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BUKTI REVISI ARTIKEL

DOES THE TEACHING AND LEARNING PROCESS IN INDONESIAN PRIMARY SCHOOLS CORRESPOND TO THE CHARACTERISITICS OF THE 21ST LEARNING?

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This paper sheds some light on extent to which the teaching and learning process in the primary school context has met the characteristics of the 21st century learning, and factors affecting it. This case study research garnered the data from 120 elementary school teaachers of 40 primary schools, 20 of which were municipal primary schools, while the other half were peripheral. The data, collected through observation and interview, were analysed using interactive model and quantitatively descriptively presented. The empirical evidence showed that the process of teaching and learning performed by the majority of the primary school teachers did not feature the 21st century learning given the statistical evidence: the majority of the instruction adopting teacher-centered learning (94,17%), use of conventional methods (59.17%) resulting in less development of students' higher order thingking (HOT), the absence use of technologies in teaching and learning (100%), and disconform of students' learning development at primary level (53,33%). However, the teachers were found to have some strength in terms of content mastery (95%) who could explicitly and completely deliver the materials in the class. The absence of the digital infrastructure in the schools, and lack of pedagogical and technological knowledge and understanding of students' development remained the challenges in catering the characteristics of the 21st century learning in the classrooms.

Keywords: Primary schools, 21st century learning, teacher competence, ICT.

INTRODUCTION

The 21st century is known as the digital age, where all sectors, including education should be digitalized, and in which technologies play a fundamental role in education (Henrisken at al., 2016). For this reason, educational development should be oriented to towards the use of ICT (Information Communication and Technology) as the management system *in situ* (Soderstorm at al., 2011). Education should integrate ICT in its process unless it will experience setback, not to mention a failure (Dass, 2014).

Similarly, teachers should revitalize their basic pedagogical practices, from instructional theories to practices. Hashim (2014) opines that the theoretical basis of the teaching and learning in the 21st century does not only underlie "constructivism" but also "connectivism" philosophy of learning, where students are connected through digital media. Likewise, in its practice, the approach and paradigm of teaching and learning have shifted from learner-centered learning to student-self directed learning (Hashim, 2014), the students seek for the knowledge not trasnfered (Ismail, 2017; Wijaya at al., 2016). Students look for information from various resrouces through the use of ICT as it enables them to access to a wide array of information at anytime and anywhere (Hellebrandt, 1996; Sasmoko, 2014; Wijaya at al., 2016).

ICT has yieled profound effects on the teaching and learning for both the teachers and students (Ghavifekr & Rosdy, 2015), and afforded the opportynity to create creative and effective learning (Oxana & Moeller, 2012). ICT also benefits and provides chances for the students to access unlimited amount of information rapidly (Hellebrandt, 1996), builds networking and communication that enable them learn at their own pace (Moore, 2006), and emboldens them to be more creatice, active and not reliant on the texts (Oxana & Moeller, 2012; Ghavifekr & Rosdy, 2015). Hence, ICT transforms the process of teaching and learning from teacher-centered to student-centered learning (Jan, 217), which has direct impacts on the effectiveness of the pedagogical practices (Ghavifekr & Rosdy, 2015).

The learning paradigm of the 21st centyry leads to the development of students' competence, such as ciritical thinking, communication, collaboration, creative thinking, and innovation (Sharon & Kay, 2010; Ismail, 2017), metacognition, information literacy and ICT, civic (Suto, 2013), and problem solving, which Trilling dan Fadel (2009) coin as creativity and innovation of learning. In addition, the most important aspect of learning that the 21st century learning focuses on is collaboration, one of the most essential objectives of education (Child, 2016), in that it is the key to learning in this century (Ginsburg-Block, 2006). Additionally, collaboration has positive impacts on students' learning and memories (Fall at al., 1997; Saner at al., 1994), and on their capability of applying the knowledge and skills necessary in their social (OECD, 2013). All the aforementioned objectives learning are aimed to attain the ones constructed by UNESCO,

namely "*learning to know, learning to do, learning to be, dan learning to live together*" (Diptoadi, 1999).

