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Preparing the Preservice Teachers to be the Industrial Revolution Teacher 4.0 Era

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Abstract: Teacher preparation program is routinely making decisions regarding the best pedagogical methods from field experience studies, it can alter students' understandings about academic content and some characteristics through professional practices. Presently, we are entering an educational setting which is known as education 4.0, the technology-based teaching and learning method. It aims to improve the digital technological competencies across all levels and to enhance the use of digital technologies for teaching and learning. This education must help to widen learners' competencies to apply the new technology, which will help the learners to develop in relation to the changes in society. This study was conducted to investigate how the preservice teacher integrated technology in teaching practice. Twenty three preservice English teachers have participated in this research. Data were gathered through observation and document analysis and were analyzed qualitatively. Results indicated that preservice teachers were able to construct and deliver the lesson plan in teaching practice. In addition, over the teaching practice, there was some media technology generated in which it can be used by the preservice teachers in their teaching practicum.

Keywords: *preservice teacher, teacher 4.0, media technology*

INTRODUCTION

Education 4.0, in which we are crossing recently, where the teaching and learning are done under the technology-based teaching and learning method is a complex, dialectical, and exciting opportunity (Marwala, 2017) focusing on the improvement of the digital technological competencies through all levels of education and the usage of digital technologies in teaching and learning practices (Hariharasudan & Kot, 2018). These technologies powered by artificial intelligence required certain skills. These skills are critical thinking, people management, emotional intelligence, judgment, negotiation, cognitive flexibility, and knowledge production management (Marwala, 2017), (Shahroom & Hussin, 2018). In order to get the cinergy with the goal of education in globalization era, education 4.0 must be able help to widen learners' competencies to apply the new technology, which will help the learners to develop in relation to the changes in society (Anggraeni, 2018). In educational systems, teachers and preservice teachers are the keys to the effective use of technology in the teaching and learning processes (Yurdakul, Ursavaş, & Gökçe, 2014).

Education 4.0 give the autonomous to the learners to grow with knowledge and skills for their entire life which enables individuals to be able to live in a society and be equipped with the best of his/her competencies. Education 4.0 focuses on innovation and maximizes the use of information, internet, and technology. The use of internet and technology can't be avoided. Teachers in the 4.0 era are called teacher 4.0, a name or a concept to be adapted for future teachers who are able to handle new technology and who implement it efficiently in their classes (Abdelrazeq, Janssen, Tummel, Richert, & Jeschke, 2016). Teacher 4.0 is a professional teacher with various competence required in transferring knowledge to their students (Susilowati, Sutanto, & Daharti, 2013), (Shabir, 2015).

Competence is the ability of a person to exercise or perform a job or task that is based on skills, knowledge, and attitudes supported by work in accordance with the demands of the job (Hakim, 2015) to achieve the desired result (Kumalasari, Setiawan, & Sumarlam, 2017). There are four competencies are required to be a professional teacher; pedagogical competence, personal competence, professional competence and social competence (pp. No.19 of 2005). The success of any educational process depends on teacher competency, teaching aptitude, and attitude towards teaching of the teacher and many more factors. Teacher competency refers to the results a teacher gets or to the amount of progress the pupils make towards some specified goal of education. The teacher education program is an effective means for making a teacher competent and efficient (Singh, 2012).

The guiding mission of the teacher education program at the university is to create teachers who are scholars and leaders. While the intent of that mission is basically sound in theory—we instill the idea that teachers at all levels are professionals, always learning and growing in knowledge—that theory, that philosophical underpinning does not ensure that the students who complete the program are confident about the act or performance of teaching (Schmidt & Thomas, 2009) especially when they have to practice at school as the pre-service teacher.

