *Bluetooth*, and language lab,	Ms. Office, Software Pearson, and Software for language laboratory.	Google Classroom, Google Form, Google Meet, Zoom, Microsoft Teams, WhatsApp, Telegram, Mentimeter, and Edulastic.

Furthermore, the teachers conveyed that their awareness regarding the importance of using ICT emerged during the pandemic. Most of the teachers got to know more ICT because of the pandemic. Teachers underscored that the pandemic period was the time when they used ICT the most. This could train them to gradually fulfill the demands of curriculum 2013 and Merdeka curriculum (Kemdikbud, 2022; Mendikbud RI, 2013) which emphasizes technological literacy. Technological literacy is very important for the Industry 4.0 that is filled with the *Internet of Things* (IoT), automation, virtual reality, augmented reality, and algorithms (Rüßmann et al., 2015; Sawitri, 2019).

This study shows that the knowledge of MA English teachers in the use of ICT for teaching in Banyumas Regency was in "good" category. This "good" predicate, although it requires improvement, shows that the EFL teachers of MA in Banyumas Regency have a good knowledge of the relationship between subjects, how to teach them, and how to use technology to improve their quality (Koehler & Mishra, 2006). Good TPACK was also found in research by Mahdum (2015) in Pekanbaru, Surahman et al. (2020) in Garut, and Darsih et al. (2021) in Kuningan. In the questionnaire that Mahdum gave to 74 teachers, the average score of questions related to technology (technology-related items) was lower than those related to technology (non-technology-related items), but the average results of technology-related items

were still in the good category (Mahdum, 2015). Surahman in a survey of 24 teachers found the average aspect of Technological Knowledge of teachers was at 66.25% (moderate), Content *Knolwdge* at 82.71% (high), Pedagogical Knowledge at 80.21% (high), Pedagogical Content Knowledge at 76.56% (high), Technological *Content* Knowledge at 72.08 % (high), *Technological Pedagogical Knowledge* of 75.63% (high), and overall TPACK of 71.35% (high) so that the respondents were declared to be in the good category (Surahman et al., 2020). Meanwhile, Darsih, Suherdi dan Safrina (2021) through Content Study training, obtained data that although the respondents' knowledge on technology-realated item was lower than non-technology-related items in the self-assessment questionnaire compiled by Bingimlas (2018) from the theory of (Koehler & Mishra, 2006), however, the average value was in the good category too (Darsih et al., 2021).

These qualitative findings are in line with the qualitative findings where teachers name tools they had used in teaching both hardware, software, and internet applications. This result is very good point for authority in Banyumas regency to provide more facility for the enhancement of ICT integration. Similar results was found by (Sarıçoban et al., 2019) in Turki and (Paneru, 2018) in the Czech Republic. They stated that teacher's TPACK found in their studies was the main starting point for the ICT integration process. The low ICT literacy of the teachers in several previous studies conducted in developing countries was a major factor in the low process of ICT integration as discovered by (Kihoza et al., 2016) in Tanzania and (Fathi & Yousefifard, 2019) in Iran.

The ICT Integration of Madrasah Aliyah English Teachers in Banyumas Regency

The teachers were also invited to fill in a questionnaire to test their ability in integrating technology into their teaching based on the SAMR model. The following is the result of the mentioned data collection.

Table 9. ICT integration ability of the teachers

Respondent (n=31)	ICT Integration Capability (SAMR model)												Total mean
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	
Mean	3.10	2.29	2.35	3.23	2.42	1.58	1.94	2.03	1.42	1.42	1.74	1.87	2.12

The total mean of the respondents' ability in integrating ICT into English teaching activities was 2.12, falling in the range of $1,75 \leq x < 2,5$. It can be stated that their ability is at a "sufficient" level. Furthermore, the value of ICT integration capabilities in each statement (aspect) will be explained in the following section.

The highest mean score (3.23) was identified in the fourth statement/aspect "I used search engines such as Google to find important points of my subject" followed by the first statement "In developing materials, I used search engines such as Google, Bing, Yahoo! Etc. Instead of traditional printed book" with 3.10 points and then the fifth statement "I used different videos to explain my materials" with 2.42 points. Meanwhile, the lowest score (1.42) was gained by the ninth statement "I conducted interractive teaching by the help of technologies such as mentimeter.com, padlet, genially, etc." and tenth statement "I conducted classroom activities with technologies that cannot be done otherwise, such as inviting native spakers to the classroom through Cambly, omeTV, etc.".