Digital infrastructure along with resilient teachers should be promoted in order to successfully operate the teaching and learning based ICT and to attain the intended learning outcomes. Resilient teachers are the ones having strong desire, determination, energy, knowledge and moral strenght (Day & Gu, 2014). Highly competent teachers are of paramount importance in the teaching and learning because teacher quality is the most significant and determining factor for the success of pedagogical practices in the classroom (Rozdi at al., 2016; Blomeke at al., 2016).

Teachers required in the 21st centrury are those who possess the competence, qualification and knowledge about teaching and learning. This is due to the different roles that the teachers recently have, namely teachers as student task designers, facilitators of learning, mentors (Reigeluth, 2017), knowledge mediator, and key person who performs and innovates the process learning (Panev & Barakoska, 2015). Among the demanded competence that the teachers need to acquire nowadays are teaching competence, teachnological competence, professional competence and learning competence (Pineida, 2011).

With regard to the teaching and learning, teachers should master the materials and teach them explicitly and completely through the deployment of various thrilling methods based ICT (Jan, 2017). This pedagogical process is what the students expect from their teachers (Norahmi, 2017). In addition, the teachers should be a role model fo their students inasmuch as the former are not only the mediator, facilitator, and knowledge and skill providers but also models of positive attitudes towards innovation (Kobalia & Garakanidze, 2010).

All countries across the world, including Indonesia, have responded to digitally revitalize their education system. In this regard, the Ministry of Education of Indonesia has made some changes in responding to the proliferating use of ICT, including the overhaul on the curriculum, educational infrastructure, and teacher competence since 2006. However, the question remains whether or not those endeavors have been able to create the teaching and learning process that corresponds to the characteristics of the 21st century? This paper sheds some light on extent to which the teaching and learning process in the primary school context has met the characteristics of the 21st century learning, and the factors affecting it.

CONTEXT AND LITERATURE REVIEW

With current rapid development of ICT use in education, teachers with better technological competence are required. The characterics of the 21st century teachers according to Najir (2014) are those who have competence in the use of technologies, good pedagogical knowledge, general knowledge, positive attitudes, good understanding of curriculum and phsycology of learning. The Indonesia Ministery of Education (2013) stipulates that the 21st century teachers are the ones who have professional, pedagogical, social and personal competences.

In this digital age, teachers remain the determining factors for the process of teaching and learning because they play central roles in the quality of the pedagogical process (Jan, 2017). These teachers with higher levels of intellectual, social and emotional competence will be able to successfully carry out the teaching and learning process because they are more resilient (Day & Gu, 2014).

Brunner (1976) states that among the many competences a teacher oughts to have are being able to design a systematic lesson plan, apply collaborative approach with the students, avoid the use rigid method, and implement collaborative learning methods. Among the many 21st century teaching methods that can be applied is the "inquiry method" (Ginsburg-Block, 2006), *problem-solving* (Wijaya at al., 2016), and question and anwer method (Diptoadi, 1999). To be able to successfully carry out the teaching and learning, a teacher should have some basic competences, namely critical thinking, creativity and innovation (Norahmi, 2017; Tyas, 2017). These basic competences of critical thinking are needed for the teachers to be able to establish smart *social networking* (Boholono, 2017).

What is more, two principles of the 21st century learning that should be capitalized on, namely learning as"generic approach to learning", in which the students seek for and construct their own knowledge (Benade at al., 2014). Teachers only play roles as a mediator of learning (Panev & Barakoska, 2015), facilitator, amd effective guide (Guzey & Roehrig, 2012). Secondly, learning requires "corporating knowledge and doing", where knowledge is learnt and practiced in real world to create meaningful learning. For the same token, Jan (2017) present eight characteristics of the 21st century learning, namely student and individual centered learning, students as producers, project based learning, learning new technologies, go global, smart at using ICT, collaborative and innovative.