In all education systems, the performance of teachers is one of the handfuls of factors determining school effectiveness and learning outcomes (Nadeem et al., 2011). The success of any educational process depends on teacher competency, teaching aptitude and attitude towards teaching of the teacher and many more factors. Teacher competency refers to the results a teacher gets or to the amount of progress the pupils make towards some specified goal of education. The teacher education program is an effective means for making a teacher competent and efficient (Singh, 2012)

Teaching is the process of transmitting knowledge which involves the teacher and learner. It is the process of attending to people's needs, experiences and feelings, and making specific interventions to help them learn a particular thing (Stella, Ihechukwu, & Eucharia Ndidi, 2017). In order to strengthen students to be competent teachers, universities and educators need to prepare the pre-service teacher to adapt to the changing trend and new knowledge and skills based on the cyber-physical system as part of everyone's life to face the future generation Z students through the instructional subject. Teacher preparation and development acts as a major role in the way of growing up quality of education (Nuangchalerm & Prachagool, 2010).

As now we are entering the education of technological-based era 4.0 an educator of this era should be able to adapt and to adopt the technology to be brought in the teaching and learning atmosphere. Adapt means an educator's ability to follow the changing world including the technology. Adopt is the ability to integrate technology with the subject matter in the teaching and learning process. Preparation of preservice teachers for their changing role in the information era requires equipping them with the knowledge, skills, and dispositions required to transform education, assisted by the vast capabilities made available by information and communication technologies (ICT) (Forkosh-baruch, 2018).

As it has been mentioned in the introduction, one of the competence should be mastered by a teacher is pedagogical competence. Generally speaking, pedagogical competence is the ability to understand the learners, to design curriculum or syllabus, and to actualize the learners into their various potentials. Pedagogical competence can be described as the ability and the will to regularly apply the attitude, knowledge, and skills that promote learning from definite goals and frameworks through continuous development of teaching in the best way. One of the subskills

in pedagogical competence is mastering technology (Puspitasari, Anugerahwati, & Rachmajanti, 2016).

Although there is general agreement that ICT integration in teaching and learning is necessary for educating students in the information era, according to a review of preservice teacher education programs which integrate ICT, these do not seem to develop sufficient skills to reach this goal (Lim, C. P., Chai & Churchill, 2011), (Tondeur, Brussel, Braak, Guoyuan, & Voogt, 2012). Therefore, educators need to equip preservice teachers with broad and adaptable technological skills and competences. Equipping pre-service teachers with technology skills and knowledge is now regarded as a vital element of any teacher-training program so as to capacitate the new teachers to meet the educational demands of the twenty-first century (Batane & Ngwako, 2017).

Efforts have been made worldwide in attempts to achieve the best preparation for preservice teachers in technology-enhanced teaching. One of them is by integrating technology through curricula (Tondeur et al., 2012). Teaching Strategy is a subject in the English Education Study Program of Teacher Training Faculty of Universitas Suryakancana. The subject was given to the sixth-semester students who are going to have a teaching practicum at school in the following semester called as a pre-service teacher. One of the objectives of this subject is in line with the law of teachers and lecturers, preparing the students to be professional teachers by empowering them with media technology literacy through the teaching practice.

Teaching practice is very important in pre-service teacher education. A good outing during teaching practice exercise of pre-service teachers is a pointer towards future success in the teaching profession (Stella et al., 2017). Teaching practice exposes pre-service teachers to new perspectives as well as prepares them in knowledge and skills. Teaching practice offers the practicing students an opportunity to engage in profitable experiences in observing, sharing, participating, and teaching with the supervision of more experienced teachers. With teaching practice, the pre-service teacher understands the rudiments of teaching which include; use of teaching materials, methods of teaching, lesson planning, classroom management confidence, and composure while in the classroom. Hence, this study aims to report how pre-service integrated technology in teaching strategy.

METHODOLOGY

The design of the study adopted is descriptive quantitative which attempts to describe the teachers' pedagogical and professional competences in the process of teaching and learning English through contents (Gay, Mills, & Airasian, 2012). The subjects of the study involved were 23 students of the sixth-semester students of the English Education Study Program in the Academic Year 2018/2019. Thus, for this study, the focus is on the teaching of English. To obtain data to respond to the study question, two instruments were made use; the document analysis (lesson plans) and classroom observation sheets for the instructional process.