In the qualitative phase, teachers showed the ability to use ICT which falls into three categories of Puentadura's SAMR model, namely Substitution, Augmentation, and Modification. In preparing learning which includes the preparation of syllabuses, annual programs, semester programs, lesson plans and preparation of teaching materials, all teachers used Microsoft office, namely Ms. Word, Ms. Excel, and Ms. PowerPoint. Based on observations made on July 26, 2022, the most frequently used technologies in the classroom were LCDs and speakers. Some teachers also used some new applications like mentimeter, padlet, Kahoot!, Quizziz, and Vocaroo.

Table 10. The teachers' ICT integration according to the SAMR model

Description	Category
The teacher prepares all the preparation (administration) of learning with Ms Word	*Substitution*
The teacher searches for additional material on the Internet	*Augmentaton*
The teacher searches for flashcards on the Internet and prints them in color	*Augmentation*
Teachers download audio and video materials from the Internet	*Augmantation*
The teacher uses an LCD and explains the material instead of a whiteboard	*Substitution*
The teacher pastes the audio material inside the slide show and plays it using Bluetooth speakers	*Modification*
The teacher pastes the video material inside the slide show and plays it using *bluetooth* speakers	*Modification*
Teachers give quizzes using Google Forms while automatically grading them	*Modification*
Teacher asks students to make *speaking* videos	*Modification*
Teachers make judgments with the Kahoot app! and Quizziz	*Modification*
Teachers make assessments with the help of Google Forms	*Modification*
Teacher asks students to submit work to Google Classroom	*Substitution*

The capability of the English teachers in Banyumas Regency in technology as examined by the SAMR-formatted questionnaire was at a sufficient level, namely the third level from the top (very good, good, sufficient, and poor). Overall, the teachers needed more input and training in order to improve their skills in ICT integration. Namely knowledge that combines content, pedagogy, and technology (Schmidt et al., 2009b). However, in the qualitative phase, based on the observations, the teachers exhibited indicators of three levels of the SAMR model, namely Substitution, Augmentation and Modification. In Pueterdura's assessment model of the technology integration, the teachers were at the third level (*Modification),* implying that the teachers could use technology and make major changes to the material to be compatible with technology (R. P. Puentedura, 2014). The ability of the teacher was at the stage of educational transformation (Jude et al., 2014; R. Puentedura, 2014). The results of this study have similarities with the findings of (Budiman et al., 2018) where the research respondents showed ability at the Modification level. Qualitative research by (Wahyuni et al., 2020) in Central Java found teachers showing all four levels of the SAMR model.

The effect of the Teachers' TPACK on their ICT Integration Ability

After retrieving descriptions of the teachers' TPACK and their ICT integration capability, the two datasets were than calculated through regression equation to see whether or not the teachers' TPACK affects their ICT integration capability:

Table 11. Total score of the teachers' TPACK and ICT integration capability

Respondents	TPACK	ICT Integration
R1	21	24
R2	16	22
R3	21	25
R4	19	32
R5	22	31
R6	18	15
R7	22	27
R8	21	25
R9	20	29
R10	25	30
R11	17	18
R12	21	23
R13	23	22
R14	24	23
R15	16	22
R16	21	25
R17	21	25
R18	16	19
R19	16	26
R20	21	24
R21	21	22
R22	18	31
R23	21	22
R24	21	33
R25	18	31
R26	22	23
R27	18	24
R28	21	26
R29	21	31
R30	24	33
R31	21	24

To find out the effect, the regression equation from the above data was searched using the SPSS application version 18. As for the coefficients of the regression equation obtained from the Coefficients table, the output of SPSS is as follows:

Table 12. Coefficients of regression equations
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.067	6.579		1.986	.057
	TPACK	.609	.323	.331	1.886	.069

a. Dependent Variable: SAMR

The table above shows that the coefficient values $a = 13.067$ and $b = 0.609$. Because this study did not perform sampling techniques on respondents, the regression equation in this study is as follows

$$Y = 13.067 + 0.609X$$

The equation above presents that the value of $b = 0.6090.609$ is a positive value, meaning that every variable X (TPACK) goes up, then the variable Y (ICT Integration) also goes up. In addition, the regression equation can show that every increase of 1 unit of variable X (TPACK) will have an impact of 0.609 increase on variable Y (ICT Integration).

The next data analysis is the coefficient of determination. The result of the determination coefficient value data is shown in the Model Summary table at the SPSS output.