Also, Garcia & Morrel (2013) state that the key feature of the 21st century learning is the digitalization of teaching and learning process as technologies remain an important component in the classroom for the teachers to create extraordinary learning (Boholono, 2017). Digital technologies encourage students' participation and collaboration between teachers, and facilitate and guide students' to learn independently as well as afford the

teachers an opportunity to create various creative instructional strategies. Some empirical evidence shows that the use of technologies in learning has the potential to elevate and promote interactive learning (Parvin & Salam, 2015). ICT, according to Peneida (2011), is a powerful tool for the teachers to improve the teaching and learning quality if implemented perfectly. Therefore, the teachers are demanded to be competent in operating ICT and should integrate it into the classroom (Boholono, 2017). Plomp at al. (2009) state that every teacher should be proficient at using ICT in learning, which may indicate the development of the teaching and learning process.

Apart from technologies, some research findings also show that the quality of the teaching and learning is affected by several factors. Blomeke at al. (2016) unveiled three factors affecting the quality of teaching and learning, namely teacher quality, teacher pedagogical experience, and teacher professional development program. Teacher quality is strongly correspondent to two things, such as content mastery and pedagogical competence (Clotfelter, 2007). Additionally, Gustafson & Nilsen (2016) found that students' learning outcomes are determined by two factors, namely teacher education level and professional development, while teachers' experience and self-efficay do not have significant effects on the learning. Theoretically, motivation and students' learning outcomes are influenced by the quality of the teaching and learning, the latter is then determined by the teacher quality, while the teacher quality is determined by their education and teaching experience, professional training program and teacher competence (Scherer & Nilsen, 2016).

METHOD

The Study

This study employed a case study research method, in which the researcher investigated thoroughly certain programs, phenomena, activities, and process or investigated a group of individuals (Creswell, 2009). The current study looked into the process of teaching and learning carried out by primary school teachers, whether or not it has conformed with the characteristics or principles of the 21st century learning, and uncovered the factors affecting the process.

The data pertinent to the pedagogical process are only based on four indicators, namelt learning approach (*teacher center* or *student center learning*), the teaching methods used (oriente to the development of critical thinking, problem solving students' collaboration, and contextuality), the use of instructional technologies, and content mastery (taught clearly and completely).

Source of Data

This case study research garndered the data from 120 elementary school teaachers of 40 primary schools, 20 of which were municipal primary schools, while the other half were peripheral. The primary school teachers becoming the objects of the study were teaching at the third, forth and fifth grade. The details are given in the table beneath:

Table 1: The geographical distribution of data sources

Location	No. of School	No. of Subject	%
Manucipal Primary Schools	20	60	50
Peripheral Primary Schools	20	60	50
Total	40	120	100

Techniques and Instruments of Data collection

The data were garnered through two ways, namely observation and interview. The observation was applied to collect the data from the teaching and learning process performed by the teachers in the class. A minimum of two observations were carried out to collect the intended data. The data collected included the ones regarding the approach, method, and steps of the teachin and learning. In addition, the interview was used to collect the data related to the teachers' understanding students' development, learning method, ICT mastery, and the technological infrastructure owned by the schools.

With regard to the instruments used in collecting the data through observation, structured guideline observation was applied, while semi open-ended question was used to collect the data through interview (Creswell, 2009).

Data Analysis Techniques

The garnered data were analysed using interactive model coined by Miles & Huberman because the data were analysed interactively from the beginning to conclusion. This technique comprises three stages, namelt data reduction, presentation and conclusion or verivication (Miles & Huberman, 1992). The first stage includes the process of selecting, focusing on, simplifying, abstracting, and transcribing the data. Data presentation includes organizing, summarizing, comparing the data with the theories or principles of the 21st century learning, and presenting the data. Data comparison was performed especially for the research question no. 1. Descriptive quantitative was used to present the findings. The final stage of the data analysis was interpreting or concluding the empirical evidence.