This study engaged with naturalistic observation. The researcher in this study was also a student' lecturer, so she was able to sit in the classrooms doing the evaluations to know how the participants conducted the teaching practice. The evaluation was conducted using the observation sheet contains the variables issued by the Teacher Training and Education Faculty of Suryakancana University. The variables are pre-activities (brainstorming, apperception, explaining learning objectives, reviewing the previous lesson, introducing new concepts), whilst activities (teachers' mastery of materials, chronological event, questioning, methods/strategies and instructional media mastery, feedback, modeling, classroom management, and teacher-

student interaction), post activities (summarizing teaching material, reflection, assessment, and follow up), and supporting factors (communicativeness of the language used, clarity, acceptability, readability, dressing, gesture, and time management).

Document analysis was analyzed as an effort to get more understanding about the pre-service teachers' ability in composing lesson plans. It contains such variables as identity of the subject, pre-activities (brainstorming, apperception, explaining learning objectives, reviewing the previous lesson, introducing new concepts), whilst activities (teachers' mastery of materials, chronological event, questioning, methods/strategies and instructional media mastery, feedback, modeling, classroom management, and teacher-student interaction), post activities (summarizing teaching material, reflection, assessment, and follow up).

Information from the observation guides and the analyzed documents was typed into the same document to be read as one piece during coding. The data was then read through and coded, assigning descriptive codes to the information. Themes were then generated from the codes providing answers to the research questions of the study. The analysis of data involved making reference to the literature and the identified constructs in the theoretical framework that guided the study to establish whether the findings of this study corroborated propositions of the framework or whether they differed.

RESULT OF THE STUDY

The total participants in this study were 23 students. The results of this study indicated that out of the 23 participants used technology during the delivery of their lessons. They have used some type of technology in the form of a cell phone and laptop as teaching media to supplement their lessons. Based on the data analysis it was recorded that there were 18 types of media technology were generated over the students' teaching practices. RWT Timeline, VOA Learning English, Padlet, Grammar Bahasa Inggris, Canva, Viva Video, Boocktrack, Orai, miMind, Lyric Training, Quizlet, JOOX, Write About, Google form, *BAHASO*, Quizizz, and Kahoot. Those media were used to equipped in different language skills; reading, writing, listening, speaking, and language competence; grammar, and vocabulary (Table 1).

Table 1. Media Technology Used by the Students in Teaching Practice

No	Media	Topic/Skill
1	RWT Timeline	Recount/Writing
2	VOA Learning English	News Report/Speaking
3	Padlet	Descriptive Text/Writing
4	Grammar Bahasa Inggris	Grammar/Tenses
5	Canva	Advertisement/Writing
6	Viva Video	Story Telling/Reading
7	Boocktrack	Reading
8	Orai	Speaking
9	miMind	Tenses
11	Lyric Training	Listening/vocabulary
12	Quizlet	Reading/Descriptive
13	JOOX	Song Lyric/Writing
14	Write About	Writing
15	Google form	All skills
16	BAHASO	Writing
17	QUIZIZZ	All skills
18	Kahoot	All skills

DISCUSSION

As it has been mentioned in the introduction, one of the competence should be mastered by a teacher is pedagogical competence. Generally speaking, pedagogical competence is the ability to understand the learners, to design curriculum or syllabus, and to actualize the learners into their various potentials. Pedagogical competence can be described as the ability and the will to regularly apply the attitude, knowledge, and skills that promote learning from definite goals and frameworks through continuous development of teaching in the best way. One of the subskills in pedagogical competence is mastering technology (Puspitasari et al., 2016).

Therefore, educators need to equip preservice teachers with broad and adaptable technological skills and competences. Equipping pre-service teachers with technology skills and knowledge is now regarded as a vital element of any teacher-training program so as to capacitate the new teachers to meet the educational demands of the twenty-first century (Batane & Ngwako, 2017). One of the efforts that were done was integrating technology in teaching subjects. Teaching Strategy is a subject aimed to help the preservice teacher to be a professional teacher by equipped them on how to compose a correct lesson plan and to deliver it in teaching practice.