Table 13. Coefficient of determination
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.331^a	.109	.079	4.326

a. Predictors: (Constant), TPACK

The coefficient of determination is indicated by the value R^2. The above table shows values $R^2 = 0.109 = 10,9\%$. This shows that in this study, 10.9% of variable Y (ICT Integration) was affected by variable X (TPACK). In searches across various article databases, no research has been found looking for the influence of TPACK on ICT integration. The research of (Kihoza et al., 2016) is the closest, but Kihoza et al. measured respondents' ICT capabilities by using two models (TPACK and SAMR) separately and did not look for correlation between them.

CONCLUSION

The TPACK of the English teachers in Banyumas Regency is in the "good" category. This is evidenced by the total mean of their TPACK being 2.89, which is in the range of $2,5 \leq$ x < 3,25. In the qualitative phase, teachers conveyed various hardwares (such as Laptops, PCs, LCDs), software (such as Ms. Office, Pearson Software, and language lab software), and internet applications (such as Google Classroom, Google Form, Quizziz, Edulastic) that had been used to improve teaching and learning. The teacher's ability to integrate ICT into English language teaching was in the "sufficient" category. The total mean of the teachers' ICT

integration cabaility was 2.12 falling in the range of $1,75 \leq x < 2,5$. In the qualitative phase, the teachers exhibited the ability to use ICT that meets the criteria of Substitution (S), Augmentation (A), and Modification (M). The highest level of capability, Redefinition (R), was not seen. The regression equation result showed that the value of the coefficient values $a = 13.067$ and $b = 0.609$ while the regression equation is $Y = 13.067 + 0.609X$. The equation showed that every increase of variable X (TPACK) affected an increase of variable Y (ICT Integration). Then it can be concluded that the teachers' TPACK has an influence on their ICT integration.

ACKNOWLEDGEMENTS

REFERENCES

Ammade, S., Mahmud, M., Jabu, B., & Tahmir, S. (2018). Integrating Technology in English Language Teaching: Global Experiences and Lessons for Indonesia. *International Journal of English Linguistics*, *8*(6), 107. https://doi.org/10.5539/ijel.v8n6p107

Antonio, A., Probitchado Jr, R., Ricohermoso, C., Saavedra, A., & de la Rama, J. M. (2020). Gender Differences in Technological Competence among Science Teachers: Implications. *International Journal of Advanced Science and Technology*, *29*(7), 13257–13268. http://sersc.org/journals/index.php/IJAST/article/view/29067

Bingimlas, K. (2018). Investigating the level of teachers' knowledge in technology, pedagogy, and content (TPACK) in Saudi Arabia. *South African Journal of Education*, *38*(3), 1–12. https://doi.org/10.15700/saje.v38n3a1496

Budiman, A. B., Rahmawati, R., & Ulfa, R. A. (2018). EFL Teacher's Belief and Practice on Integrating ICT in The Classroom: A Case Study on The Implementation of SAMR Model in Teaching Reading Descriptive Text at MA Assalam, Sukoharjo. *Jurnal Penelitian Humaniora*, *19*(2), 39–51. https://doi.org/10.23917/humaniora.v19i2.6809

Cooperman, L. (2018). So You Want to Teach Online. *The Art of Teaching Online*, 1–5. https://doi.org/10.1016/b978-0-08-101013-6.00001-1

Creswell, J. W. (2014). Research Design Qualitative, Quantitative, and Mixed Methods Approaches. In V. Knight (Ed.), *SAGE* (4th ed.). SAGE.

Darsih, E., Suherdi, D., & Safrina. (2021). Changes in Indonesian EFL Lecturers' Technological Pedagogical Content Knowledge (TPACK) after Lesson Study. *Journal of Physics: Conference Series*, *1752*(1), 1–13. https://doi.org/10.1088/1742-6596/1752/1/012070

El-Ghalayini, H., & El-Khalili, N. (2012). An approach to designing and evaluating blended courses. *Education and Information Technologies*, *17*(4), 417–430. https://doi.org/10.1007/s10639-011-9167-7

Fathi, J., & Yousefifard, S. (2019). Assessing Language Teachers' Technological Pedagogical

Content Knowledge (TPACK): EFL Students' Perspectives. *Research in English Language Pedagogy RELP*, *7*(1), 255–282. https://doi.org/10.30486/relp.2019.665888