FINDINGS

The empirical findings were related to two things, namely the implementation process of teaching and learning in the class, whether it has corresponded to the characteristics of the 21st centyry learning or not. The indicators used to measure this were the instructional approach used (*learner-centered*), instructional method (oriented to the development of critical thinking, problem solving, students' collaboration, and contextualization), the use of ICT in learning, and content mastery of the teachers (taught explicitly and completely). Secondly, what factors affected the teaching and learning process.

Berdasarkan indikator-indikator di atas diketahui bahwa proses belajar mengajar di sekolah dasar tergambar dalam tabel di bawah;

Tabel 2: Implementasi pembelajaran di kelas

No	Aspek	Yes		No	
		f	%	*f*	%
1	the instructional approach used (*learner-centered*)	7	5.83	113	94.17
2	instructional method (oriented to the development of critical thinking, problem solving, students' collaboration, and contextualization)	49	40.83	71	59.17
3	The use of ICT in learning	0	0	120	100
4	Content mastery (explicit and complete)	114	95	6	5

The table above portrays that 94.17% of the primary school teachers carried out the process of teaching and learning with *teacher-center learning*, while only 5.83% of who deployed *student-center learning approach*. With respect to the instructionl method, 59.17% of the techers used conventional methods, while 40.83% of them employed the methods oriented towards the development of high order thinking. This includes the use of question and answer inquiry approach, role plya, and experiment. The answer and question method used was one-way method from the teachers to the students. Regarding the use of ICT in learning, none of these teachers in the study made use of existing technologies in teahing. On the other hand, 95% of the teachers acquired the content and explicitly and completely taught to the students.

With regard to the factors affecting the process of teaching and learning that conform to the characteristics of the 21st century learning perfomed by the teachers can be seen in the following table:

Table 3. Factors affecting the teaching and learning process that corresponds to the characteristics of the 21st century learning.

NO	Influencial Faktors	Yes		No	
		f	%	*f*	%
1	Teachers' knowledge about the various teaching methods	60	50	60	50
2	Teachers' understanding about the students' development	56	46.67	64	53.33
3	Teachers' ability to operate the ICT (laptop and LCD)	12	10	108	90
4	The availability of the ICT infrasturture at schools (laptop, LCD, and internet access)	1	2.5	39	97.5

The table shows that 50% of the primary school teachers possessed adequate knowledge about the teaching methods, while half of them were less likely to have sufficient knowledge in the domain. With regard to their understanding of the students' development, 53.33% of the teachers did not have adequate understanding about it, while 46.67% of who were otherwise. Regarding the ability to use ICT (leptop and LCD), 90% of these teachers were not competent enough in operating ICT, and only 10% were proficient enough. It can also be seen that 97.5% of the schools did not have ICT infructure, while 2.5% of them were completed with it.

DISCUSSION

The finding showing the prevalent use of teacher-centered learning and conventional teaching methods, such as lecturing and assignment performed by the majority of the teachers indicates that the teaching and learning process they carried out has not yet conformed with the 21st century learning. This finding corresponds to the study conducted by Diptoadi (1999) who unveiled that the education in Indonesia focuses more on memorization excluding the context. Theoretically, the 21st century leraning is student-centered learning (Hashim, 2014), which stresses on the use of collaborative learning for the students to construct their own knowdlege independely through various resources (Wijaya, 2016). Collabration in the 21st century is an important education outcome more than just knowdledge (Child, 2016). This is due to its affordance for the development of the students' knowledge and skills in real life, and is very crucial in the future work (OECD, 2013).