Based on the data analysis on the students' lesson plan it can be described that the students were able to compose the correct lesson plan based on the guidance syllabus. The majority of it contains the three variables as the identity of the subject, pre-activities, whilst activities, and post activities.

The result of the observation on pre-service teachers delivering the lesson plan shows that the majority of pre-service teachers delivering the lesson plan orderly. Yet, some of them did skip in the pre-activities especially in the two variables apperception and introducing new concepts. On the whilst activities and post activities were conducted well. Another weakness is the use of language. The pre-service teacher needs a big effort to increase their communicative competence. The study reported that philosophical underpinning does not ensure that the students who complete the program are confident about the act or performance of teaching (Schmidt & Thomas, 2009) especially when they have to practice at school as the pre-service teacher.

This study also revealed that technology was greatly used by pre-service teachers. Based on the result of the observation presented in Table 1 shows that there are 18 media technology were used by the preservice teacher to equip their teaching and learning. The first app is RWT Timeline to teach writing skill especially Recount text (Figure 1). VOA Learning English (Figure 2) is used to teach speaking skill especially News Reports. Padlet application is applied in wrtiting class. It can be used to teach descriptive text (Figure 3). Grammar Bahasa Inggris apply to assit learning og grammar (Figure 4). Canva is used to equip in learning writing especially adverticement (Figure 5). Viva Video is to teach reading (Figure 6). Boocktrack is used in reading class. Orai is applied in the speaking class. Then, miMind is used to teach teanses (Figure 7). Lyric Training is used in listening class especially to help students in vocabulary mastery. Quizlet is used in the teaching of descriptive text in the reading class (Figure 8). JOOX can be applied in the writing class (Figure 9). Write About is used in the writing class (Figure 10). Google form can be applied in the four skills of language learning (Figure 11). *BAHASO* is used in the writing class (Figure 12). Quizizz (Figure 13) and Kahoot (Figure) are used to equipped in different language skills; reading, writing, listening and speaking.