Fithri Al-Munawwarah, S. (2014). Teachers' Perceptions on the Use of Ict in Indonesian Efl Learning Context. *English Review: Journal of English Education*, *3*(1), 1–11. https://journal.uniku.ac.id/index.php/ERJEE/article/view/116/78

Hockly, N., Dudeney, G., & Pegrum, M. (2014). *Digital literacies* (1st ed.). Routledge. https://doi.org/https://doi.org/10.4324/9781315832913

Jude, L., Kajura, M., & Birevu, M. (2014). Adoption of the SAMR Model to Asses ICT Pedagogical Adoption: A Case of Makerere University. *International Journal of E-Education, e-Business, e-Management and e-Learning*, *4*(2). https://doi.org/10.7763/ijeeee.2014.v4.312

Katemba, C. V. (2020). Teachers' Perceptions in Implementing Technologies In Language Teaching and Learning in Indonesia. *Acuity: Journal of English Language Pedagogy, Literature and Culture*, *5*(2), 38–51. https://doi.org/10.35974/acuity.v5i2.2299

Kemdikbud. (2022). Buku Saku Kurikulum Merdeka; Tanya Jawab. *Kementerian Pendidikan Dan Kebudayaan*, 1–50.

Kihoza, P., Zlotnikova, I., Bada, J., & Kalegele, K. (2016). Classroom ICT integration in Tanzania: Opportunities and challenges from the perspectives of TPACK and SAMR models. *International Journal of Education and Development Using Information and Communication Technology*, *12*(1), 107–128.

Koehler, M. J., & Mishra, P. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, *108*(6), 1017–1054. https://doi.org/https://doi.org/10.1111/j.1467-9620.2006.00684.x

Kusuma, I. P. I. (2020). *Mengajar Bahasa Inggris Dengan Teknologi: Teori Dasar Dan Ide Pengajaran*. Deepublish.

Lasi, H., Fettke, P., Kemper, H.-G., Feld, T., & Hoffmann, M. (2014). Industry 4.0. *Business & Information Systems Engineering*, *6*(4), 239–242.

Levin, T., & Wadmany, R. (2006). Teachers' beliefs and practices in technology-based classrooms: A developmental view. *Journal of Research on Technology in Education*, *39*(2), 157–181. https://doi.org/10.1080/15391523.2006.10782478

Lubis, A. H. (2018). Integrasi TIK Dalam Pengajaran Bahasa Inggris di Indonesia Abad ke-21: Mitos dan Realita. *Cakrawala Pendidikan*, *37*(1), 11–21.

Mahdi, A. (2013). Sejarah Dan Peran Pesantren Dalam Pendidikan Di Indonesia. *Islamic Review: Jurnal Riset Dan Kajian Keislaman*, *2*(1), 1–20. https://journal.ipmafa.ac.id/index.php/islamicreview/article/view/29/23

Mahdum. (2015). Technological pedagogical and content knowledge (TPACK) of english teachers in Pekanbaru, Riau, Indonesia. *Mediterranean Journal of Social Sciences*,

6(5S1), 168–176. https://doi.org/10.5901/mjss.2015.v6n5s1p168

Mardiana, H. (2020). Lecturers' Attitudes towards Online Teaching in the Learning Process. *Register Journal*, *13*(1), 77–98. https://doi.org/https://doi.org/10.18326/rgt.v13i1.77-98

Mendikbud RI. (2013). *Implementasi Kurikulum 2013* (p. 38).

Nair, R. S., & Chuan, T. C. (2021). Integrating Technology that Uses Modified SAMR Model as a Pedagogical Framework in Evaluating Learning Performance of Undergraduates. *The Educational Review, USA*, *5*(10), 373–384. https://doi.org/10.26855/er.2021.10.001

Nugroho, A., & Mutiaraningrum, I. (2020). EFL teachers' beliefs and practices about digital learning of English. *EduLite: Journal of English Education, Literature and Culture*, *5*(2), 304. https://doi.org/10.30659/e.5.2.304-321

Paneru, D. R. (2018). Information communication technologies in teaching english as a foreign language: Analysing EFL teachers' TPACK in Czech elementary schools. *Center for Educational Policy Studies Journal*, *8*(3), 141–163. https://doi.org/10.26529/cepsj.499

Priyadi, M., Sarwa, Lisyanto, & Basuki, N. (2021). Indonesian Teacher's Competencies Profile According to the SAMR Model Framework. *Journal of Physics: Conference Series*, *1842*(1). https://doi.org/10.1088/1742-6596/1842/1/012083

Puentedura, R. (2006). *Transformation, technology, and education*. http://hippasus.com/resources/tte/.