Drawing on various research findings, half of the teachers in this should ideally be able to carry out the process of teaching and learning that centers on the studens and the development of their higher order thingking skills (HOT) because this study shows that half the teachers had sufficient understanding about the use of various teaching and

learning methods. Arend (2001) opines that teachers who are able to create effective and meaningful learning and to encourage learning, and manage it independently are those understand and deploy various precise teaching and learning strategies. A study conducted by Blomeke, at al. (2016) on PISA dat involving 47 countries also unveiled that the pedagogical competence of the teachers were significantly correspondent to the quality of teaching and learning process and students' learning outcomes. The teachers who have adequate pedagogical skills can promote the quality of the teaching and learning process and improve students' learning outcomes. This is because the learning quality is a variable that directly corresponds to the students' academic achievements (Scherer dan Nilsen, 2016).

The use of incompatible approach and methods with the characteristics of the 21st centyry learning is caused by the lack of understanding of the teachers about the students' development. The current study evidenced that more than half of the teachers do not have a good undertasing about the cognitive, social and morale development of their students. This may adeversely impact on the missuse of teaching approach and methods. Slavin (2000) and Sagala (2009) advocate that it is incumbent on the teachers to understand the charactersitics of their students in order to be able to choose appropriate materials and teaching methods that corresponds to the development, experience, and need of the students.

In addition, one of the characteristics of teachin and learnin in the 21st century is the integtration of technologies into the classroom. Technologies are the key instrument to boost the quality standard of students' learning (Jan, 2017). With technologies, the students can access a wide array of information anywhere at anytime at their own pace and can create meaningful learning activities (Hellebrandt, 1996). Due to its crucial role, the technological infrastructure should be available at every school, and each teacher should have necessary skills to operate them. However, this study found that non of the teachers in the study employed ICT in the teaching and learning process. This is because the schools do not have adequate digital infrastructure, such as laptop, LCD, and internet access. Likewise, the majority of the primary school teachers are not proficient in the operation of technologies (laptop, LCD). This empirical evidence demonstrates that the pedagogical practices at the primary school level do not feature the 21st century learning. Such a condition, of course, adversely impacts on the quality of the teaching and learning process and the students' learning outcomes given other empirical evidence enscapsulating the correlation between the use of ICT and the quality of the teaching and learning process and students' academic attainments (Levy, 2009; Oxana dan Meller, 2012; Ghavifekr & Rosdy, 2015).

Despite this, the process of teaching and learning at the primary school has some strenghs, namely the explicit and complete instruction. This shows that the teachers acquire the subjects being taught, which may become the main capital to create a high quality learning environment. The mastery of the learnin materials for the teachers, according to Slavin (2000), is tremendously important because this is one of the characteristics of good teachers. In additon, content mastery has been found to correlate significantly to the students' learning outcomes. If the teachers have adequate content mastery, the students' academic achievements will be better (Blomeke, 2016).

CONCLUSION AND RECOMMENDATION

This study encapsulates that the teaching and learning process in the primary school level does not correspond to the key features of the twenty first century learning. It does not represent the real practice of the current pedadogical practices. The factors affecting this phenomenon is the lack of teachers' competence in operating ICT, the absence of technological infrastructure at the schools, inadequate knowledge of the teachers about various teaching methods, and their lack of understanding on the students' learning development and the ideal instruction that conforms with the students' learning development needs.

The empirical findings show the less if not absence of the state's intervention in promoting the development of digitalized education and low teachers' capacity in carrying out the instructional practices suitable for the 21st century learning. For this reason, it is of paramount importance for the government to revitalize the education sector, particularly on primary school level through the development of digital infrastructure and teachers' pedagogical and teachnological competence, which can be catered through a structured teacher professional development program.

Because this study is a case study in nature, which may lack a rigour in terms of the data collection as it relies on a few classroom observations, future research may look at more complex issues using quantitative or more in-depth qualitative study, such as ethnography, correlational survey research, that look into the teaching and learning practices of the primary school teachers over a period of time. Another study may also be essential to carry out in a different education level, such as secondary or university levels.

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