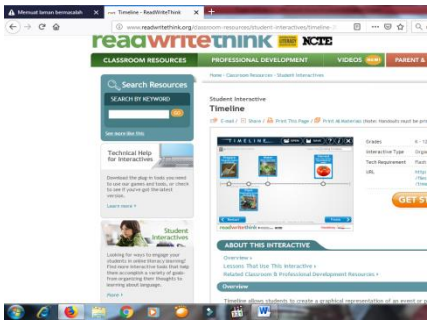

Figure 1. RWT App

Figure 2. VOA

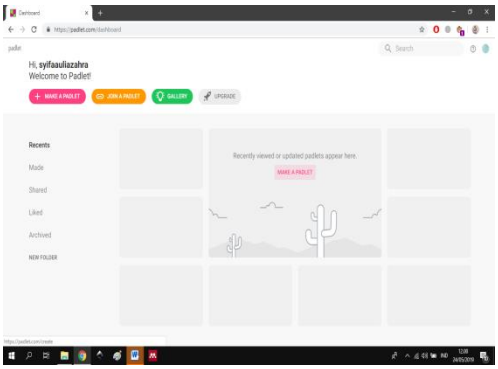

Figure 3. Padlet App

Figure 4. Grammar English App

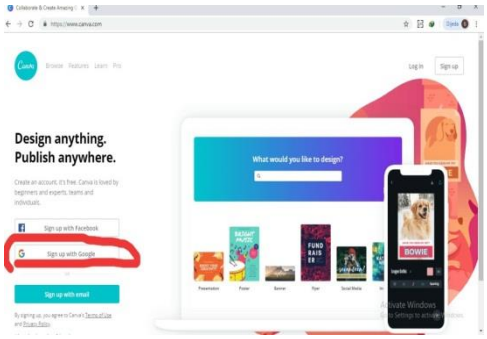

Figure 5. Canva

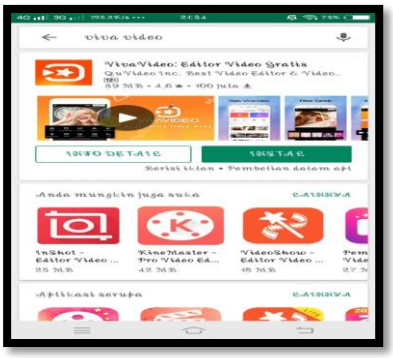

Figure 6. Viva Video

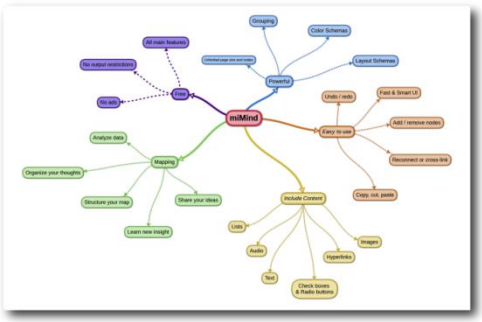

Figure 7. miMind

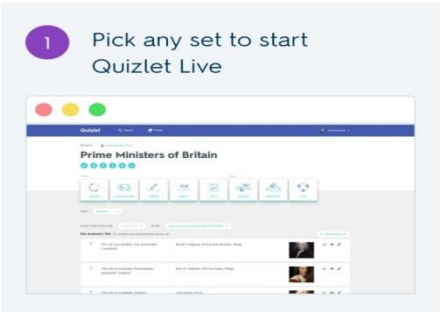

Figure 8. Quizlet

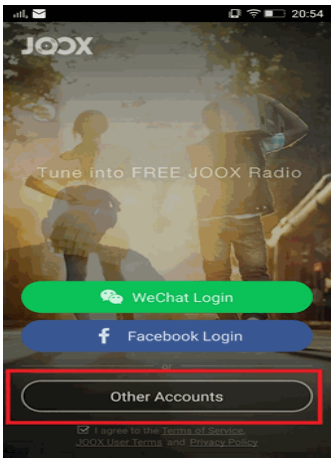

Figure 9. JOOX

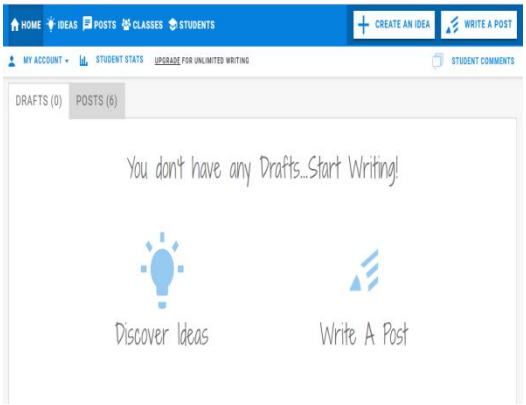

Figure 10. Write About

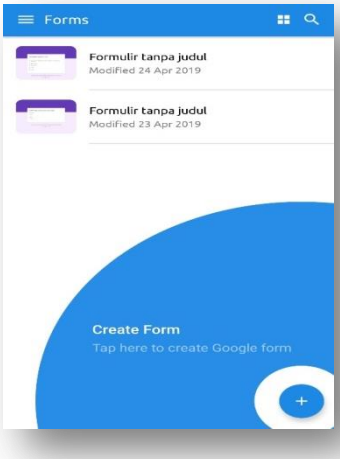

Figure 11. Google Form

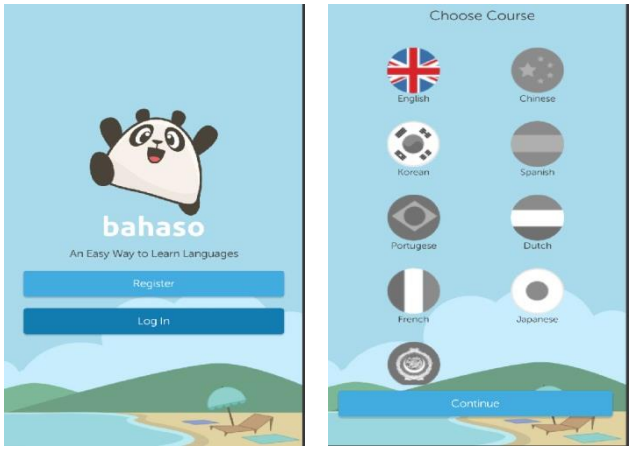

Figure 12. BAHASO App

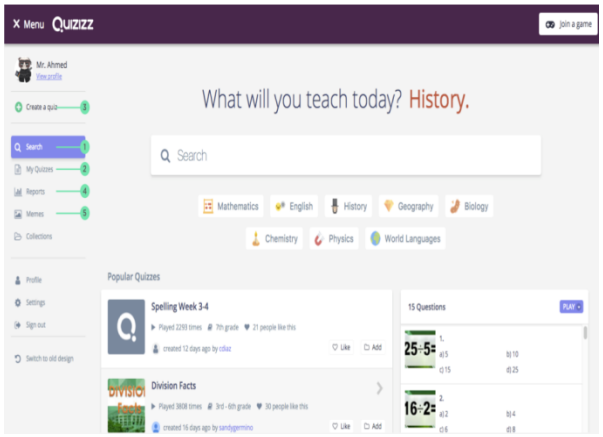

Figure 13. Quizzizz App

Through the teaching practice in the classroom strengthened the preservice teacher to be more ready in conducting the teaching practicum. This learning activity not only prepared the preservice teachers for their changing role in the information era requires equipping them with

the knowledge, skills, and dispositions required to transform education but also assisted by the vast capabilities made available by information and communication technologies (Forkosh-baruch, 2018). Their pedagogical competence was also increased. The preservice teachers were able to use technology effectively. As it is stated that pedagogical competence is the key to the effective use of technology in the teaching and learning processes (Yurdakul et al., 2014). The preservice teachers might select the appropriate media that fit the language skills for their teaching in the classroom.

CONCLUSION