Puentedura, R. (2014). Learning, technology, and the SAMR model: Goals, processes, and practice. *Ruben R. Puentedura's Weblog*. hippasus.com/rrpweb log/archives/2 014/0 6/29/ LearningTechnologySAMRModel.pdf.

Puentedura, R. P. (2014). *Building transformation: An introduction to the SAMR model*. http://www.hippasus.com/rrpweblog/archives/BuildingTransformation_ AnIntroductionToSAMR.pdf.

Restiana, N., & Pujiastuti, H. (2019). Pengukuran Technological Pedagogical Content Knowledge untuk Guru Matematika SMA di Daerah Tertinggal. *Mosharafa: Jurnal Pendidikan Matematika*, *8*(1), 83–94. https://doi.org/10.31980/mosharafa.v8i1.407

Rüßmann, M., Lorenz, M., Gerbert, P., Waldner, M., Justus, J., Engel, P., & Harnisch, M. (2015). Industry 4.0: The future of productivity and growth in manufacturing industries. *Boston Consulting Group*, *9*(1), 54–89.

Sarıçoban, A., Tosuncuoğlu, I., & Kırmizi, Ö. (2019). A technological pedagogical content knowledge (TPACK) assessment of preservice EFL teachers learning to teach English as a foreign language. *Journal of Language and Linguistic Studies*, *15*(3), 1122–1138. https://doi.org/10.17263/jlls.631552

Sawitri, D. (2019). Revolusi Industri 4.0 : Big Data Menjawab Tantangan Revolusi Industri 4.0. *Jurnal Ilmiah Maksitek*, *3*(November), 15–27.

https://makarioz.sciencemakarioz.org/index.php/JIM/article/view/83/80

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009a). Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice Teachers. *Journal of Research on Technology in Education*, *42*(2), 123–139. https://doi.org/https://doi.org/10.1080/15391523.2009.10782544

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009b). Technological pedagogical content knowledge (TPACK) the development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education*, *42*(2), 123–149. https://doi.org/https://doi.org/10.1080/15391523.2009.10782544

Suardi, I., & Hamid, S. (2013). Technology on Language Teaching and Learning : A Research on Indonesian Pesantren. *Procedia - Social and Behavioral Sciences*, *83*, 585–589. https://doi.org/10.1016/j.sbspro.2013.06.111

Suhardiana, I. P. A. (2019). Peran Teknologi Dalam Mendukung Pembelajaran Bahasa Inggris Di Sekolah Dasar. *Adi Widya: Jurnal Pendidikan Dasar*, *4*(1), 92. https://doi.org/10.25078/aw.v4i1.934

Suherdi, D. (2015). English for 21st Century Indonesia. *Proceeding of EDUTICON (English Education International Conference), November 4-5, 2015.*

Sukhodolov, Y. A. (2019). The notion, essence, and peculiarities of industry 4.0 as a sphere of industry. In E. G. Popkova, Y. V. Ragulina, & A. V. Bogoviz (Eds.), *Industry 4.0: Industrial Revolution of the 21st Century* (pp. 3–10). Springer. https://doi.org/10.1007/978-3-319-94310-7_1

Surahman, E., Thaariq, Z. Z. A., Qolbi, M., & Setiawan, A. (2020). *Investigation of the High School Teachers TPACK Competency in South Garut, West Java, Indonesia*. *501*(Icet), 461–466. https://doi.org/10.2991/assehr.k.201204.089

Uerz, D., Volman, M., & Kral, M. (2018). Teacher educators' competences in fostering student teachers' proficiency in teaching and learning with technology: An overview of relevant research literature. *Teaching and Teacher Education*, *70*, 12–23. https://doi.org/https://doi.org/10.1016/j.tate.2017.11.005

Wahyuni, S., Mujiyanto, J., Rukmini, D., & Fitriati, S. W. (2020). *Teachers' Technology Integration Into English Instructions: SAMR Model*. *July*. https://doi.org/10.2991/assehr.k.200620.109

Yücel, A. S., & Koçak, C. (2010). Evaluation of the basic technology competency of the teachers candidate according to the various variables. *Procedia - Social and Behavioral Sciences*, *2*(2), 1310–1315. https://doi.org/10.1016/j.sbspro.2010.03.192