Education 4.0 required teacher to master the pedagogical competence by mastering media technology. Therefore, educators need to equip preservice teachers with broad and adaptable technological skills and competences. Equipping pre-service teachers with technology skills and knowledge is now regarded as a vital element of any teacher-training program so as to capacitate the new teachers to meet the educational demands of the twenty-first century. One of the objectives of this subject is in line with the law of teachers and lecturers, preparing the students to be professional teachers by empowering them with media technology literacy through the teaching practice.

REFERENCES

Abdelrazeq, A., Janssen, D., Tummel, C., Richert, A., & Jeschke, S. (2016). Teacher 4.0: Requirements of the Teacher of the Future in Context of the Fourth Industrial Revolution. *ICERI*, (November).

Anggraeni, C. W. (2018). Promoting Education 4 . 0 in English for Survival Class : What are the Challenges ? *METATHESIS Journal of English Language, Literature, and Teaching*, *2*(1), 12–24. https://doi.org/10.31002/metathesis.v1i2.676

Batane, T., & Ngwako, A. (2017). Technology use by pre-service teachers during teaching practice : Are new teachers embracing technology right away in their first teaching experience ? *Australasian Journal of Educational Technology*, *33*(1), 48–61.

Forkosh-baruch, A. (2018). Preparing Preservice Teachers to Transform Education with Information and Communication Technologies (ICT). In *Handbook of Information Technology in Primary and Secondary Education* , (eds, pp. 1–18). Springer International Publishing.

Gay, L. R., Mills, G. E., & Airasian, P. (2012). *EDUCATIONAL RESEARCH Competencies for Analysis and Applications*.

Hakim, A. (2015). Contribution of Competence Teacher (Pedagogical , Personality , Professional Competence and Social) On the Performance of Learning. *The International Journal Of Engineering And Science*, *4*(2), 01–12.

Hariharasudan, A., & Kot, S. (2018). A Scoping Review on Digital English and Education 4.0 for Industry 4.0. *Soc.Sci*, *7*.

Kumalasari, S. P., Setiawan, B., & Sumarlam. (2017). Pedagogical Competence of Indonesia Teacher Viewed from the Anecdote Writing Lesson Planning. *Lingua Didaktika*, *11*(2), 146–156. https://doi.org/10.24036/ld.v11i1.8054

Lim, C. P., Chai, C. S., & Churchill, D. (2011). A framework for developing pre-service teachers' competencies in using technologies to enhance teaching and learning. *Educational Media International*, *48*(2), 69–83.

Marwala, B. X. and T. (2017). Implications of the Fourth Industrial Age on Higher Education.

Science and Technology, *73*. Retrieved from https://www.google.com/search?

Nadeem, M., Rana, M. S., Lone, A. H., Maqbool, S., Naz, K., & Ali, A. (2011). Teacher ' s Competencies and Factors Affecting the Performance of Female Teachers in Bahawalpur (Southern Punjab) Pakistan . *International Journal of Business and Social Science*, *2*(19), 217–222.

Nuangchalerm, P., & Prachagool, V. (2010). Influences of Teacher Preparation Program on Preservice Science Teachers ' Beliefs. *International Education Studies*, *3*(1), 87–91.

Puspitasari, A., Anugerahwati, M., & Rachmajanti, S. (2016). Teachers Pedagogical and Professional Competences in CLIL-Based Primary Schools in Indonesian Context. In *International Conference on Education* (pp. 105–115). Malang: Graduate School, Universitas Negeri Malang.

Schmidt, R., & Thomas, P. . (2009). *21st Century Literacy If We Are Scripted, Are We Literate?* (B. Barrell, R. Brock, S. Petrina, C. Quail, N. Rodriguez, L. Villaverde, & J. Willinsky, Eds.) (5th ed.). USA: Springer.

Shabir, M. U. (2015). KEDUDUKAN GURU SEBAGAI PENDIDIK: (Tugas dan Tanggung Jawab, Hak dan Kewajiban, dan Kompetensi Guru). *AULADUNA*, *2*(2), 221–232.

Shahroom, A. A., & Hussin, N. (2018). Industrial Revolution 4 . 0 and Education. *International Journal of Academic Research in Business and Social Sciences*, *8*(9), 314–319. https://doi.org/10.6007/IJARBSS/v8-i9/4593

Singh, Y. P. (2012). IMPACT OF PRE-SERVICE TEACHER EDUCATION TRAINING ON ATTITUDE. *Mangalmay Journal of Education and Pedagogy*, *3*(1).

Stella, J. O., Ihechukwu, B. N., & Eucharia Ndidi, I. (2017). Influence of Teaching Practice Exercise on Pre-service Teachers ' Professional Development. *IOSR Journal of Research & Method in Education*, *7*(5), 34–39.

Susilowati, I., Sutanto, H. A., & Daharti, R. (2013). Strategi peningkatan kompetensi guru dengan pendekatan. *JEJAK Journal of Economics and Policy*, *6*(1), 80–92. https://doi.org/10.15294/jejak.v6i1.3750

Tondeur, J., Brussel, V. U., Braak, J. Van, Guoyuan, S., & Voogt, J. (2012). Preparing pre-service teachers to integrate technology in education : A synthesis of qualitative evidence. *Computers & Education*, (October 2017), 1–32.

Yurdakul, I. K., Ursavaş, Ö. F., & Gökçe, B. I. (2014). An Integrated Approach for Preservice Teachers ' Acceptance and Use of Technology : UTAUT-PST Scale * Suggested Citation : *Eurasian Journal of Educational Research*, (55), 21–36.